



Pertanika Journal of
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& HUMANITIES

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A Special Issue devoted to
Bridging Disciplines to Tackle Contemporary Societal Challenges

Guest Editors
Mohamad Fazli Sabri and Hanina Halimatusaadiah Hamsan



A scientific journal published by Universiti Putra Malaysia Press

PERTANIKA JOURNAL OF SOCIAL SCIENCES & HUMANITIES

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Pertanika Journal of Social Sciences & Humanities currently publishes 6 issues a year (*March, April, June, September, October and December*) periodical that considers for publication original articles as per its scope. The journal publishes in **English** as well as in **Bahasa Melayu** and it is open for submission by authors from all over the world.

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Preface

The social sciences and humanities continue to play a pivotal role in understanding the complexities of human behaviour, societal transformation, and cultural dynamics in an increasingly interconnected world. Rapid socio-economic changes, technological advancements, and evolving demographic patterns have intensified the need for research that addresses contemporary social challenges while promoting inclusive and sustainable development. This special issue brings together scholarly contributions that examine pressing issues within diverse social contexts, offering insights that are both theoretically grounded and practically relevant.

As societies navigate challenges such as economic inequality, mental well-being, family dynamics, and youth development, there is a growing emphasis on interdisciplinary approaches that integrate psychological, sociological, and behavioural perspectives. The studies featured in this issue highlight the importance of resilience, adaptive coping mechanisms, and social support systems in addressing these challenges. Collectively, they contribute to a deeper understanding of how individuals and communities respond to adversity and change.

This special issue focuses on recent developments in social sciences and humanities research, particularly within the Malaysian and regional context. It covers a wide range of topics, including but not limited to:

- Socioeconomic challenges and resilience among vulnerable populations
- Mental health, well-being, and coping strategies
- Youth behaviour, risk factors, and social influences
- Family dynamics and developmental outcomes
- Cultural and community-based interventions

The contributions in this issue aim to advance scholarly discourse while informing policy and practice. It is hoped that the insights presented will serve as valuable references for researchers, practitioners, and policymakers committed to fostering inclusive, resilient, and sustainable societies.

Guest Editors

Mohamad Fazli Sabri (Prof. Dr.)

Hanina Halimatusaadiah Hamsan (Assoc Prof. Dr.)

Strength in Scarcity: A Diary-interview Study on the Lived Experiences of Malay Urban Low-income Working Mothers in Klang Valley, Malaysia

Najwa Baharuddin^{1*}, Nik Ahmad Sufian Burhan¹, Ruhaya Hussin², Azlin Tajuddin³, Farha Alia Mokhtar⁴, Misrah Mohamed⁵, and Wan Naszeerah⁶

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ABSTRACT

This study explores how low-income working mothers in urban Malaysia nurture personal and spiritual growth amid economic and caregiving challenges. Using the Interpretative Phenomenological Analysis (IPA), the research draws on diary narratives and in-depth interviews with eight participants to uncover their lived experiences. Findings showed that the mothers actively fostered personal development through spiritual and/or religious engagement, knowledge acquisition, and gratitude practices. They displayed great character traits like perseverance, optimism, and self-efficacy in the face of ongoing hardships. However, because not all participants found relief from practising gratitude, the study also emphasises the emotional complexity of this practice. These insights offer a more nuanced understanding of coping strategies among low-income working mothers and emphasise the importance of psychological and spiritual resources. The study calls for strength-based and culturally sensitive interventions to enhance the well-being of these women. Supporting their well-being is crucial not only for improving

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their quality of life but also for enabling their sustained participation in the workforce, ultimately contributing to an increase in the female labour force participation rate.

Keywords: Coping strategies, female labour force participation, interpretative phenomenological analysis, low-income working mothers, urban population

INTRODUCTION

The participation of women in the labour force plays a critical role in driving economic growth and promoting social equity (UN Women, 2023). Economists have long emphasised that when women engage in paid employment, they not only contribute to national productivity but also increase their bargaining power within households (Winkler, 2022). As a result, it will lead to a significant enhancement of their economic value, both within the family unit and across broader societal structures (UN Women, 2023; Winkler, 2022). In Malaysia, addressing the female labour force participation rate (FLFPR) is a priority outlined in the 12th Malaysia Plan (12MP) 2021-2025 (Economic Planning Unit, 2021).

However, for low-income working mothers, the realisation of paid employment is often hindered by systemic inequalities (Dodson, 2013). Many navigate a precarious balancing act involving constrained financial resources (Chen et al., 2017), demanding caregiving responsibilities (Ervin et al., 2022; Kida et al., 2023; Sharma et al., 2016), and insecure employment within systems that are frequently ill-equipped to provide the structural support required for sustainable well-being (Dodson, 2013). Financial security is determined not only by access to resources but also by their

effective management, as daily spending and saving decisions can have a significant impact on long-term stability (Sabri et al., 2022a, 2023). Positive financial behaviours, influenced by financial literacy, socialisation, values, gender, and personality traits, have been found to improve well-being and resilience in Malaysia, particularly among female-headed households (Burhan et al., 2022; Khalisharani et al., 2022; Sabri et al., 2021a, 2021b, 2022b;). This concern aligns closely with United Nation's Sustainable Development Goal 5 (SDG 5 Gender Equality), which calls for the recognition of unpaid care work, the promotion of women's full participation in the economy, and equal access to leadership and decision-making opportunities (United Nations, 2025).

Indeed, existing literature on low-income women has contributed significantly to our understanding of their socio-economic vulnerabilities (Puteh & Kadir, 2022), including limited access to essential services such as quality child care (Clark et al., 2021; Kowalewska & Vitali, 2021), and the psychological toll of persistent gender inequality both at work and at home (Christopher, 2012; Lamar et al., 2019; Lamar & Forbes, 2020). However, there is a discernible gap in the research when it comes to exploring these working women's active strategies such as how they adapt,

negotiate, and draw upon internal and relational strengths to survive and thrive. Much of the current discourse tends to present them through a deficit lens, often neglecting the agentic ways they respond to their circumstances. In addition, the dichotomy often drawn between economic challenges (Berkman et al., 2014) and psychological resources (Atal & Cheng, 2016) overlooks the interconnectedness of these domains in everyday lived experience.

Theoretical perspectives on stress and coping offer useful tools for examining this intersection. Lazarus and Folkman (1984) defined coping as “the constantly changing cognitive and behavioural efforts to manage specific external and internal demands that are appraised as taxing or exceeding the resources of the person” (p. 141). Their transactional stress model emphasises the dynamic interplay between individuals and their environments, foregrounding how personal and contextual factors shape coping processes. Importantly, they acknowledged the central role of personal and social resources in determining one’s capacity to appraise and respond to stress. Building on this, Hobfoll’s (2002) The conservation of resources theory further posits that individuals strive to obtain, retain, and protect resources, and that stress arises when these resources are threatened, lost, or insufficient to meet environmental demands. These two models demonstrated how an individual's resource base, which includes psychological, relationship, and spiritual assets, influences stressor perception and coping strategies (Hobfoll et al., 2018).

Hobfoll (2002) defines resources as intrinsically valuable, such as internal peace or pride, or useful for achieving desired goals, such as financial means or social support. Individual personality traits like self-efficacy, optimism, and goal-directedness are critical for developing resilience. Recent research has expanded on this perspective, discovering that individuals' proactivity, reflexivity, and hope are critical for adapting to and growing in difficult situations (Contreras et al., 2020; Kerksieck et al., 2019). These internal resources improve people's coping abilities and give them a greater sense of agency, thereby increasing their overall ability to cope effectively (Abdullah & Wider, 2022; Hobfoll, 2002; Hobfoll et al., 2003).

Furthermore, resilience is typically defined in modern discourse using two perspectives that complement one another. The first emphasised the ability to recover and function normally after experiencing adversity, while the second emphasised the proactive aspect of personal development. As a result, individuals not only overcome challenges, but also emerge with increased psychological well-being and capacity (Métais et al., 2022). Core features of resilience include adaptability, self-confidence, a solid sense of self-worth, and the use of effective coping mechanisms (Braveman et al., 2011). Individuals with higher levels of resilience tend to experience reduced stress, lower incidences of depression, and fewer physical symptoms in response to life stressors (Ryan et al., 2005).

In situations where direct action is limited, emotion-focussed coping has been found effective (Folkman et al., 1986) where religious and spiritual coping strategies are prominent within this domain (Zainal-Abidin et al., 2022). While religiosity and spirituality are conceptually distinct, they share a common feature: the pursuit of the sacred human efforts directed toward meaningful goals and ultimate concerns (Hill & Edwards, 2013). These constructs often overlap but are not identical (Krok, 2015). As a result, researchers frequently identified them as complementary constructs such as in the context of personality and mental health (Beit-Hallahmi, 2015; Gall & Guirguis-Younger, 2013).

Religion generally encompasses beliefs, practices, and rituals centered on transcendence, such as belief in God, Allah, Buddha, or a Higher Power (Tuczyńska, et al., 2022). Religious systems typically express specific doctrines about the afterlife and ethical behaviour within a social context, rooted in sacred texts, faith traditions, and moral norms (Tuczyńska, et al., 2022; Wang et al., 2023). Even though it is sometimes practiced within an organised religion, spirituality is associated with mystical, supernatural, individual transcendent experiences (Koenig, 2012; Lavorato Neto et al., 2018). Such experience includes both the experiential discovery of meaning and purpose that are superior to oneself and the pursuit of them.

Recent research has shown that spirituality and faith can be the sources of strength, particularly for those going through

difficult times. For example, Dipierro et al. (2018) discovered that people who engage in spiritual practice can increase hope while decreasing anxiety. Along the same lines, Smeraldo Schell and Silva (2020) emphasised that the difficulties faced by working women are critical for triggering growth in them, provided that these difficulties are supported by faith. Spiritual community is important in helping them develop resilience and a strong identity, which provides both emotional and practical support.

Khamis et al. (2023) investigated the effectiveness of cultural and educational programmes in empowering marginalised mothers. In their study of Arab American parents, they discovered that initiatives based on their own culture and beliefs strengthened their faith and resilience and increased their sense of belonging among mothers, because these programmes connected them with their own family tradition, which channeled into increased emotion and spirituality. Furthermore, Chung's (2017) study on the role of practical theology in daily life discovered that Korean women who have successfully integrated faith into their daily routine have increased emotional strength and a sense of purpose in life. This evidence demonstrates that spirituality and mental health work together to promote healing and personal growth.

However, there is still a scarcity of research on urban low-income working mothers facing life challenges. Specifically, there is a lack of understanding about the use of personal resources and spiritual

support for well-being and development. The scarcity of phenomenological studies has created a barrier to understanding how marginalised groups maintain agency in an environment marked by constant challenges and rising living costs. As a result, it is critical to investigate internal perspectives to understand how these mothers interpret their experiences (Conrad, 1987).

The purpose of this study is to investigate the lived experiences of low-income working mothers in urban areas of Malaysia using the Interpretative Phenomenological Analysis (IPA). Through the combined use of diary narratives and in-depth interviews, this research seeks to understand how these women manage their scarce resources and cope with ongoing stressors. The study offers insights that support the advancement of UN's SDG 5 Gender Equality and FLFPR through socially and culturally informed policies and interventions that reflect the realities of women's lives on the ground.

METHODS

Interpretative Phenomenological Analysis (IPA)

IPA made its first debut in mid-1990s where Jonathan Smith who pioneered the methodology, argued for an experiential and qualitative approach that is born from and centred in the discipline of psychology itself, without borrowing from other disciplines (Smith et al., 2022). IPA is a systematic exploration of human experience, examined in its own terms without the influence of prior psychological constructs or the researchers' own proclivities (Smith, 2017; Tomkins,

2017). It is a set of methodologies that has been informed by three main areas of the philosophy of knowledge: phenomenology, hermeneutics, and ideography (Larkin et al., 2006). These three components are central to IPA study as it will steer the researcher to probe participants with questions within the IPA's theoretical orientation (Noon, 2018).

Phenomenology

Phenomenology explores human experience from a first-person perspective and emphasises direct investigation of lived experiences without reliance on existing theoretical frameworks (Ashworth, 2015; Smith & Nizza, 2021). IPA draws significantly on phenomenological philosophers like Husserl, Heidegger, Merleau-Ponty, and Sartre. Husserl's principle of "going back to the things themselves" underscores phenomenology's focus on intentional consciousness and experiential reflection (Smith et al., 2022). Unlike Husserl's approach of self-description, IPA extends to understanding others' experiences by integrating phenomenology with hermeneutics to interpret experiences within their specific social and historical contexts (Larkin & Thompson, 2011).

Hermeneutics

Hermeneutics is IPA's second theoretical foundation and is concerned with interpretation, particularly how individuals make sense of their experiences (Smith & Nizza, 2021; Tuffour, 2017). Heidegger emphasises the subjective and interpretive nature of phenomenology and introduced

the double hermeneutic, where researchers interpret participants' interpretations of their experiences (Smith & Osborn, 2015). Heidegger also highlighted the importance of recognising researchers' preconceptions. He urged a continuous effort to bracket one's preconceived thoughts to let phenomena emerge naturally (Smith et al., 2022). This aligns closely with reflexive practices in qualitative research (Finlay & Gough, 2003).

Idiography

The third pillar of IPA, which is ideography, involves a detailed exploration of individual experiences. This contrasts with nomothetic approaches that aim for generalisations (Smith et al., 2022). IPA's idiographic focus provides rich insights by thoroughly analysing each participant's unique perspective and the intricate relationships among their thoughts, emotions, and actions (Smith & Eatough, 2007). This approach underscores IPA's commitment to exploring deeply personal and context-specific experiences (Tuffour, 2017).

Research Design

This study employed a combination of a seven-day semi-structured diary study followed by semi-structured interviews. These methods are recommended for effectively capturing lived experiences in IPA research (Cudjoe, 2022; Smith et al., 2022). Diaries were semi-structured with minimal open-ended prompts to encourage expressive writing. Participants must write at least 250 words daily. Follow-up

semi-structured interviews complemented the diary entries by providing deeper insights and clarifying experiences where participants may not fully express in writing alone. Interviews were flexible, conversational, and participant-driven to align with IPA's focus on capturing nuanced personal insights (Smith & Eatough, 2007).

Sampling and Recruitment

Following ethical approval from IIUM (IREC 2019 235), participants were recruited via social media adverts and snowball sampling. The inclusion criteria are household income \leq RM4000/month, full-time employment, living in Klang Valley, having caregiving responsibilities, and no prior mental illness history. The study was conducted on a homogenous sample of eight working mothers. The participants were selected purposively to focus on homogeneity relevant to the phenomenon under study. Homogeneity was defined based on their roles as urban low-income working mothers and primary caregivers, rather than marital status. The small sample size ensured the sample's relevance and depth of insights for the IPA approach (Smith & Osborn, 2015). Table 1 shows the demographic profile of the participants.

Data Collection

Diary Procedure

The diary study was conducted from June to July 2021. Participants began recording at the start of their work week and

Table 1
Participant demographic data

Pseudo-nym	Age	Race*	Religion	Relationship Status	Occupation	Number of Children	Special Needs Child	Parents as Dependent
Anom	43	M	Islam	Married	Storekeeper	2	No	No
Dara	28	M	Islam	Married	Customer service agent	3	No	No
Embun	33	M	Islam	Divorced	Front desk officer	1	No	Yes
Seroja	30	M	Islam	Married	Marketing executive	1	No	No
Melor	28	M	Islam	Married	Admin officer	1	No	No
Orked	42	M	Islam	Married	Private school teacher	3	No	No
Suri	44	M	Islam	Divorced	Admin officer	5	No	No
Kia	42	M	Islam	Divorced	Clerk	2	Second child is autistic	No

*M=Malay

continued daily for seven consecutive days to include both weekdays and weekends. They completed entries each evening by reflecting on significant daily events. To ensure clarity and relevance, participants received thorough explanations of each diary component during the initial briefing to enhance the richness of their narrative responses.

Interview Procedure

Interviews were conducted individually via Zoom from November to December 2021, which lasted between 60 and 120 minutes. All sessions were video recorded. Each interview was tailored specifically to participants' diary entries, which were guided by preliminary IPA analysis of their diary narratives. Customised interview guides were created based on key diary

insights. This guide serves as a flexible framework, not a rigid transcript. The format is appropriate for the method proposed by Elliott and Timulak (2005). Recordings were transcribed verbatim, including nonverbal cues, and saved under participants' pseudonyms.

Data Analysis

Both diaries and interviews in this study were analysed using Smith et al.'s (2022) IPA seven-step methodology. This analysis entails reading, taking exploratory notes, creating experiential statements, continuing to analyse other cases, and using personal experiential themes (PETs) to develop group experiential themes (GETs). Diaries were the first thing analysed to gain a better understanding of working mothers' lives. These diaries were created as a

series of personalised interview guides, and the interviews were then analysed. The analysis concentrated on the depth of interpretation, the ideographic approach, and the triangulation of diary entries, interview transcripts, and researcher notes.

Data Triangulation

This study used diary entries, interview transcripts, and researcher field notes to conduct triangulation, which is critical in qualitative research (Fusch et al. 2018). Field notes captured critical information such as participant utterances, keywords, and notable interactions, such as family interruptions during the interview session, indicating a lack of personal space for mothers to speak. To ensure a more in-depth and clear analysis, the researcher writes about the mother's thoughts on personal bias and performance immediately following the interview.

These three sources were compared iteratively. For instance, when a potential theme such as personal spiritual growth appeared in diary narratives, it was cross-checked in subsequent interview analysis and substantiated by field notes that captured moments where participants became visibly emotional when speaking about relying on faith during hardship.

Where diary and interview accounts diverged, these differences were treated as analytically meaningful and interpreted within participants' evolving sense-making rather than as inconsistencies. Such differences were viewed as reflecting shifts in perspective, emotional processing, and reflexivity over time. Diaries captured

participants' immediate lived experience, while interviews enabled reflective (re) interpretation.

RESULTS AND DISCUSSION

This section analyses the Group Experiential Theme (GET): Committed to Nurturing Self-Growth and its two accompanying subthemes, using the most important quotes from participants.

Group Experiential Theme: Committed to Nurturing Self-growth

Amidst the trials and tribulations of their circumstances, low-income working mothers exhibited an unyielding determination to evolve. These mothers do not merely view challenges as obstacles but as opportunities for growth. Through their stories, they strove to break free from the constraints of their economic status and drew strength from the belief in self-improvement to thrive. All these underscore the valuable role of strong personality traits that positively shape the way the mother responds to challenges.

Sub-theme 1: Cultivating Personal and Spiritual Development

Orked was very determined to strengthen her connection with Allah SWT by diligently practising religious deeds such as praying on time, doing *zikr*, reciting Qur'an, and performing *tahajjud* of which practices she hardly did before the pandemic hit. She believed that by engaging in those practices will bring her closer to *Allah SWT* of Whom the ultimate strength for her to push competently through her arduous life came.

I am determined to change. I want to improve myself. I want to get closer to The Creator, The God of The Entire Universe. I am determined to recite the Quran every day, doing zikr and send selawat so I can get more strength to face my life every day. (Orked, diary day 2/52)

Orked's determination to connect with *Allah SWT* was apparent when she continuously penned down her religious deeds throughout her diary narratives. She would invoke Allah's beautiful names and attributes as a symbolic way to instill the value of *tawakkul* or reliance in *Allah SWT* as the One who is in control of her affairs. Orked also engaged deeply in self-reflection and connect that with *Allah SWT*'s generosity.

Allah SWT is the All Knowing. The All Hearing of His slaves' pleas. I was just thinking the other day about which budget I can use to buy my kid's milk and milk bottles. *Allah SWT* granted me with *rizq* (provision) that I didn't expect. "Then which of the favors of your Lord will you deny?" (Surah Ar Rahman). (Orked, diary day 6/line 29)

In another diary entry, Orked's narrative reflects her strong commitment to self-improvement and personal growth. She was listening to a motivational live sharing by Mommy Hana company, where she earned her supplementary income from selling educational children's products.

Orked found the discussion to be both interesting and beneficial, which indicates her appreciation for opportunities to gain new knowledge and insights, especially in areas that are relevant to her own personal growth.

Her reflection on feeling "small" and recognising her own flaws suggests that the discussion has had a profound impact on her self-perception. She may have become aware of areas in her life where she can improve or where she falls short, which is a crucial step toward personal growth. Further, Orked expressed a strong desire to grow and improve as a person. Her use of the phrase "*Aamiin Ya Rabbal A'lamin*" indicates a prayerful and sincere aspiration for self-improvement. She sees this knowledge-sharing session as a catalyst for positive change in her life.

Tonight I'm writing while listening to live stream from Mommy Hana. The discussion topic for tonight is very touching that is about the sacrifice of a mother. It's very interesting, a very beneficial knowledge sharing session. It makes me feel so small and made me realised my flaws. I'm hopeful that the sharing tonight can make me to become a better person. *Aamiin Ya Rabbal A'lamin*. (Orked, diary day 4/line 1)

Kia's diary entries revealed her strong desire for education and knowledge despite being deprived of resources. Kia authored impactful narratives on her perception of her family as low-income, which is a status often stigmatised with associations of

limited educational attainment and negative attitudes. Kia expressed her commitment to investing in books and education despite financial constraints. She did not want herself or her children to lack knowledge or intelligence because of their economic situation. This suggests that she values education to overcome adversity and believes in the power of learning to improve her life. She wrote in her diaries:

I spend a lot on books too. I don't want to be stupid. I don't want my kids to be stupid even though we are poor. (Kia, diary day 2/line 124)

Kia emphasised her determination to protect her children from feeling inferior or being demeaned due to their economic status. She believes that acquiring knowledge and building confidence is a way to empower themselves and gain an advantage in life. On top of that, Kia sees education as an avenue to break the cycle of poverty and give her family opportunities for a better future. In another diary narration, Kia wrote:

I fought all odds to make sure they were never belittled and made sure we had an upper hand. Knowledge and confidence is power. (Diary, day 1/line 44)

Highly committed to self-improvement, she also gained knowledge from being an avid listener to podcasts, talk shows and motivational shows on her way to work which she stated to have boosted her self-confidence and social skills. Kia's reference to various talk shows and podcasts, including those that may disagree with

women, indicates that she values exposure to different viewpoints and opinions. She is open to hearing perspectives that challenge her own, which reflect a commitment to intellectual growth and critical thinking. She recognised that listening to these podcasts has practical benefits for her, including improving her communication skills and helping her with her work. Kia's dedication to listening to podcasts reflects her commitment to personal and professional growth, her openness to diverse perspectives and her recognition of the practical benefits of this habit, particularly in terms of communication and presentation skills. As a result, being knowledgeable made her feel empowered to thrive as a breadwinner from a low-income household.

On the way to work, I have to listen to one talk show. So last time it was Ellen, then it was Jordan Petterson. It was all this talk show, talk show, talk show, all the podcast, podcast including the one that disagrees with the women [...] All from the Western countries. Why? Because we don't want to be like that. But it help me with my communication. Because they help me with my works, with what I want and how to put it in proper, what Jordan Petterson say aa, you must know how to present what you want properly. (Kia, interview/transcript 1, line 1459)

Seroja and Anom both thrived by viewing challenges at work as an opportunity for growth. For Seroja, she was driven by the sense of achievement and success hence

she would make sure to perform greatly at any given roles. This mindset reflects her commitment to personal and professional development. It emphasises the value of acquiring new skills and accomplishing challenging goals. Therefore, having this optimistic mindset steers her to not easily give up when facing adversities.

If I like something, I will do it. But even when I work as the Marketing Executive.. it's not something I like to do but I feel like if I can achieve.. especially when I don't have any experience.. that will be something like a big achievement.. (Seroja, interview/line 1085)

Anom resonates Seroja's buoyant character when it comes to work-related strains as she perceived heavy workload as a challenge to further improve herself. Anom conveyed a deep sense of responsibility and commitment to her job which she viewed as essential for their livelihood. Her willingness to adapt to changing responsibilities and her motivation to excel in their role demonstrate a strong work ethic and a desire to contribute significantly to her workplace. Interestingly for Anom, she was motivated to give more to her job also because she held firm to the belief that her job was her source of *rizq*, which means she should not take the responsibilities lightly as *rizq* ultimately came from *Allah SWT*.

I have to wait for the lorry. Sometimes they came in late so I will stay until 6pm. Even on Saturday I will stay until 3pm. Ahh.. it depends.. depends on

the responsibilities at hand. It's very important (laugh) for me to take care of.. because our job is where we get our *rizq* from. So I don't mind given lots of work to do.. I feel like.. hm.. they gave me that position I have to challenge myself and give more than that. (Anom, interview/line 570)

This analysis highlights the significance of character strengths as delineated by Seligman et al. (2005) and McGrath (2023). It reflects how low-income working mothers navigated ongoing hardship. Participants demonstrated intellectual strength, curiosity, perseverance, and courage through continuous learning, self-reflection, and intentional efforts toward self-improvement. These practices were not merely aspirational but functioned as adaptive coping strategies that enabled the mothers to maintain a sense of agency and dignity amid structural constraints. Engagement in learning and personal development appeared to foster a sense of self-efficacy. In line with Hobfoll's (2002) conservation of resources framework, participants seemed better able to manage daily stressors and sustain psychological resources over time. Within this context, character strengths operated as internally cultivated resources that supported psychological adaptation rather than as indicators of unproblematic resilience.

Sub-theme 2: Practising Gratitude and Emotional Coping

These working mothers demonstrated a strong sense of gratitude and a positive

attitude by emphasising the importance of appreciating their blessings. They realised that the blessings bestowed upon them, no matter how small, can give them strength and happiness. This perspective allows them to seek relief and satisfaction when confronted with challenges. Suri's empowered mindset is evident in her refusal to give up on difficult challenges in her life. When she mentioned, "Always believe that happiness is to be created," it conveys that she was actively pursuing positivity during her struggle as a low-income single mother of five.

Always believe that happiness is to be created. That's how we set our mind to be positive.. so I don't continuously feeling down. Of course, to think deeply.. our lives are filled with tests.. since the divorce, I have to make lots of work to survive.. doing all sorts of things to stay relevant.. small income.. I feel embarrassed when compared to my friends from school or uni. When I'm aware that my test is from the financial side.. what I have to do is to be grateful of other things.. my kids are healthy is one blessing.. my kids enjoy memorizing the Qur'an.. even more of a bigger blessing.. my kids are less problematic.. also a huge blessing.. my neighbours are kind.. also a big blessing. My friends are always helping and caring. Isn't it perfect? So which one of the favours to deny? Maybe the downside is when their children's father is not living with us and that my career is not as good as my friends.. but that's

very little (compared to her blessings) [...] more gratitude, less complaints, count your blessing.. always. Only then we'll feel the relief. (Suri, diary day 4/ line 26)

Anom echoes Suri's deep reflection of her life trajectory that eventually brought her back to a deep sense of gratitude towards the provisions that she has now as opposed to what she has not. Having gratitude gave her the clarity to differentiate between her needs and wants which often unaccomplished due to financial constraints.

At the end, I don't want to think so much about buying a house. For me, if my rizq says that it's just renting for me then what can I do? This is comfortable too. I have it all. Enough food, clothes.. Alhamdulillah.. it's fine. We.. we want a luxurious life. When we see others are driving that car and this car. But when.. we want all that. What's that for? It's like.. they have their target and we have our targets [...] For me.. I aimed to buy a house but I also don't want to force myself to it. (Anom, interview/ line 1309)

This finding corroborates with existing research that shows gratitude can have a significant impact on individuals' mental health and well-being, where it positively influences their ability to cope with adversity (Taylor et al., 2022; Wood et al., 2010). Specifically, the narratives of the participants captured the gratitude trait as conceptualised by Wood et al. (2010). They showed gratitude in ways

such as verbalising, focusing on what they have, frequent feelings of awe and enjoying the present moment. They were also committed to nurture gratitude as part of their lifestyle. Seligman et al. (2002) describes 'transcendence' which consists of 'appreciation of beauty and silence', 'gratitude' and 'hope' among others as part of the strength-based traits a person can possess. However, Wood et al. (2010) contended that gratitude should be considered a life orientation distinct from other emotions like optimism, hope, and trust.

Yet, there was also a glimpse at the complexity of gratitude as a coping mechanism as some mothers grappled with its effectiveness in alleviating emotional distress. It is fascinating to see how some participants felt discouraged despite having practised gratitude. Dara and Seroja both expressed feelings of emptiness and disappointment, despite their efforts to focus on what is important to them. This demonstrates that emotional complexity and potential causes extend beyond undesirable outcomes. It implies that these young mothers might have certain expectations about what gratitude should bring them. Perhaps they assumed that simply being aware of their blessings can give them significant emotional relief or life satisfaction. When those expectations were not met, they felt even more perplexed and at loss for solutions.

In the thick of the constantly pressuring work-life predicaments, Dara narrated a high sense of self-blame when she failed to force herself to feel better by being grateful

for having family around her. This kind of maladaptive spiritual coping further pushed Dara to feel downhearted and obstructed in improving her troubled life situation.

I always remind myself that I have three most beautiful kids, I have a husband, my parents and my siblings. What else is lacking? Why do I still feel empty? (Dara, diary day 5, line 25)

The same circumstance was depicted in Seroja's diary narration:

Today is no better than yesterday. I should be grateful to have a roof for shelter and I am still breathing.. but I don't know why I still feel really empty.. just empty. (Seroja, diary day 2/line 1)

The reactions of Dara and Seroja point towards the practice of gratitude as maladaptive to them. As such, not all individuals will have the same cathartic outcomes from gratitude practices, and what may be maladaptive for one person might be adaptive for another. Indeed, existing studies suggest that gratitude alone may not offer adequate protection against maladaptation in the context of prolonged stress or traumatic experiences (Krause, 2009). This could be due to the association between greater adversity accumulation and heightened depressive symptoms, which consequently leads to diminished life satisfaction (Infurna et al., 2023). As a result, the challenges and difficulties individuals encounter might surpass the support provided by gratitude alone. Thus, there appear to be constraints

on gratitude's stress-reducing abilities, with its beneficial impacts being overshadowed by highly stressful life events.

CONCLUSION

The themes highlight the resilience demonstrated by low-income working mothers in their pursuit of personal and professional advancement. Rather than viewing economic hardship and life challenges as impassable obstacles, these women saw them as opportunities for self-improvement and personal development. Their stories revealed the magical role of religion and spirituality in coping, the importance of gratitude, and, most importantly, the promotion of optimistic and positive attitudes toward life.

These findings have drawn attention to the internal strength gained by these mothers, specifically optimism, goal-directed behaviour, and self-esteem. They actively used these personal resources to advance their personal and professional development. These insights revealed not only their tenacity, but also their astute strategy for dealing with adversity. These coping strategies provide useful guidance for designing more effective support interventions.

Importantly, this study's analysis suggests that designated programmes to assist low-income working mothers should go beyond simply overcoming obstacles. In contrast, they should be given more time to identify and develop their character strengths. These women's life experiences remind us that, while

overcoming weaknesses can help prevent failure, purposeful cultivation of strength serves as a foundation for long-term growth among low-income working mothers.

Implications of the Study

The study's findings have significant implications for both research and practice. First, they challenge deficit-based narratives about low-income working mothers by demonstrating how these women actively cultivate personal resources and spirituality to succeed despite adversity. This emphasises the need for future research to employ a more empowering and positive framework when dealing with marginalised groups, particularly in Malaysia, where this viewpoint is frequently overlooked.

Second, while the findings foreground individual strengths such as resilience, gratitude, self-efficacy, and spiritual engagement, these resources do not operate in isolation. Participants' narratives consistently revealed structural constraints that shaped how and to what extent such strengths could be mobilised. Limited access to affordable childcare, rigid workplace arrangements, long working hours, and the rising cost of living in urban areas constrained mothers' capacity to rest, reflect, and sustain well-being. In this sense, personal strengths functioned as adaptive responses within structurally restrictive conditions rather than substitutes for systemic support. Therefore, interventions should adopt a dual approach that combines psychological and emotional support with structural measures such as accessible childcare provision and

flexible work policies, to avoid placing excessive responsibility on mothers to cope individually.

Third, the nuanced findings surrounding gratitude as both a facilitative resource and, at times, a source of emotional tension suggest that psychosocial interventions should be applied sensitively and on an individual basis. While gratitude practices may foster meaning and emotional regulation for some mothers, they may also evoke self-blame or emotional dissonance for others when relief does not follow. Practitioners should therefore support emotional literacy and validation alongside positive coping strategies to ensure that women are not encouraged to suppress distress in the name of gratitude or positivity.

Finally, this study advances the call for socially and culturally grounded policies that support low-income working mothers, particularly in the pursuit of Sustainable Development Goal 5 (Gender Equality) and Malaysia's 12th Malaysia Plan targets for female labour force participation. Efforts that honor the lived realities and inner strengths of these women such as accessible childcare, flexible work arrangements, and community-based faith and education initiatives can create environments where resilience is sustained and agency is amplified.

Limitations and Recommendations for Future Research

This study provides an in-depth look into a small sample of urban low-income working mothers' coping mechanisms using diary

narratives for seven-consecutive days followed by interviews. Future studies should employ longitudinal approaches to explore the stability or transformation of coping mechanisms and growth strategies over extended periods. Such research could offer deeper insights into the dynamic nature of resilience of this group. Additionally, future research would benefit from incorporating multiple perspectives, such as those of family members, employers, and social service providers. Including these diverse viewpoints can provide a more comprehensive and holistic understanding of the challenges, coping strategies, and resources available to low-income working mothers. This multi-stakeholder approach could reveal insights into how social and workplace environments influence mothers' coping mechanisms and personal growth, thus could enable the development of more robust and context-sensitive interventions and policies.

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Drivers of Boycott and Switching Behaviour toward Israeli-affiliated Products: The Roles of Religiosity, Social Media, Animosity, and Ethnocentrism

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ABSTRACT

The boycott of products affiliated with Israel is a global phenomenon that is ongoing in various countries, including Indonesia. Consumers carry out boycotts as a form of support for Palestinians and as protests against Israel's actions. This study analysed the influence of religiosity, social media, animosity, and consumer ethnocentrism on boycott behaviour and switching behaviour toward products affiliated with Israel. The research used a quantitative approach, with 286 respondents. This research used non-probability sampling techniques, including voluntary sampling, and analysed the data using descriptive and SEM methods. Results showed that religiosity did not affect animosity, whereas social media affected animosity. Religiosity, social media, animosity, and consumer ethnocentrism significantly affect boycott behaviour. Boycott behaviour and animosity significantly affected switching behaviour. However, religiosity did not affect switching behaviour.

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INTRODUCTION

Conflict, a prevalent social issue, arises from differences between individuals and groups. Herman and Nurdiansa (2010) note that conflicts often emerge when distinct ethnic groups interact, leading to disputes due to cultural differences. The Israeli-Palestinian conflict is one of the most enduring and violent conflicts in modern history. Israel launched major offensives against Gaza in 2008, 2012, 2014, and 2021, causing widespread destruction and long-term psychological trauma (Sorongan, 2023).

As of August 1, 2024, the Palestinian Central Bureau of Statistics (PCBS) reported 16,673 children and 11,269 women killed, 4,700 missing, over 94,000 seriously injured, two million displaced, and 360,000 housing units damaged. These tragedies spurred global solidarity, including mass demonstrations in Indonesia, the UK, South Korea, Brazil, and Malaysia (Septiazi & Yuliana, 2023). The United Nations (UN) and European Union (EU) condemned Israel's actions as human rights violations and called for a ceasefire and investigation. Citizens worldwide initiated boycotts of companies perceived as supporting Israel (Trisnawati, 2024).

Boycotts, deliberate refusals to engage with unethical entities (Yusuf et al., 2023), have become a form of consumer activism. In Indonesia, religious sentiments have fuelled boycott movements. The Indonesian Ulema Council (MUI) issued Fatwa No. 83/2023, urging Muslims to avoid Israeli-affiliated products (Ardiansyah & Hermawan, 2024). Religiosity is a key driver of boycott

behaviour, leading consumers to reject products that conflict with their moral or religious values (Abosag & Farah, 2014; Muhamad et al., 2019).

Social media amplifies boycotts by raising awareness and mobilising support through platforms such as Twitter and Facebook (Makarem & Jae, 2016; Palacios-Florencio et al., 2021). Emotional reactions such as anger and hostility toward perceived injustice also motivate boycotts (Makarem & Jae, 2016). Studies have confirmed that religiosity and animosity significantly predict boycott behaviour (Lestari & Jazil, 2024; Suraji et al., 2023; Tao et al., 2022). Consumer ethnocentrism drives the rejection of foreign products, including McDonald's, Starbucks, and Disney+ (Khoiruman & Wariati, 2023; Trisnawati, 2024).

Interestingly, boycotts have extended to local retailers selling products such as Royco, Kecap Bango, Milo, and Downy (Husna et al., 2023). This aligns with Weber's theory of social action, which highlights meaningful behaviours shaped by social contexts (Fatah, 2024; Sica, 2013). Boycotts often lead to switching behaviour, where consumers choose alternative products due to dissatisfaction or ethical concerns (Noviana, 2018). Religiosity and animosity are closely tied to switching behaviours (Abdelwahab et al., 2022; Buhari, 2022; Kim, 2018). However, most previous studies have examined these factors separately. For example, research has often focused only on religiosity as a predictor of boycott intentions (Abosag & Farah, 2014; Muhamad et al., 2019) or on

social media's role in mobilising collective action (Makarem & Jae, 2016; Palacios-Florencio et al., 2021).

Interestingly, boycotts have extended to local retailers selling products such as Royco, Kecap Bango, Milo, and Downy (Husna et al., 2023). This aligns with Weber's theory of social action, which highlights meaningful behaviours shaped by social contexts (Fatah, 2024; Sica, 2013). Boycotts often lead to switching behaviour, where consumers choose alternative products due to dissatisfaction or ethical concerns (Noviana, 2018). Religiosity and animosity are closely tied to switching behaviours (Abdelwahab et al., 2022; Buhari, 2022; Kim, 2018). Such shifts in consumer purchasing patterns can alter market dynamics, requiring businesses to respond strategically in order to maintain their competitive position. Entrepreneurial orientation and innovative marketing approaches are therefore important for firms seeking to sustain competitive advantage in increasingly competitive markets (Mahrinasari et al., 2024). However, most previous studies have examined these factors separately. For example, research has often focused only on religiosity as a predictor of boycott intentions (Abosag & Farah, 2014; Muhamad et al., 2019) or on social media's role in mobilising collective action (Makarem & Jae, 2016; Palacios-Florencio et al., 2021).

Studies addressing animosity and consumer ethnocentrism have also tended to treat them as independent variables influencing boycotts (Khoiruman & Wariati,

2023; Trisnawati, 2024), without considering their combined effects. Moreover, empirical investigations integrating religiosity, social media, animosity, and ethnocentrism to explain both boycott and switching behaviours, especially in the Indonesian Muslim context, remain scarce. Despite the visibility of these movements, empirical studies on how religiosity, social media, animosity, and ethnocentrism influence boycotts and switching behaviour remain limited. This study addresses this gap by exploring the factors driving Indonesian consumers to boycott and switch to Israeli-affiliated products.

LITERATURE REVIEW

Social Action Theory

Weber's social action theory emphasises the subjective meaning of individual or group actions in social contexts. According to Weber, social actions are not merely reactive but are driven by internal motivation and goal-oriented rationality (Sica, 2013). These actions are shaped by how individuals interpret and assign meaning to social facts, positioning humans as active agents rather than passive recipients of social structures (Fatah, 2024).

Weber identified three types of social relationships based on motivation and rationality: (1) traditional relations, rooted in customs and long-standing practices; (2) coercive relations, shaped by authority and power imbalances; and (3) associative or goal-oriented relations, arising from shared interests and mutual agreements.

He also categorised social action into four types based on actors' motives (Muhlis & Norkholis, 2016): (1) traditional action, guided by ingrained habits; (2) affective action, driven by emotions; (3) instrumental rational action, involving calculated efforts to achieve specific goals; and (4) value-rational action, grounded in deeply held beliefs and values, regardless of the outcome of the action.

Boycott Behaviour

Boycotting refers to the refusal to purchase products from a specific group because of socially or morally unacceptable opinions or actions (Sormin et al., 2024). Friedman (1985) defines it as a consumer effort to achieve certain goals by urging individuals or groups to stop purchasing from a specific market. Boycotts are often used to reject the values or actions of specific companies, groups, regions, or countries (Makarem & Jae, 2016). Another view sees it as collective consumer behaviour, avoiding products and brands from a specific country (Khoiruman & Wariati, 2023).

In a social context, boycotts can restrict individual interactions within society, reflecting existing social realities (Mokobombang et al., 2023). They emerge when consumers stop engaging with suppliers from specific areas to penalise unacceptable corporate behaviours (Palacios-Florencio et al., 2021). As a common societal reaction to protests or dissatisfaction (Mokobombang et al., 2023), boycotts are driven by motivations such as economic, religious, minority, ecological,

relational, and labour-related factors (Cruz, 2016). They represent consumer power and act as a social mechanism for controlling businesses, thereby affecting public policy (Ali, 2020). Participation depends on beliefs, needs, and attitudes (Khoiruman & Wariati, 2023).

Switching Behaviour

According to Noviana (2018), switching behaviour stems from "customer switching", referring to consumers' freedom to shift their preferences toward a particular product. This may arise from diverse product offerings or issues with previous products. It involves consumers considering alternatives within the same category while changing their providers. Other studies have described it as brand-switching behaviour caused by specific factors, reflecting a consumer's tendency to shift brands (Kasmo & Jayanti, 2018).

Noviana (2018) classified switching behaviour into two types: internal and external. Internal migration occurs when consumers change products within the same company, allowing the brand to retain its customer base. External migration involves switching to a different provider and is divided into total and partial switches. Total switching means that consumers completely abandon the previous provider, whereas partial switching indicates that only a portion of engagement is lost, making it subtler and harder to detect.

Consumer decisions to switch can be influenced by factors such as price, company reputation, service failure

responses, service quality, satisfaction, commitment, demographics, competition, and unintentional switching (Clemes et al., 2017; Yao et al., 2022). In this study, switching behaviour may result from company affiliations with Israel, consumer satisfaction, commitment, and other factors.

Hypothesis Development

Personal judgment, hostility, and religious values significantly shape consumer decisions to boycott specific companies and countries (Suraji et al., 2023). Intrinsic religiosity is a key motivator for faith-based boycotts (Kalliny et al., 2018). Endorsements from religious authorities and solidarity among believers across national borders further strengthen boycott intentions (Muhamad et al., 2019). For example, Muslim consumers often view boycotts as effective ways to uphold religious and moral causes. Empirical studies have also shown that religiosity, along with factors such as age and attitude, influences ethical consumption behaviours, such as reading halal labels (Simanjuntak & Dewantara, 2021). These insights highlight religiosity as a major driver of the rejection of products affiliated with Israel.

H1: Religiosity significantly affects the boycott behaviour of products affiliated with Israel.

In this study, such rejection is understood not only as a refusal to purchase or support Israeli-affiliated products but also as a tendency to switch to alternative products that are more consistent with

one's religious and ethical values. Highly religious consumers often seek products that align with their faith-based principles and avoid products that contradict their beliefs. Previous research indicates that religiosity can encourage consumers to replace boycotted products with alternatives perceived as more ethical or halal (Alam et al., 2025; Buhari, 2022). Therefore, religiosity is expected to play an important role in driving both rejection and switching behaviours.

H2: Religiosity significantly affects switching behaviour.

Animosity refers to negative feelings such as anger, resentment, or hostility toward a country or group perceived as morally or politically wrong (Maher & Mady, 2010). In the context of this study, animosity toward Israel arises from perceived injustices and violations of humanitarian and religious values. Religiosity can shape these emotions because individuals with strong religious commitment tend to interpret global conflicts through a moral or faith-based perspective. When a country or company is perceived as acting against religious values, highly religious consumers may develop moral outrage and hostility as a form of defence of their faith (Lestari & Jazil, 2024; Tao et al., 2022). Therefore, religiosity can increase animosity by reinforcing emotional sensitivity and empathy toward conflict victims who share the same religious identity.

H3: Religiosity significantly affects animosity.

Social media refers to interactive digital platforms such as X, Instagram, and Facebook that enable users to create, share, and exchange information in real time (Eren-Erdoğan & Ergun, 2017). These platforms play a crucial role in facilitating communication, mobilising public sentiment, and coordinating collective action. In the context of the Israeli-Palestinian conflict, social media functions as a primary channel for expressing opinions, spreading boycott-related content, and strengthening user solidarity (Ibrahim, 2023; Septiazi & Yuliana, 2023). The rapid circulation of boycott hashtags, viral campaigns, and digital petitions amplifies awareness and emotional engagement, thereby influencing users' consumption choices. Through exposure to persuasive content and moral appeals, consumers may develop stronger ethical motivations to avoid products affiliated with Israel and to participate in boycott movements. Therefore, social media serves as both an informational and emotional driver of boycott behaviour. This role is consistent with previous studies showing that information-seeking and consumer knowledge can influence purchasing behaviour and stimulate word-of-mouth among consumers (Yuliati & Simanjuntak, 2024).

H4: Social media significantly affects the boycott behaviour of products affiliated with Israel.

Prastiwi and Harsoyo (2025) found that negative sentiments on social media significantly influence consumers' decisions to boycott unethical products, shaping

perceptions and emotional responses in boycott contexts. An analysis of Facebook and Twitter revealed that user involvement is linked to out-group animosity, with negative content reinforcing hostility toward certain groups (Rathje et al., 2021). Similarly, Carr (2025) reported that social media interactions can escalate anxiety into animosity, worsen relationships, and intensify social polarisation. These findings highlight the critical role of social media in driving and amplifying animosity during widely discussed social conflicts.

H5: Social media has a significant effect on animosity

Emotions such as anger, hostility, and contempt significantly influence consumer decisions, particularly in purchasing and boycotting behaviour (Chiu, 2016; Maher & Mady, 2010). Boycotts often serve as emotional expressions of consumer dissatisfaction and protest (Farah & Newman, 2010). Negative emotions, especially hostility, are among the strongest predictors of boycott participation (Lindenmeier et al., 2012). Research further highlights that hostility, self-enhancement, and brand distrust contribute to consumers' intentions to boycott, with emotional intensity playing a dominant role (Mokobombang et al., 2023). Animosity, a specific form of negative emotion, may also help consumers reduce guilt and enhance their self-image by aligning their actions with perceived moral or ethical standards (Maher & Mady, 2010).

H6: Animosity significantly affects the boycott behaviour of products affiliated with Israel.

Regional identification and animosity can trigger negative emotions such as anger and sadness. In research, regional identification reflects emotional ties to a region, such as Spain, influencing consumers to switch brands, particularly in the food and beverage industries (Abdelwahab, 2022). Dislike or hatred toward a region or brand can drive consumers to stop purchasing and switch to alternatives. Similarly, animosity from the South Korea-China conflict led to negative sentiments toward ethnic Chinese restaurant patrons, showing animosity's direct and indirect effects on consumers' switching intentions (Kim, 2018). These insights highlight animosity's role in driving consumers' switching behaviour away from Israeli-affiliated products, as consumers avoid brands linked to a disliked out-group.

H7: Animosity affects the switching behaviour of consumers of products affiliated with Israel.

Consumer ethnocentrism is the belief that buying foreign products harms the domestic economy both morally and economically (Elida, 2015; Jiménez & Martín, 2010). Ethnocentric consumers view purchasing foreign goods as unpatriotic, linking it to threats against national employment and industry. This mindset influences attitudes toward domestic products and drives the boycott of foreign brands, especially during political conflicts (Lee et al., 2017). Ethnocentrism intensifies when foreign countries are perceived as hostile or misaligned with national interests, leading to selective consumption and boycotting behaviour. Empirical studies confirm its significant role in motivating boycotts,

as seen with McDonald's in politically sensitive contexts (Ali, 2020; Khoiruman & Wariati, 2023). Thus, ethnocentrism is a key factor in shaping consumer resistance to foreign goods and a preference for local alternatives.

H8: Consumer ethnocentrism significantly affects the boycott behaviour of products affiliated with Israel.

External factors such as social awareness and ethical values significantly influence consumer product choices. Research shows that exposure to information on Israeli-affiliated products increases consumers' willingness to boycott and switch to alternatives that align with their moral stances (Rohaya et al., 2024). As ethical awareness grows, consumers become more selective and prioritise products that reflect their values. Boycott intentions often translate into actual behavioural changes, with studies highlighting ethical concerns as key drivers of purchasing decisions (Margarena et al., 2024). Previous research also indicates that switching barriers can influence consumers' decisions to remain with or move away from a product, depending on the perceived value and the level of trust toward the brand (Simanjuntak et al., 2020). However, in boycott contexts, consumers may become more willing to overcome these barriers and switch to alternative products that better align with their ethical values.

H9: Boycott behaviour significantly affects the switching behaviour of products affiliated with Israel.

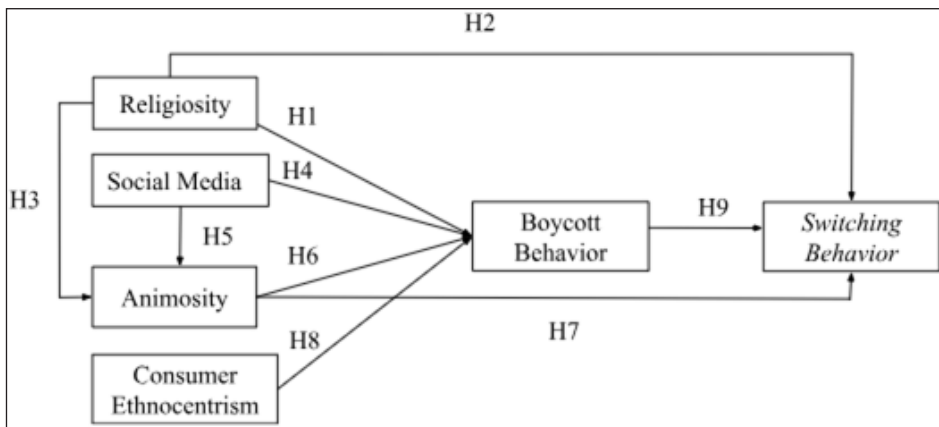


Figure 1. Research framework

Figure 1 illustrates the conceptual framework of this study, which examines the relationships between religiosity, social media, animosity, consumer ethnocentrism, boycott behavior, and switching behavior.

METHODOLOGY

Research Design and Approach

This study employed a quantitative cross-sectional design to assess the influence of religiosity, social media, animosity, and consumer ethnocentrism on boycott and switching behaviours toward Israeli-affiliated products. To complement the quantitative results, an in-depth interview with one respondent was conducted to gain contextual insights into boycott motivations. Although not intended for generalisation, the interviews enriched and triangulated the quantitative findings.

Participants were selected using purposive sampling, focusing on Indonesian Muslims aged 18 years or older who had boycotted Israeli-affiliated products. This

ensured that the respondents met the study's objectives. Data were collected online from 13 February to 7 March 2025 from respondents residing in various Indonesian regions. The study was approved by the Research Ethics Commission of Bogor Agricultural University (No. 1598/IT3 KEPMSM-IPB/SK/2025).

Sample and Sampling Technique

Respondents were selected using purposive sampling, in which participants were deliberately selected based on specific criteria relevant to the research objectives. This technique is a form of non-probability sampling, where participation occurred voluntarily through an online survey link distributed via WhatsApp, X (formerly Twitter), and Instagram. The inclusion criteria were Indonesian Muslim consumers aged 18 years or older who had previously participated in or were currently participating in boycotts of Israeli-affiliated products. In total, 286 valid responses were obtained

using Google Forms. The questionnaire consisted of four sections: screening, demographic information, research variable items, and additional questions.

Data Collection

Data were collected using a digital questionnaire developed on Google Forms. The first section included screening questions to ensure that the respondents met the study criteria. The second section captured the respondents' profiles, including name, age, gender, domicile, occupation, and income. The third section measured the following key variables: religiosity, social media use, animosity, and consumer ethnocentrism concerning boycott behaviour and switching to products affiliated with Israel. The last section included questions about boycott motivations, decision-making patterns, boycott inception, types of products boycotted, and commitment to future boycotts. In-depth interviews were conducted with one respondent who chose the answer 'no' to the additional question about future boycott commitment despite peace between Israel and Palestine. The respondents were then contacted for in-depth interviews via WhatsApp.

Variables and Measurements

This study measured six key variables using a Likert-type scale. Religiosity (Roswinanto & Suwanda, 2023) was assessed using six indicators related to religious practices, such as performing obligatory and voluntary prayers, reciting dhikr, and fasting, measured on a five-point

scale ranging from [1] never to [5] always. Social media influence (Campos-Freire et al., 2022; Eren-Erdoğan & Ergun, 2017) was measured using seven items to evaluate the role of social media in shaping awareness and behaviour regarding the boycott of Israel-affiliated products using a five-point agreement scale from [1] strongly Disagree to [5] strongly Agree. Animosity (Khoiruman & Wariati, 2023; Suhud, 2017) was measured using five indicators capturing emotional responses and negative sentiments toward Israel's actions, rated on a five-point agreement scale. Consumer ethnocentrism (Elida, 2015; Novita, 2017) was measured using seven items that reflected moral and nationalistic preferences for domestic over foreign products, based on the same 5-point agreement scale. Boycott behaviour (Khoiruman & Wariati, 2023; Palacios-Florencio et al., 2021; Ulker-Demirel et al., 2020) was measured using five items that assessed behavioural intentions and actions toward avoiding Israel-affiliated products, also using a five-point agreement scale. Finally, switching behaviour (Noviana, 2018; Zinnia et al., 2020) was evaluated using six items reflecting consumers' considerations to switch to substitute products, measured on a five-point Likert scale.

Data Analysis

This study employed descriptive analysis and structural equation modelling (SEM) to address the research objectives. Descriptive analysis was used to explore the distribution of respondent characteristics, including

sex, age, region of origin, occupation, and monthly allowance or income, and the results are presented in tables showing the minimum, maximum, mean, and standard deviation. The total score for each variable was then transformed into an index using a standard formula, and the resulting index was classified into three levels: low (≤ 60.00), moderate (60.01-79.99), and high (≥ 80.00). SEM was conducted using SmartPLS software to examine the relationships among the variables. The analysis comprised a measurement model (outer model), a structural model (inner model), and hypothesis testing.

RESULTS AND DISCUSSION

Respondent Characteristics

Demographic analysis showed that 66.8% of the respondents were female ($n = 191$). The majority (59.4%) of the participants were aged 18-23 years ($n = 170$), with an average age of 24.97 years ($SD = 6.56$). Most respondents (44.1%) were from West Java ($n = 126$). Regarding occupation, 60.8% were students ($n = 174$). Regarding monthly income, the largest group (33.9%) reported earnings above IDR 2,000,001 ($n = 97$), with an average income of IDR 1,486,888.11 ($SD = IDR 833,010.45$).

Boycott Behaviour

Boycott behaviour was analysed in relation to respondents' motivations, decision-making patterns, onset of boycotting, types of products boycotted, and future boycott commitment. These findings provide insights into consumer actions toward

Israeli-affiliated products. The distribution of the responses is summarised in Table 1.

The majority (61.5%) reported being driven by emotional hostility toward Israel. Regarding decision making, 58.4% ($n = 167$) cited personal and family-based decisions. Most respondents (77.6%) began boycotting after October 7, 2023, and attacks ($n = 222$). McDonald's was the most boycotted brand (88.5%). Regarding future intentions, 76.6% expressed a commitment to continue the boycott even if peace was achieved. Approximately two out of ten respondents (23.4%) chose not to continue the boycott if there was peace between Israel and Palestine. This statement was explored further through an in-depth interview with the question, 'What is the reason you decided not to continue the boycott when there is peace between Israel and Palestine?'. Based on the results of the in-depth interviews, respondents answered the following questions:

I decided not to continue the boycott because the conflict situation is very complex, and it is not always clear how it will affect the companies that I boycott. In addition, my daily needs and the limited product selection near my residence make it challenging for me to consistently boycott. Peace efforts have also made me reconsider whether boycotting is still an effective step to accommodate Israel's responsibility. Also, if the boycott continues, more and more workers may be laid off. If this occurs on a large scale, it can increase the number of unemployed.

The workers are not at fault; the ones to blame are the people who support genocide. I will boycott if it is proven that a company actually provides support to these people. — (DIR, 21 Years old, Female)

In the food category, McDonald's, KFC, Burger King, and King of Dates were the

most boycotted, with local alternatives, such as Sabana, Chick n Tea, D'Kriuk, Richeese, Crisbar, CFC, and Rocket Chicken. Starbucks and Nescafé were commonly boycotted as beverages, with replacements including Janji Jiwa, Fore, Kopi Kenangan, and Tomoro. Disney+ and Netflix were boycotted in the entertainment category, although no alternative was cited.

Table 1
Boycott behaviour

Category	Frequency	Percent
Boycott Motivation (Answer more than one)		
Animosity level toward Israel	176	61.5
Level of religiosity	161	56.3
Calls from social media	150	52.4
My ethnocentrism	90	31.5
Boycott Decision-Making Pattern		
Individual and family	167	58.4
Individual	106	37.1
Family	13	4.5
Period of starting the product boycott		
After the October 7, 2023, attack	222	77.6
Before the October 7, 2023, attack	64	2.4
Distribution of boycotted products (Answer more than one)		
McDonald	253	88.5
Starbucks	249	87.1
KFC	218	76.2
Coca-Cola Company	212	74.1
Pizza Hut	199	69.9
Unilever Products	193	67.5
Burger King	189	66.1
Domino's Pizza	180	62.9
Disney+	154	53.8
Baskin Robbins	149	52.1
Adidas	131	35.8
Intel	106	37.1
Others	25	8.6
Commitment to future boycotts		
Yes	219	76.6
No	67	23.4

Note. Others are Nestl, Rose All Day, Esqa, Apple, Danone, CNN, Puma, Nike, Pringles, Johnson's, Kellogg's, Lego, P&G, Colgate, L'Oréal, Levi's, Nescaf, and Popeyes.

In cosmetics, Maybelline and L'Oréal were replaced by local brands such as Wardah, Purbasari, BLP, and Emina. For skincare, alternatives to Garnier, Nivea, and Esqa include Sari Ayu, Skintific, Somethinc, and Kahf. Technology brands such as HP, Intel, and Apple were included in the boycotts, with Samsung and Rexus being mentioned as alternatives, and Google reported no alternatives. In household products, Unilever, P&G, Cussons, and OT Group were boycotted in favor of Wings, Softness, and Paragon. In this fashion, the Puma was replaced by the Ventela. In-depth interview questions were also asked of respondents to learn more about the products that were eventually boycotted and the substitute products used. The question was “What products do you need, but are known to be affiliated with Israel?” and was answered by the respondent:

The products I use that are affiliated with Israel are Garnier face wash and Pepsodent toothpaste. — (DIR, 21 Years old, Female)

Confirmed further confirmed the substitute products by asking the question, “During the boycott, what alternative products did you use as substitutes?”. Respondent answered the following questions:

The substitute products that I used during the boycott, for toothpaste I changed it to Ciptadent, for face wash soap, sometimes Wardah, sometimes Emina. — (DIR, 21 Years old, Female)

Table 2 illustrates the distribution of boycotted products and their corresponding alternative products across several categories.

Table 2
Distribution of boycotted and alternative products

	Boycotted products	Alternative products
Food	McDonald's, KFC, Burger King, King of Dates Domino's Pizza, Pizza Hut Dunkin Donuts Mondelez, Oreo, KitKat Kecap Bango	Sabana, Chick n Tea, D'kriuk, Richeese, Crisbar, CFC, Ayam Jatinangor, Almaz, Hisana, Ayam Geprek Juara, Hokben, Rocket Chicken, A&W, D'besto Burger Bangor, Pizza Box, Burger Mountain Boys, JIF Pizza, Laziza Roti'O Hot Ways, Mixue, Miels, Hot Side Story, Siantar Top, Mayora Masako, Kecap Sedap
Beverage	Aqua, Danone Starbucks, Nescafé Coca-Cola, Fanta, Pepsi, Sprite Nestle, Milo	Lee Mineral, Cleo, Labaik, Hexagonal, Oasis Janji Jiwa, Fore, Kopi Kenangan, Point Coffee, Bagi Kopi, Tomoro - Susu Ultra, Indomilk, Morinaga

Table 2 (continued)

	Boycotted products	Alternative products
Entertainment & Media	Disney, Netflix	-
Make Up	Maybelline, L'Oréal	Wardah, Made for Makeup, Purbasari, Marshwillow, Mother Of Pearl, Makeover, BLP, Instaperfect, Emina
Skincare	Garnier, Nivea, L'Oréal, Esqa, Rose All Day	Sari Ayu, Purbasari, Marina, Cetaphil, Kahf, Skintific, Avoskin, Ms Glow, Somethinc, Facetology
Technology	HP, Intel, Apple Google	Rexus, Samsung -
Household Products	Unilever, P&G, Cussons, OT Group Pepsodent Pantene, Sunsilk, Johnson's, Zwitsal Lux Sunlight, Rinso	Wings, So Soft, Produk Paragon Ciptadent, Enzim, Sensodyne, Close Up, Barakat, Formula Emeron, Zinc, Rejoice, Sasha, Nature, Crystalline, Viva Shampoo Lerbia, Biore Mama Lemon, Sabun Ekonomi, Daia
Fashion	Puma	Ventela

Variable Descriptive

Table 3 presents the distribution of respondents across the variables, based on the top and bottom box percentages. Regarding religiosity, 80.5% reported performing obligatory prayers on time, and 57.0% were categorised as having low religiosity. Regarding social media, 95.1% of respondents obtained information about Israeli-affiliated products through these platforms, with 59.8% falling into the high category. Regarding animosity, 97.6% believed Israel should be held accountable for its actions against Palestine, with 84.7% being classified in the high category. Regarding consumer ethnocentrism,

Table 3
Distribution of respondents by category of each variable

Variables	Category						Range	Average ± SD (Index)
	Low (≤60.00)		Moderate (60.01-79.99)		High (≥80.00)			
	n	%	n	%	n	%		
Religiosity	163	57.0	92	32.2	31	10.8	16.7 - 100	57.7 ± 17.7
Social media	16	5.6	99	34.6	171	59.8	14.3 - 100	82.5 ± 13.2
Animosity	9	3.1	35	12.2	242	84.7	50.0 - 100	89.7 ± 11.4
Consumer Ethnocentrism	109	38.1	139	48.6	38	13.3	14.3- 89.3	63.1 14.6
Boycott behaviour	24	8.4	55	19.2	207	72.4	15.0 - 100	84.6 ± 14.1
Switching behaviour	154	53.8	118	41.3	14	4.9	33.3-100	60.0 ± 10.5

87.1% agreed that Indonesians should prioritise domestic products, although 48.6% fell into the moderate category. Regarding boycott behaviour, 96.9% reported avoiding Israeli-affiliated products when alternatives were available, with 72.4% in the high category. In contrast, 81.2% of the respondents recognised that ethical values and social issues influenced their decision to switch from products affiliated with Israel, with 53.8% categorised as having low switching behaviour.

Evaluation Analysis of Measurement Model (Outer Model)

Several indicators had factor loadings ≤ 0.5 , including MS1 (social media), EM5 (animosity), R_EK6 (consumer ethnocentrism), and SB2, SB4, and SB5

(switching behaviour). Indicators with loadings ≥ 0.5 were retained due to their conceptual relevance. After removal, all remaining indicators met the validity threshold (factor loading ≥ 0.5), indicating that the measurement model was valid and suitable for further analysis (Figure 2).

Reliability and Validity

Validity and reliability were assessed using Composite Reliability (CR ≥ 0.7), Cronbach's alpha (CA ≥ 0.6), and Average Variance Extracted (AVE ≥ 0.5). The results indicate that all six variables met the required thresholds, confirming that the constructs were valid and reliable for further analysis. The detailed results are presented in Table 4.

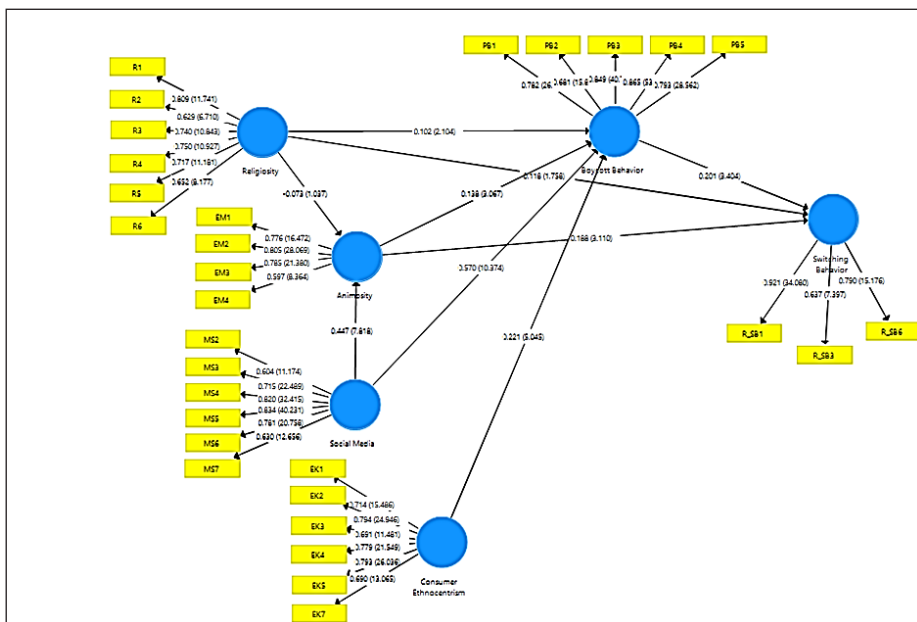


Figure 2. Final structural equation model

Table 4

Composite reliability (CR), Cronbach's alpha (CA), and average variance extracted (AVE)

Latent Variables	Composite Reliability (CR)	Cronbach's Alpha (CA)	Average Variance Extracted (AVE)
Religiosity	0.832	0.730	0.555
Social Media	0.882	0.842	0.555
Animosity	0.875	0.826	0.542
Consumer Ethnocentrism	0.896	0.854	0.635
Boycott Behaviour	0.865	0.826	0.519
Switching Behaviour	0.829	0.746	0.623

Structural Model Evaluation Analysis (Inner Model)

The results show that the boycott behaviour variable has an adjusted R-squared value of 0.556. This shows that the boycott behaviour variable is influenced by the variables in this study by 55.6%, while the rest (44.4%) is influenced by other variables not examined. The switching behaviour variable has an adjusted R-squared value of 0.101. This shows that the variables in this study can explain only 10.1% of the variability in switching behaviour. Other variables outside the study influenced the remaining participants (89.9%). This value is much lower than that for boycott behaviour, indicating that the factors in this study explain the boycott behaviour variable more strongly than the switching behaviour variable. Table 5 presents the results of the adjusted R-squared value analysis.

Table 5

Result of adjusted r-squared value

Latent Variables	R Square	R-squared Adjusted
Boycott behaviour	0.563	0.556
Switching behaviour	0.101	0.092

A model fit test was conducted using the Goodness of Fit (GoF) indicator. The analysis results show that the Goodness of Fit (GoF) falls into the large category (strong fit). This shows that the research model is a good fit for the data. However, the Standardised Root Mean Square (SRMR) value was 0.086, slightly above the cut-off value of ≤ 0.08 . Nevertheless, this value is still acceptable. Meanwhile, the Root Mean Square Theta (RMS Theta) was 0.134, greater than the cut-off value. This indicated that the measurement model did not fully meet the criteria. The Normed Fit Index (NFI) was 71.6%. Although it does not reach the ideal limit of ≥ 0.9 , this value is still within the acceptable range of 0.70-0.80, indicating that the model has a good fit. The results of the model fit tests are listed in Table 6.

Hypothesis Test

The analysis results show that religiosity has a positive and significant influence on boycott behaviour, with a path coefficient of 0.099, a t-statistic of 2.323, and a p-value of 0.021. A t-statistic > 1.96 and a p-value < 0.05 confirm that H1 can be accepted.

Table 6
Overall model fit result

Indicators	Cut-off Value	Test Results
Standardised Root Mean Square (SRMR)	≤ 0.08	0.086
Root Mean Square Theta (RMS Theta)	< 0.102	0.134
Normed Fit Index (NFI)	≥ 0.9	0.716
Goodness of Fit (GoF)	0.10 (Small) 0.25 (Medium) 0.36 (Large/Strong)	0.421

Furthermore, religiosity did not influence switching behaviour. The results show a path coefficient of -0.118, a t-statistic of 1.696, and a p-value of 0.090, indicating that H2 is rejected. The results of the analysis of the religiosity on animosity show a path coefficient of -0.073, a t-statistic of 1.078, and a p-value of 0.282; thus, H3 is rejected. Social media has a positive and significant effect on boycott behaviour, with a path coefficient of 0.570, a t-statistic of 10.694, and a p-value of 0.000. Therefore, H4 was accepted in this study.

The analysis of social media variables on hateful emotions yielded a path coefficient of 0.447, a t-statistic of 7.895, and a p-value of 0.000; thus, H5 was accepted. The results show that animosity has a positive and significant effect on boycott behaviour, with a path coefficient of 0.142, a t-statistic of 3.183, and a p-value of 0.002; thus, H6 is confirmed. The analysis results for the variable animosity towards switching behaviour indicate a path coefficient of 0.188, a t-statistic of 3.160, and a p-value of 0.002; thus, H7 is accepted. In addition, the results of the statistical tests show that consumer ethnocentrism also has a positive and significant influence on boycott

behaviour, with a path coefficient of 0.219, a t-statistic of 5.378, and a p-value of 0.000. Thus, H8 is accepted. Finally, boycott behaviour positively and significantly affects switching behaviour, with a path coefficient of 0.236, a t-statistic of 5.068, and a p-value of 0.000. These results confirm that H9 is acceptable. The results for the path coefficients, t-statistics, and p-values are presented in Table 7.

Religiosity had a negative direct effect on switching behaviour ($\beta = -0.118$) and a minimal indirect effect via boycott behaviour ($\beta = 0.005$), resulting in an insignificant total effect ($\beta = -0.113$). This suggests that higher religiosity correlates with a lower tendency to switch. Social media showed no direct effect but had an indirect effect ($\beta = 0.211$) on switching behaviour by increasing animosity and boycott behaviour.

Animosity had a significant direct effect on switching behaviour ($\beta = 0.188$) and a small indirect effect through boycott behaviour ($\beta = 0.028$), yielding a total effect of $\beta = 0.216$, making it the most influential factor. Consumer ethnocentrism showed no direct effect but had an indirect influence ($\beta = 0.044$) via boycott behaviour, indicating that stronger ethnocentrism increases switching

Table 7
Path coefficients, t-statistics, and p-values between variables

Path	Path Coefficients	t-statistics (>1.96)	p-values (<0.05)	Hypothesis
Religiosity → Boycott behaviour	0.099	2.323	0.021	Accepted
Religiosity → Switching behaviour	-0.118	1,696	0.090	Rejected
Religiosity → Animosity	-0.073	1.078	0.282	Rejected
Social media → Boycott behaviour	0.570	10.694	0.000	Accepted
Social media → Animosity	0.447	7.895	0.000	Accepted
Animosity → Boycott behaviour	0.142	3.183	0.002	Accepted
Animosity → Switching behaviour	0.188	3.160	0.002	Accepted
Consumer ethnocentrism → Boycott behaviour	0.219	5.378	0.000	Accepted
Boycott behaviour → Switching behaviour	0.236	5.068	0.000	Accepted

tendencies through boycott participation. Overall, animosity most strongly influenced switching behaviour, while social media and ethnocentrism had indirect effects through animosity and boycotts. Religiosity's direct negative effect remained insignificant. Detailed decomposition is presented in Table 8.

Table 8
The decomposition of the effect on switching behaviour

Variable	Direct Effect	Indirect Effect	Total Effect
Religiosity	-0.118	0.005	-0.113
Social media	-	0.211	0.211
Animosity	0.188	0.028	0.216
Consumer ethnocentrism	-	0.044	0.044

Discussion

Religiosity has a positive and significant influence on boycott behaviour. Individuals with higher levels of religiosity are more likely to engage in boycott movements against Israel's products. Religiosity is essential to individual identity and decision-

making (Ahmad et al., 2017; Misran et al., 2021). According to Kalliny et al. (2018), religious beliefs underpin consumer motivation in faith-based boycotts. This is further supported by Suraji et al. (2023), who emphasised that religion plays a central role in encouraging consumers to boycott Israeli products.

However, religiosity had no significant effect on switching behaviour (path coefficient = -0.083; $t = 1.128$; $p = 0.237$), indicating that religious beliefs do not necessarily encourage product switching, especially in contexts with limited product alternatives and socioeconomic constraints. This finding contrasts with previous studies that found religiosity to positively influence switching behaviour (Alam et al., 2025; Buhari, 2022). The difference may be explained by contextual factors in Indonesia, where consumers tend to maintain habitual purchasing patterns and consider price and accessibility before switching to new products. Although religiosity shapes ethical awareness, it may not always translate into behavioural change when alternatives are scarce or more expensive.

The analysis results show that religiosity has no significant effect on animosity (path coefficient = -0.073; $t = 1.078$; $p = 0.282$); thus, it does not directly encourage boycott behaviour toward Israeli-affiliated products. This finding differs from previous studies highlighting the role of religiosity in shaping consumer behaviour. The insignificance of religiosity in influencing animosity may be explained by Indonesia's sociocultural and digital context. Indonesian society is predominantly religious yet tends to express religiosity in a moderate and collective manner, emphasizing social harmony over confrontation. As a result, emotional reactions toward international conflicts are more likely to be shaped by media exposure, political narratives, and public discourse rather than by personal religious beliefs. The strong influence of digital media in framing issues such as the Israel-Palestine conflict may have overshadowed individual religiosity, leading to varied emotional responses across consumers (Lestari & Jazil, 2024).

Social media has a positive and significant influence on boycott behaviour (path coefficient = 0.570; $t = 10.694$; $p = 0.000$) because it can shape public opinion, disseminate information, and strengthen user solidarity regarding conflict issues (Makarem & Jae, 2016; Septiazi & Yuliana, 2023). Social media is also an interaction space that accelerates the spread of information and triggers collective action during boycott movements.

Social media also significantly influenced hateful emotions (path coefficient = 0.447; $t = 7.895$; $p = 0.000$). Engagement

with Israeli-Palestinian conflict content on social media reinforces the negative emotions that drive boycott behaviour. Platforms such as Facebook and Twitter play an important role in spreading hateful sentiments and fostering emotional solidarity (Carr, 2025; Prastiwi & Harsoyo, 2025; Rathje et al., 2021). Thus, social media engagement has a major influence on shaping the hateful emotions that trigger boycott decisions.

Animosity had a positive influence on boycott behaviour (path coefficient = 0.142; $t = 3.183$; $p = 0.002$) and switching behaviour (path coefficient = 0.188, $t = 3.160$, $p = 0.002$), indicating that feelings of animosity towards Israel encourage consumers to avoid related products and switch to more value-compatible alternatives. This is consistent with research suggesting that anger and animosity encourage consumers to avoid certain products (Chiu, 2016). This is in line with Abdelwahab (2022), who stated that animosity can influence consumer behaviour to move away from disliked brands.

Consumer ethnocentrism also positively and significantly affects boycott behaviour (path coefficient = 0.219; $t = 5.378$; $p = 0.000$). Consumers with high ethnocentrism tend to reject foreign products due to hostility (Elida, 2015; Lee et al., 2017) and choose local products as a form of national solidarity (Khoiruman & Wariati, 2023).

Additionally, boycott behaviour positively affects switching behaviour (path coefficient = 0.236; $t = 5.068$; $p = 0.000$), but not all consumers who boycott switch to substitute products. Factors such as limited

choice, access to alternative products, and personal preferences inhibit consistency in switching behaviour, although ethical awareness and social motivation remain high (Margarena et al., 2024; Rohaya et al., 2024). Respondents' statements also support the results of this analysis through in-depth interviews, which state the following.

...In addition, my daily needs and the small selection of products in my neighborhood make it harder for me to consistently boycott... — (DIR, 21 Years old, Female)

Reinforced by another statement, the respondent also said:

...for face wash soap, sometimes it is Wardah, sometimes it is Emina. — (DIR, 21 Years old, Female)

Further, respondents were asked, "Do you feel certain benefits when using substitute products? For example, your monthly expenses decrease because the alternative products are more affordable." The respondent then answered,

Yes, I feel like using Wardah, Emina, the price tends to be more economical. — (DIR, 21 Years old, Female)

Furthermore, respondents were asked again, "Even though you feel there are benefits when using the product, do you still choose not to continue the boycott?". Respondents answered:

So far, my decision is still the same, like the reasons I mentioned earlier,

there are indeed reasons that cause me to choose not to continue the boycott, one of which is that I still haven't found a suitable product. — (DIR, 21 Years old, Female)

This statement shows that practical constraints and limited access to alternative products make it difficult for respondents to fully boycott the brand. Although there is an intention to switch and the benefits of more affordable alternative products are perceived, this is insufficient to change consumer preferences and habits. The limited choice of products that suit their needs is the main obstacle to maintaining consistent boycott behaviour. Thus, switching behaviour has not fully become consistent because limited choices and other practical factors influence it.

Weber's social action theory analysed respondents' behaviour toward boycotting products affiliated with Israel. This theory classifies individual social actions into several types: traditional, affective, instrumental, and value rationality. In addition, formal rationality and associative social relations were used as references to interpret respondents' decisions. Based on the research results, indicators influencing boycott behaviour can be mapped to social action types according to their respective characteristics. It shows that social action theory helps explain that respondents' decision to boycott a product is influenced not only by a single factor but also by a combination of emotions, values, habits, and rational consideration of the social situation. Table 9 shows that social action theory

Table 9
Theory contribution

Weber's Types of Social Action	Description of Action	Example of Research Result
The traditional action	Actions that arise because of ingrained habits or social influences.	Respondents boycott because they are used to being in a family or neighborhood that boycotts.
The affective action	Actions arising from emotional drives and conditions.	Boycotts are carried out as an emotional response to the Israeli-Palestinian conflict, often driven by anger and animosity.
The instrumental rationality	Actions that logically and strategically consider goals and means.	Boycotts of companies affiliated with Israel are a strategy to exert economic pressure.
The value of rationality	Actions are taken based on personal judgments without considering results.	Boycotts are carried out as a commitment to religiosity and solidarity with Palestine.
The associative social relationships	Actions are taken as an adjustment to a collective interest equally motivated.	Respondents follow boycott actions because they feel part of a shared social movement on social media or in their community.

helps explain that respondents' decision to boycott a product is influenced not only by a single factor but also by a combination of emotions, values, habits, and rational consideration of the social situation.

CONCLUSION

This study involved 286 female respondents aged 18-23, domiciled in West Java, mostly students with monthly incomes above IDR 2,000,001. Over half of the respondents had low religiosity, high social media engagement, and animosity toward Israel. Consumer ethnocentrism was moderate, boycott behaviour was high, and switching behaviour was low. The influence test showed that religiosity had no effect on animosity, while social media significantly influenced animosity. Religiosity, social media, animosity, and consumer

ethnocentrism positively and significantly influenced boycott behaviour. Animosity and boycott behaviours significantly affected switching behaviour, whereas religiosity did not. Social media had the strongest impact on boycott behaviour, highlighting its role in shaping public opinion. Although boycott behaviour influences switching, not all respondents replaced boycotted products, possibly due to limited alternatives or personal preferences. Thus, switching behaviour reflects consumer awareness but does not always lead to consistent product replacements.

Theoretically, this study extends Weber's Social Action Theory by illustrating that Indonesian Muslim consumers' participation in boycotts reflects various forms of social action. Habit-and family-influenced boycotts represent traditional

actions, whereas emotional responses such as anger and empathy illustrate affective actions. Decisions based on moral or religious beliefs indicate value rational actions, whereas strategic participation in campaigns reflects instrumental rationality. Furthermore, engagement in social media movements and collective solidarity demonstrates an associative social action. These findings highlight that boycott and switching behaviours are not merely economic responses but also socially meaningful actions shaped by religiosity, emotion, and collective identity.

Policy Implications

The study reveals that religiosity, social media, animosity, and consumer ethnocentrism significantly influence boycott behaviour toward Israeli-affiliated products. Social media had the strongest influence, followed by consumer ethnocentrism, animosity, and religiosity. While boycott behaviour also affects switching behaviour, not all consumers who boycott shift to alternative products. The strong impact of social media highlights the need for improved digital literacy and social awareness. The Ministry of Communication and Digital (Komidigi) should oversee digital campaigns to prevent misinformation and potential social conflict. Similarly, BPKN and YLKI can educate consumers about consumption ethics and the economic effects of boycotts through social media or partnerships with educational institutions.

For companies, maintaining an active and value-driven social media presence is

crucial for protecting their reputation and building positive consumer relationships, minimising risks from misinformation-led boycotts. Regulations requiring clear product origin labelling can help consumers align their purchases with their values, with the Ministry of Trade (MOT) enforcing transparency policies. MSMEs and local industries, supported by Kemenkop UKM and Kemenperin, should strengthen local product marketing to appeal to ethnocentric consumers. Policies ensuring accessible and affordable substitutes are also vital and require collaboration between the MOT, distributors, and local retailers. Finally, the Ministry of Religious Affairs can promote Islamic consumption ethics through education and digital da'wah. Companies should align their communication strategies with societal and religious values to foster trust.

Limitations and Recommendations

This study focused solely on Muslim consumers; thus, the findings cannot be generalized to the entire population. Measuring religiosity as an independent variable also posed challenges in selecting indicators that fully represented it. Consumers are encouraged to be more selective by considering ethical and social values, as well as the broader impact of their purchases. Boycott participation can be strengthened by supporting alternative products aligned with personal principles to maximise effectiveness. For companies and institutions, understanding factors such as social media, religiosity, animosity, and

ethnocentrism is crucial for addressing consumer behaviour dynamics. Consumer protection agencies and policymakers can leverage these insights to promote responsible consumption through education and regulations. Future research should include in-depth interviews to explore the information sources and additional factors influencing boycott decisions. Incorporating perceived substitutability is vital because limited alternatives may hinder switching behaviour. Social groups, memberships, and reference groups should also be considered, given the strong influence of social media on boycotts. Further studies are needed to comprehensively understand consumer behaviour dynamics in Indonesia.

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SUPPLEMENTARY DATA

Table S1

Research variables and indicators

Variables	Code	Indicators
Religiosity	R1	I perform obligatory prayers on time.
	R2	I perform obligatory prayers in congregation.
	R3	I regularly performed the duha voluntary prayer.
	R4	I regularly performed voluntary tahajjud prayers.
	R5	I often recite dhikr.
	R6	I regularly fast on Mondays and Thursdays.
Social media	MS1	Social media plays a significant role in determining my purchasing decisions.
	MS2	Through social media, I obtained information about products affiliated with Israel.
	MS3	I often seek information before purchasing to avoid products affiliated with Israel.
	MS4	Boycott calls on social media trigger me to avoid products affiliated with Israel.
	MS5	I changed my purchase preferences after learning that a product is affiliated with Israel.
	MS6	Comments about boycotting products affiliated with Israel influence my purchasing behaviour.
	MS7	I feel compelled to voice my opinion on boycotting products affiliated with Israel through social media.
Animosity	EM1	Israel's actions towards Palestine make me very angry.
	EM2	In my opinion, Israel has done an unfair thing to Palestine.
	EM3	Israel must take responsibility for what it has done, is doing, and will do to Palestine.
	EM4	I will never forgive Israel for what it has done to Palestine.
	EM5	I do not like Israelis.
Consumer ethnocentrism	EK1	As an Indonesian citizen, I would rather buy domestically made products than foreign-made products.
	EK2	I think products made in Indonesia are first, last, and foremost.
	EK3	Buying foreign products does not reflect a sense of nationalism.
	EK4	An authentic Indonesian should always buy products that are made in Indonesia.
	EK5	We should buy products made in Indonesia and not let other countries get rich by selling their brands.
	EK6	I buy foreign products only when they cannot be obtained in my country.
	EK7	In my opinion, Indonesian consumers who buy foreign-made products are partly responsible for Indonesian citizens losing their jobs.
Boycott behaviour	PB1	I would feel guilty if I bought products affiliated with Israel.
	PB2	When there is an alternative, I avoid products affiliated with Israel.
	PB3	I am not interested in purchasing products affiliated with Israel.
	PB4	I am committed to not buying products affiliated with Israel.
	PB5	I have stopped buying products affiliated with Israel, said one participant.

Table S1 (*continued*)

Variables	Code	Indicators
Switching behaviour	SB1	I tend to stick with Israel-affiliated products because they are high quality.
	SB2	Ethical values and social issues influence consumers' decisions to switch from products affiliated with Israel.
	SB3	Product quality influences consumer loyalty to Israeli-affiliated products.
	SB4	Price is the main factor influencing consumers' decisions to switch from products affiliated with Israel.
	SB5	Brand image influences consumers' decisions to switch from products affiliated with Israel.
	SB6	Product innovation affiliated with Israel can increase consumer loyalty in the following ways.

Digital Financial Literacy: Insights from Bibliometric Review based on SPAR-4-SLR ADO Model and Future Research Direction

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ABSTRACT

This study combines a systematic literature review with bibliometric analysis to provide both qualitative and quantitative insights in the field of digital financial literacy (DFL), which integrates the concepts of financial literacy and digital literacy. With the increasing penetration of digital devices and internet usage, the need for digital financial literacy among individuals has become more noticeable. The study draws on data collected from the Scopus database, comprising 743 documents published between 2015 and 2025 for bibliometric analysis and 119 articles for in-depth content analysis. Bibliometric analysis was conducted using the Biblioshiny package in R and VOSviewer to identify emerging research areas and thematic structures within the DFL literature. This was followed by content analysis guided by the SPAR-4-SLR model. Based on this integrated approach, a conceptual framework was developed using the Antecedents–Decisions–Outcomes (ADO) framework. The framework identifies key antecedents of digital financial literacy namely demographic characteristics, financial capacity, behavioural factors, and institutional influences and links them to outcomes such as financial stability, empowered decision-making, investment growth, fintech development, and digital financial inclusion. The study offers valuable insights for policymakers, individuals, and academics seeking to better understand and advance digital financial literacy.

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INTRODUCTION

Financial literacy also has an important role in understanding the level of one's financial well-being (Atkinson & Messy, 2012; Mokhtar et al., 2015) because it has a great impact on savings and retirement outcomes (Bucher-Koenen & Lusardi, 2011). In a situation of increased economic development and a constantly growing population, there has also been a focus on optimising the management of financial resources. It has also been realised that there has been a need for maximising financial literacy in this regard, and therefore, the OECD has taken certain steps in this respect (Recommendation of the Council on Financial Literacy, 2020). Financial literacy has been discovered to have a significantly positive effect on the degree of individuals' financial inclusion. As the delivery of financial services continues to move to online platforms, there has been an expansion in the scope related to financial literacy, including the emergence of digital financial literacy. Digital financial literacy can be identified as the use of knowledge, skills, attitudes, and behaviours related to finance, which help people understand digital technology, as well as use digital financial services in a manner contributing to their overall financial health (OECD, 2024).

Considering digitalisation, the vast use of digital devices and better penetration of the internet have, therefore, fast-tracked the adoption of digital financial services (Shen et al., 2018; Yao et al., 2022), thus promoting digital financial inclusion. Most prior studies have only considered

bibliometric analysis in separation; hence, this study extends the literature by integrating bibliometric analysis with content analysis in developing a predominant conceptual framework. RQ1 identifies the main clusters of digital financial literacy using keyword co-occurrence analysis, while RQ2 seeks to identify the emerging, established, and future themes on digital financial literacy using overlay visualisation and thematic evolution techniques. RQ3 focuses on the identification of critical research gaps and goes ahead to propose future research agendas in the domain of digital financial literacy. The subsequent section undertakes a review of the theoretical underpinnings, which is then followed by bibliometric and content analysis in detail to formulate future research directions on digital financial literacy.

THEORETICAL BACKGROUND

Financial Literacy

Financial literacy has become a necessary life skill in the rise of increasing economic growth and a growing workforce. It involves knowledge and the capacity to handle numbers to obtain, gain access to, and manage resources with efficiency (The National Adult Literacy Agency, 2005) and cognitive and mental abilities for good financial management (Remund, 2010). An individual's personal finances are partly dependent on their financial literacy level (Lusardi, 2015b; Sabri & Zakaria, 2015), and basic financial literacy is very relevant for making major financial decisions (Lusardi, 2015a). Particularly,

one's readiness for old age depends on one's knowledge and awareness of personal finances (Bucher-Koenen & Lusardi, 2011).

Digital Literacy

Digital literacy entails the capacity of an individual to possess and use required skills for information technology, thus enabling the ability to engage effectively with the digital economy with the goal of meeting the criteria for the Sustainable Development Goals (Reddy et al., 2020). Digital literacy is frequently measured using criteria such as the usage of information technology with the ability to use computers, laptops, as well as mobile phones effectively for their intended purpose. This includes the use of mobile technology for the sending and receiving of information as well as the use of social media platforms for access and participation (Lyons & Kass-Hanna, 2021b; Mahdzan et al., 2022). Digital literacy is conceptualised using three stages: the first stage is the acquisition of digital skills with the emphasis on the knowledge and the attitude towards technology; the second stage is the effective use of the technology; and the last stage is the culmination of innovation with the emphasis on digital transformation (Martin & Grudziecki, 2006).

Digital Financial Literacy

Digital Financial Literacy (DFL) is an important area of convergence of financial literacy and digital literacy (Lyons & Kass-Hanna, 2021a), which has become increasingly important in influencing

financial technology diffusion and financial behaviour (Nurkholik, 2023). Digital financial literacy is a component that is understood to be an integration of knowledge, attitudes, skills, and behaviour competencies that aim to empower people to effectively understand, access, and use financial services and technology for the end goal of improved financial well-being.

Review studies in the relevant field

A review of literature is important for any research to be carried out and as a result, many researchers have undertaken literature review studies including bibliometric review, structured review and systematic literature studies, where majority of the studies conducted is bibliometric study and review (20), followed by a few structured literature review (3) whereas (6), article where a combination of bibliometric review. While prior reviews in the digital financial literacy domain have predominantly employed PRISMA-based systematic procedures and, in some cases, the TCCM framework to organise extant knowledge, these approaches largely remain descriptive and classificatory in nature. PRISMA-based reviews ensure transparency and methodological rigor in study selection but offer limited guidance for theory building. Similarly, the TCCM framework structures literature across theories, contexts, characteristics, and methods. However, it does not explicitly explain how or why relationships among constructs evolve within a behavioural decision-making process.

In contrast, the Antecedents–Decisions–Outcomes (ADO) framework adopted

in this study provides a process-oriented and causal lens that enables deeper theoretical insight. By explicitly linking structural and behavioural antecedents to individual decision mechanisms and subsequent financial outcomes, the ADO framework reveals dynamic pathways that remain obscured in traditional thematic or classificatory reviews. This approach allows for the identification of underexplored mediators and contextual moderators, thereby advancing digital financial literacy research from thematic aggregation towards explanatory theory development. The ADO-based synthesis not only complements existing PRISMA and TCCM reviews but extends them by offering a conceptual architecture through which future empirical studies can systematically test behavioural and institutional mechanisms shaping digital financial literacy.

Thus, Table 1 represents the consolidation of major reviews in this field.

As shown in Table 1, a brief overview of recent reviews on DFL by various researchers tends to indicate that two streams have emerged, which are intrinsic to DFL studies, measuring DFL, and its determinants. Although early empirical research, such as that carried out by (Lyons & Kass-Hanna, 2021b), helped to establish a foundation of financial literacy measures by merging financial literacy and digital literacy on a validated scale, other exploratory factor research has more recently steered a course in a direction that focuses on structural mapping, rather than empirical analysis, to discern paradigms of important authors, keyword correlation, and knowledge voids,

as seen in a recent bibliometric analysis by (Yadav & Banerji, 2023) followed by another by (Ishak et al., 2024). This body of research tends to suggest that while DFL has become a rapidly growing field, it remains largely atomised from a theoretical viewpoint.

Subsequent reviews include the determinants and enabling factors of digital financial literacy in their assessment, often embedding DFL studies within the wider context of digital financial inclusion in the digital economy. These reviews represent the increasing attempt to include the concept of DFL in the context of the increasing financial technology environment. Nevertheless, most reviews mentioned represent an exploratory level of inquiry, which tends more to classify and thematic map rather than provide causal analysis. The application of integrative reviews using PRISMA and TCCM frameworks, developed recently by (Paul et al., 2024), represents a significant step forward to better identify the underlying theoretical perspectives, which range from Behavioural Economics, Human Capital Theory, Agency Theory, to the Diffusion of Innovation Theory, and so forth. Nevertheless, most reviews have tended to use these models on a descriptive level rather than critically evaluating the ways in which the models intersect or contrast to explain digital financial conduct.

As compared to the previous literature reviews that emphasised the use of bibliometric mapping as the methodology, the current literature review incorporates

Table 1

Summary of reviews in digital financial literacies from 2021 to 2025

No	Authors	Focus	Type
1	Lindez-Macarro et al. (2025)	Financial frauds	BR
2	Argade et al. (2024)	Financial literacy and SME	BR
3	Azaria & Noviani (2024)	Digital financial literacy and accounting research	BR
4	Baheti et al. (2024)	Digital financial inclusion	BR
5	Ishak et al. (2024)	Digital finance	BR
6	Jose & Ghosh (2024)	Digital financial literacy and financial behaviour	SLR
7	Jin Liu (2024)	Digital financial inclusion	BR
8	Kaweesa et al. (2024)	Islamic financial literacy	BR
9	Rani & Mittal (2024)	Financial literacy and financial inclusion	BR + SLR
10	Rehman & Mia (2024)	Financial literacy	SLR
11	Sari et al. (2024)	Digital Economy, Entrepreneurship and Financial Literacy	BR
12	Satiti et al. (2024)	Financial Technology Literacy	SLR + BR
13	Sharma et al. (2024)	Financial Satisfaction	BR + SLR
14	Suryavanshi et al. (2024)	Financial Inclusion	BR
15	Yadav & Banerji (2024)	Digital Financial Literacy	SLR
16	Yuvaraja & Perumandla (2024)	Financial Literacy	BR
17	Arruum & Lestari (2023)	Digitalisation and Financial Literacy	BR
18	S. Damayanti & Rahmawati (2023)	Financial Literacy and Investment Decision	BR
19	DerMesrobian (2023)	Financial Literacy	BR
20	Fadilla et al. (2023)	e-wallets	BR
21	Fengwen & Ali (2023)	Women Financial Inclusion and Literacy	BR
22	Kiky (2023)	Financial Literacy and Fintech	BR
23	Nathie et al. (2023)	Financial Literacy	BR + SLR
24	Senduk & Djatmika (2023)	Financial Education in Digitlized Era	BR
25	Yadav & Banerji (2023)	A bibliometric analysis of digital financial literacy	BR
26	Zaimovic et al. (2023)	Financial Literacy	SLR
27	Lajuni et al. (2022)	Financial Literacy and Knowledge	BR
28	Aziz et al. (2021)	Digital Banking and Financial Inclusion	BR
29	Gálvez-Sánchez et al. (2021)	Financial Inclusion	BR
30	Kaur et al. (2021)	Financial Satisfaction	BR + SLR

BR- Bibliometric Review; SLR – Systematic Literature Review

the use of the ADO model to address the theoretical linkages entailed between the antecedents of DFL, the decision-making processes associated with financial literacy of individuals, and the consequences or

outcomes that come with such processes. As a result of integrating methodology for the first time in the literature review, the literature review contributes to the area of methodology through the use of the SPAR for

SLR protocol in conjunction with the use of the ADO model for conceptual contributions through the theoretical underpinning for the area of DFL studies based on the cause-and-effect model of analysis.

Digital financial literacy is rapidly acknowledged to be an interdisciplinary concept that transcends conventional notions of financial literacy. Findings from behavioural economics studies and consumer education elucidate in-depth explanations regarding individual learning processes of digital financial information. On behavioural economics, individual cognitive biases like overconfidence, mental accounting, and loss aversion are shown to greatly impact digital financial behaviour. In fact, individual behaviour patterns themselves inform about the requirements for digital financial literacy to not only focus on gaps in knowledge but also to overcome decision-making challenges. On the other hand, by drawing on the perspectives of consumer education studies, experiential learning strategies for digital financial literacy must enable individuals to cultivate critical competence regarding digital tools, financial products, and online security. Conversely, drawing on multiple perspectives will further consolidate DFL as a concept by conveying that for successful financial literacy programs to occur simultaneously, one must consider behaviourism, learning theories, as well as technological feasibility.

METHODOLOGY

Analysis using bibliometrics is instrumental in creating a conceptual framework for

research, structuring existing research studies, making research whole, analysing research gaps, and future research focus in a research discipline. Thus, bibliometric research when properly employed allows for a systematic approach to a literature review that brings about accurate results from a vast bibliographic database. In this research, article selection and elimination were done in accordance with (Paul et al., 2021) Scientific Procedures and Rationales for Systematic Literature Review model, also known as SPAR-4-SLR, that includes stages of assemble, arrange, and assess mending a systematic approach towards filtering research studies, hence commonly enhancing research precision (Yadav & Banerji, 2023). Thus, when applied in systematic research, the assemble process entails identifying, procuring, arranging by organising and purifying a research database, and finally, arranging entails analysing by evaluating a research process followed by information-reporting (Donthu et al., 2021). The resulting database was used for research analysis focused on the research questions, while steps involved in a systematic review process can be seen in Figure 1.

Data Assembling

The data was obtained from the Scopus database, which was chosen as a singular source for bibliometric data, owing to its wide coverage, strong indexing criteria, and wide discipline base that includes social sciences, management, and business studies. It is a well-known database for having a

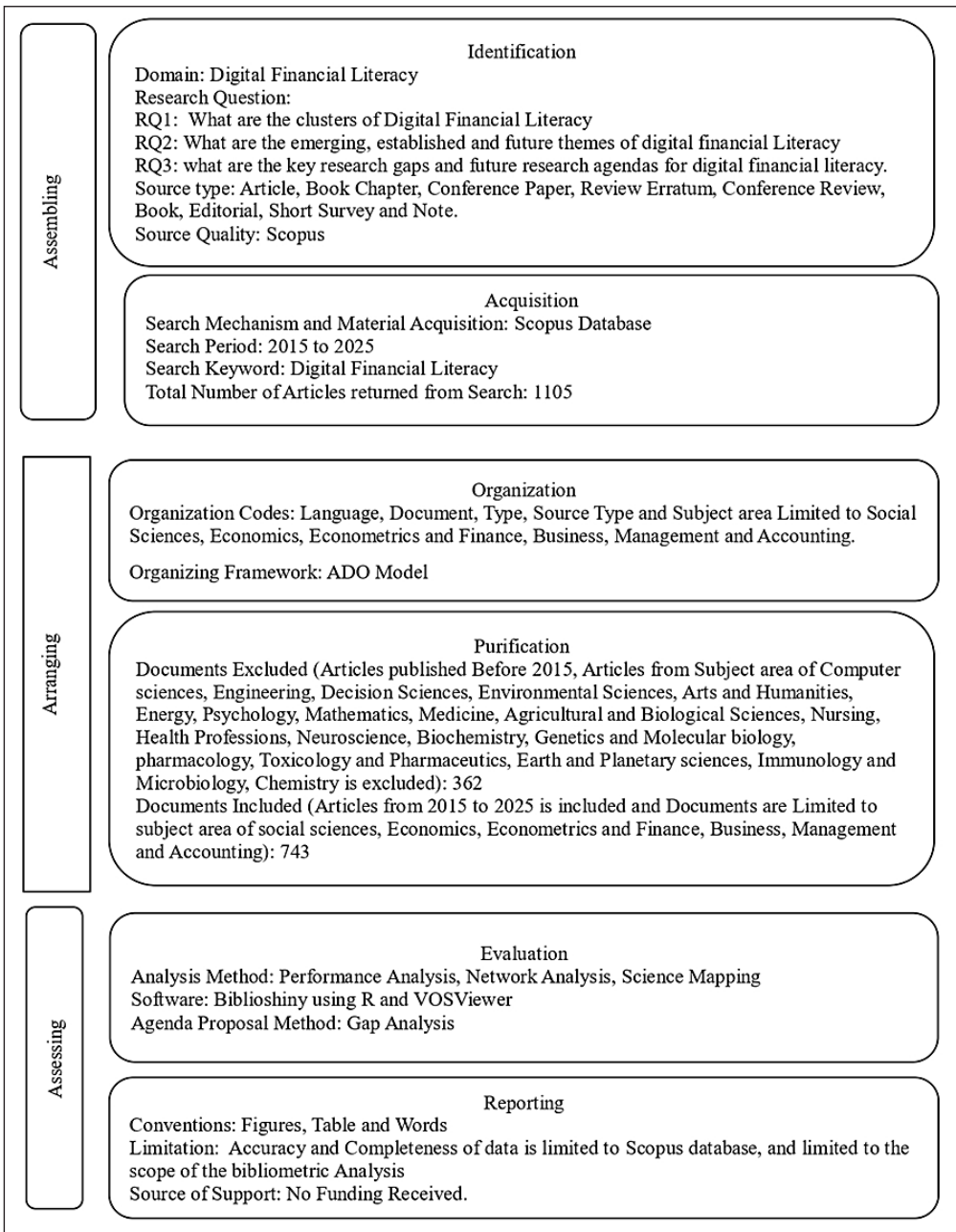


Figure 1. The SPAR-4-SLR protocol adapted from (Paul et al., 2021)

strongly peer-reviewed journal base with a good citation index, thereby being a much more accurate source for bibliometric

studies compared to Web of Science, Mendeley, and other databases. The search for literature used the following keywords:

TITLE-ABS-KEY (digital AND financial AND literacy) AND PUBYEAR > 2014 AND PUBYEAR < 2025 AND (LIMIT-TO (SUBJAREA, "ECON") OR LIMIT-TO (SUBJAREA, "SOCI") OR LIMIT-TO (SUBJAREA, "BUSI")).

Data Arranging

After initial filtration, the subject area was limited to specified field, with the publication period from 2015 to 2025, Covering a span 10 years.

Data Assessing.

Using SPAR-4-SLR, the assessment has been carried forward, where the bibliometric analysis has been carried using R studio with Biblioshiny Package, and VOS Viewer to Clustering and analysing (Donthu et al., 2021).

After bibliometric mapping, a systematic content analysis was conducted to understand the thematic clusters and derive the most prominent antecedents and outcomes from the literature. The shift from quantitative mapping to qualitative synthesis was facilitated by the SPAR-4-SLR protocol (Paul et al., 2021). The ADO (Antecedents–Decisions–Outcomes) model was used as the conceptual analytical template for content integration. This model was chosen against alternative models including TCCM and IMO because it can holistically obtain the causal chain of relationships in capturing antecedent variables (socio-economic and psychological enablers) to decision processes (fintech usage behaviour)

and resultant outcomes (digital financial inclusion and empowerment).

ADO allows for more processual and dynamic understanding of how DFL develops at individual and institutional levels. For the methodological transparency, the inclusion criteria were limited to Scopus-indexed English language journal articles, published during 2015-2025, and thematically connected with DFL. Non-empirical studies that were not in the digital form or without full-text access were excluded. The steps provided for both conceptual accuracy and replicability in the review process.

The highest-cited and thematically core papers in each cluster were studied using manual coding in Excel to discover conceptual patterns. In order to provide reliability, two independent coders coded the extracted data, and differences were negotiated until consensus. This allowed bibliometric findings to be combined with qualitative depth, providing a thematic interpretation that is coherent.

RESULTS AND DISCUSSION

Main Information

The Table 2 represent the details regarding the data considered for the Bibliometric analysis.

Table 2 depicts the overall development in research papers on digital financial literacy from 2015 to January 2025 on various publication dynamics, document types, authors, and collaboration networks. It includes a total of 743 research papers from 494 sources, with a healthy annual

Table 2
Main Information about the Bibliometric data

Description	Results
Main information about data	
Timespan	2015:2025
Sources (Journals, Books, etc)	494
Documents	743
Annual Growth Rate %	35.59
Document Average Age	2.16
Average citations per doc	9.68
References	36580
Document contents	
Keywords Plus (ID)	974
Author's Keywords (DE)	2062
Authors	
Authors	2054
Authors of single-authored docs	102
Authors collaboration	
Single-authored docs	108
Co-Authors per Doc	3.04
International co-authorships %	21.4
Document types	
Article	563
Book	4
Book chapter	91
Conference paper	42
Conference review	5
Editorial	2
Erratum	8
Note	1
Review	26
Short survey	1

growth rate of 35.59 percent. The average age of a research paper is 2.16 years, with a total of 9.68 citations per document and a cumulative total of 36,580 references.

There are also 563 articles from journals, 91 book chapters, 42 conference articles, 26 review articles, 8 errata, 5 conference reviews, 4 books, 2 editorials, and 1 note and

short survey. Looking at the distribution of the keyword, the dataset has information on 974 keywords and 2,062 author-submitted keywords. There are also 2,054 authors in the dataset, with the single-author document number being 102. There is an average of 3.04 co-authors per document, while the number of documents that had international co-authorship is at 21.4%.

To determine the most relevant sources for the articles related to digital financial literacy, Figure 2 represent the most relevant source of articles regarding Digital Financial Literacy.

Most Relevant Source

Figure 2 shows that the leading publishing outlet or journal for research related to Digital Financial Literacy (DFL) is Sustainability (Switzerland), with 18 published articles. This is trailed by Finance Research Letters with 12 articles and the Journal of Risk and Financial Management and Studies in Systems, Decision and Control with more than 10 articles each. Other journals that follow include Finance: Theory and Practice, Investment Management and Financial Innovations, and Journal of Infrastructure, Policy and Development and Research in International Business and Finance with eight articles each. Also included in the sources and with fewer articles published are the International Journal of Bank Marketing and Cogent Business and Management with seven and six articles respectively.

To know the Co-occurrence of the Keyword relating to digital financial literacy, Figure 3 shows the Co-occurrence analysis using fractional counting.

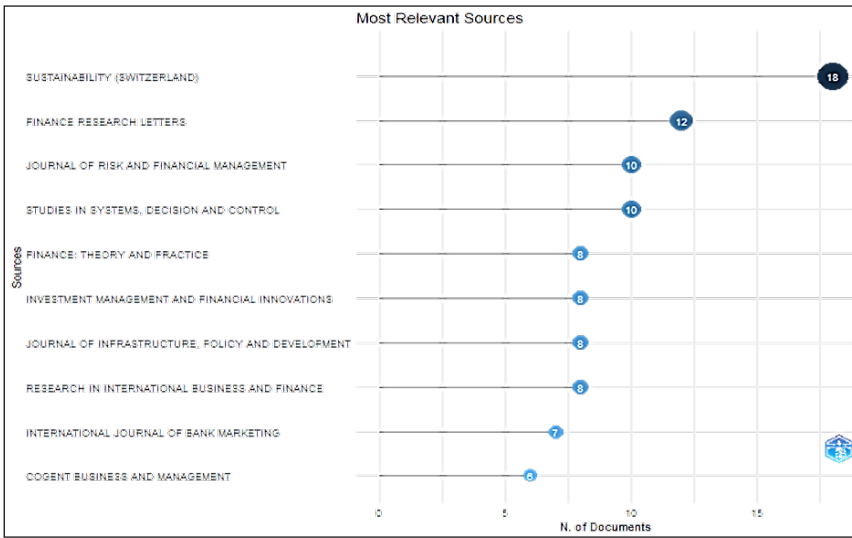


Figure 2. Most Relevant Sources

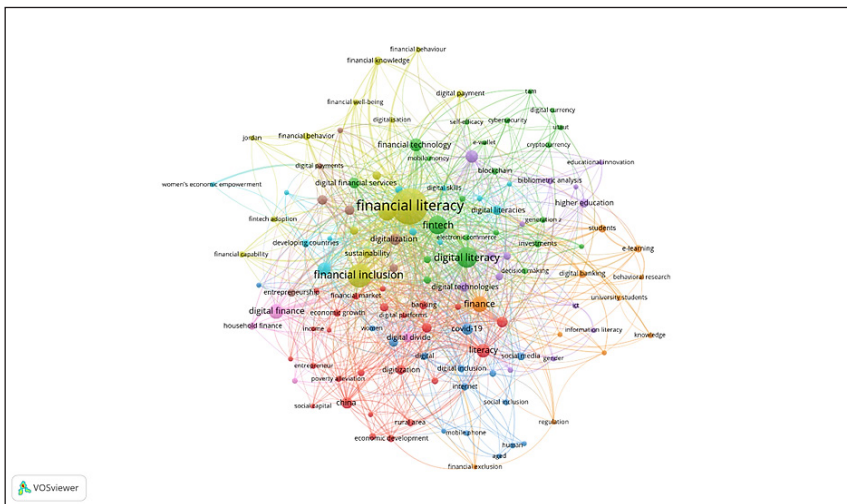


Figure 3: Co-occurrence Analysis

Co-occurrence Analysis

The co-occurrence analysis carried with “all keywords” with “fractional counting” resulted in 125 keywords out of 2724 keywords met the threshold of keywords repeated more than 5 times

(Donthu et al., 2021). Co-occurrence analysis determines the frequency with which keywords occur together in the same documents and describes conceptual relationships as well as prevalent research themes within a field. Through clustering

related keywords, it can visualize the intellectual structure of the field and identify emerging or related topics.

The Red cluster concentrates on “Digital Finance and Economic development” with 25 items. On closer examination, the keywords in cluster 1 include digital inclusive finance, digital platforms, digitisation, economic growth, economic development, microfinance, social capital, financial market, financial provision, financial services and financial systems all relating to digital finance and economic development. Cluster 2 spotted in green colour with 22 items is relating to “financial literacy and inclusion” as the sub-theme include block chain, crypto currency, digital currency, digital literacy, digital financial services, financial services and financial inclusion, cluster 3 with 15 items represented in blue colour is “Social Inclusion and regulation”, further interrogation the sub-category identified as empowerment, digital inclusion, internet, social media, technology and social inclusion. The cluster 4 differentiated in yellow colour with 15 items “FinTech and digital payments” indicate major sub-themes as financial knowledge, financial literacy, financial inclusion and well-being, fintech adoption, and digitalisation. Cluster 5 with 14 items in violet colour named as “digital technology”, segregates sub-themes artificial intelligence, educational innovation, ICT, education technology and digital technologies. Cluster 6 with 12 items indicated in Light Blue colour, named as “Digital Financial

Empowerment” with sub-categories of decentralised finance, digital financial inclusion, digital libraries, digital literacies, digital skills and sustainable development, Cluster 7 with 11 items indicated in orange colour concentrates on “education and digital banking”, includes sub-categories of e-learning, information and communication, knowledge and regulation. cluster 8 with 7 item concentrates on “Innovation”, as further scrutiny results in sub themes of digital economy, digital transformation, digital payments, MSME and Entrepreneurship, cluster 9 with four items Concentrates on “digital divide”, identified in pink colour as Household finance and household consumption. This addresses the RQ1 of determining the clusters of DFL, where the clusters have been identified with the co-occurrence analysis of keywords.

To determine the conceptual structure of the Keyword of digital financial literacy, Figure 4 Represent the conceptual structure.

Conceptual Structure

The Co-word analysis as a conceptual structure shows the themes including area of research and growth trend, taking into consideration the research area of the articles and identify the key research items, and the keywords are presented, (Li et al., 2018), as the keyword structure is from R software, using bibliometrix, under MCA (Greenacre & Blasius, 2006), The keyword cluster created using Louvain’s cluster with default parameter, with automatic layout and normalisation.

The diagram is structured with authors' countries on the left, keywords positioned centrally, and sources on the right. The analysis indicates that most contributions originate from India, followed by Indonesia and China. Across these contributions, twenty dominant keywords emerge, including financial literacy, financial inclusion, digital literacy, digital financial literacy (DFL), fintech, digital finance, digital financial inclusion, financial technology, financial education, COVID-19, digital financial services, digital divide, digital transformation, digitalisation, digital economy, mobile banking, higher education, entrepreneurship, financial services and financial knowledge.

Evolution of Themes

The thematic map represents how research themes have developed over five differing time periods, namely 2015-2018, 2019-2020, 2021-2022, 2023-2024, and 2025 as shown in Figure 6. Through a study of thematic change over a period, it reveals how new research topics come into focus, how traditional topics fade, and how ideas about digital financial literacy change.

The themes for the initial period (years 2015 to 2018) are digital literacies and literacy, marking the early stages of concept development for digital competence. These themes are also prevalent in the second period (years 2019 to 2020), signifying continuous research interests. The third period (years 2021 to 2022) sees the inclusion of themes such as financial services, electronic money, and finance, marking the transition towards application-level research. The fourth period (years 2023 to 2024) signifies the development of increasingly complex themes such as decentralised finance, along with financial literacy and e-learning, marking the assimilation of fintech innovations and digital education. Lastly, the final period (year 2025) marks the consolidation of themes decentralised finance and literacy, signifying the ever-increasing interface of digital competence with fintech innovation.

To assess the conceptual maturity and relevance of themes in digital financial literacy research, a strategic thematic map based on centrality and density is presented in Figure 7.

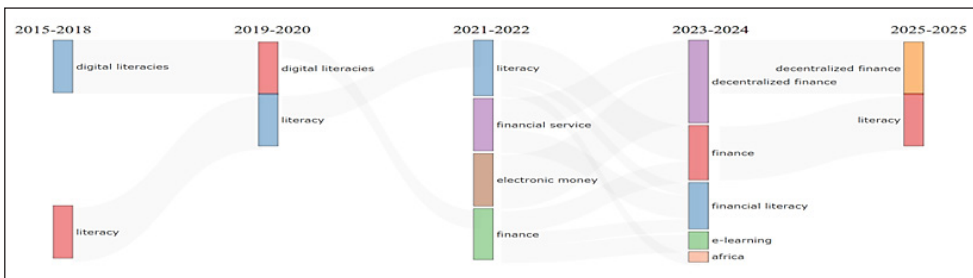


Figure 6. Thematic Evolution of Digital Financial Literacy

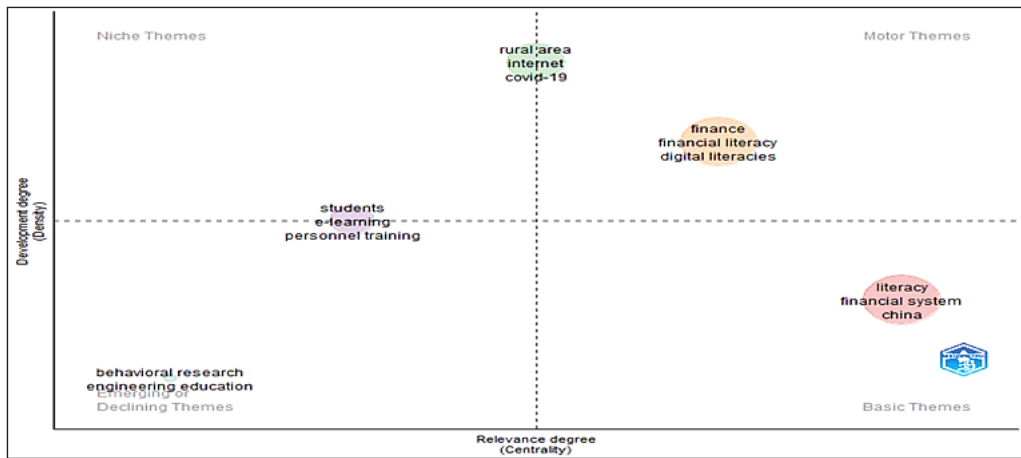


Figure 7. Strategy Map

Strategy Map

The thematic map shows that finance, financial literacy, and digital literacies act as motor themes in the graph, which are distinguished for their high density and central value, pointing to their prime significance in the subject area that has received considerable attention from academia. On the contrary, themes like the internet, rural areas, and e-learning are identified as niche themes in the graph, which receive high levels of internal development but are less interconnected to the subject area itself. Behavioural research, engineering, and education are identified in the quadrant III area, acting as themes that are either newly emerging or potentially declining. Lastly, the basic themes in Quadrant IV involve literacy, financial systems, and China, which act as basic yet less developed areas that support the subject area of digital financial literacy.

Conceptualisation and Measurement of Digital Financial Literacy

There are growing literature which is combining the digital literacy and financial literacy from incorporating the DFL. In this digital era, it is gaining importance, that the DFL is essential in making financial decision and to use the Digital Financial Services.

Content Analysis

For content analysis, 119 Articles from Scopus Database has been selected after filtration, that helped in identifying the Antecedents and outcomes of the DFL as indicated in Figure 8.

Antecedents

Antecedents are the factors that influence the development of digital financial literacy and act as the foundational influences on the engagement of individuals with

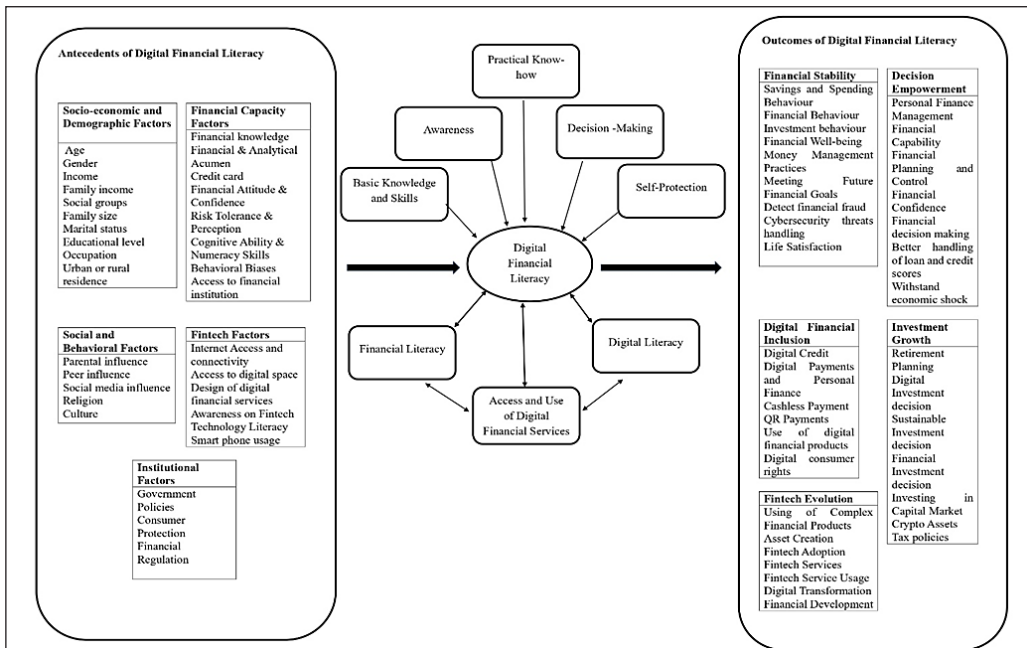


Figure 8. Conceptual framework developed from reviews

digital financial services. Socio-economic variables (Setiawan et al., 2022) such as age, gender, marital status, place of residence, income, occupation, educational attainment, family size, religion, and social group affiliation. These also include institutional factors such as access to formal financial services, awareness of financial knowledge, ownership of bank accounts and credit cards, and financial and analytical knowledge, which act as a significant predictor of digital financial literacy (Kumar et al., 2023).

Besides, social and behavioural influences stand significance. Key factors include parental influence, peer influence and social media influence, which, within a broader perspective, are considered as important societal determinants in shaping digital financial literacy (Adnan et al., 2023).

Social media is also being recommended as a strong predictor (Subburayan et al., 2023). Fintech awareness and acquiring the related digital skills further improve individuals' capability to make more effective use of digital financial services (Amnas et al., 2024). In addition to that, the access to and availability of infrastructures leading to digital spaces (Csizsarik-Kocsir & Lentner, 2023), the design, and usability of digital financial services (Zhang, 2021) has a great impact on building up and practicing financial literacy in a digital way.

Decision

In the ADO framework, the decision dimension represents how digital financial literacy is conceptualised and operationalised within the empirical research. Digital

financial literacy (Miranti et al., 2024) has been conceptualised as an integrated construct that encompasses digital literacy, financial literacy, and the proper use of digital financial services (OECD, 2024). Many studies capture DFL in terms of its higher-order dimensions, such as financial literacy, financial capability, and digital literacy, as measured separately (Ravikumar et al., 2022). Practical knowledge of personal finance and one's ability to make appropriate financial decisions have also been highlighted as core aspects of DFL measurement (Lyons & Kass-Hanna, 2021a). Recently, a study has extended this concept even further by including other measures like basic and advanced digital financial knowledge, digital financial attitudes, and digital financial behaviours, thereby presenting a much broader conceptualisation of the way digital financial literacy can be operationalised (Chhillar et al., 2024).

Outcomes

The principal results or effects associated with the knowledge of digital financial literacy (DFL) are found in the positive changes in the subject's overall financial practices and their improved financial conditions. The adoption and application of DFL lead to the display of prudent behaviour in finance (Özyeşil & Tembelo, 2025), prudent budgeting, and prudent financial behaviour (Respati et al., 2023). People who show stronger awareness and understanding about DFL display more prudent saving and spending behaviours (Islam & Khan, 2024), which in turn enables them to allot

their finances in the most optimal manner for short-term and long-term requirements alike (Rahayu et al., 2024).

Digital financial literacy is also an important aspect that contributes to overall financial well-being by enabling effective money management behaviours (Choung et al., 2025), financial planning, and financial control, as well as financial self-confidence (Nurkholik, 2024). These skills will empower people to handle complex financial products effectively, as well as make right financial decisions (Bhat et al., 2024). Another aspect that is promoted by DFL is financial capability, enabling digital financial inclusion (Mandal et al., 2022), digital payments, digital credit, and personal financial management (Lo Prete, 2021).

As the volume of digital payments increases, the use of cashless payments, as well as QR code payments (Shehadeh et al., 2024), also supports informed investment decisions, including investment in digital investing (Mishra et al., 2024) as well as sustainable investing (Aristei et al., 2024). Higher degrees of DFL will also result in greater participation in capital markets as well as new asset classes such as cryptocurrencies (Gaol et al., 2023). On a broader dimension, DFL promotes digital change in the financial lives of individuals by using fintech (Teslenko & Maslakova, 2024), thereby leading to financial development (Ardini et al., 2024).

In order to determine the emerging areas of research in the area of digital financial literacy Figure 9 represent the overlay visualisation.

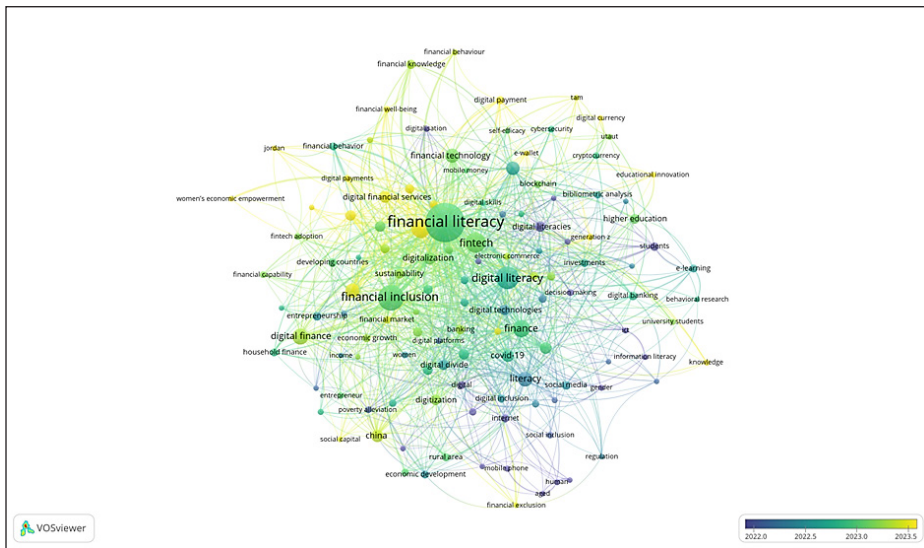


Figure 9. Overlay Visualisation

Emerging Areas of Research

The use of overlay visualisation involves the use of colour gradations in distinguishing different time periods when exploring emerging topics. The co-occurrence approach allows an understanding of how research topics grow over time and thus responds to the second research focus. Some of the themes identified in early 2022 include mobile phones, social inclusion, internet, digital technologies, information literacy, decision-making, and digital literacies, which seem to focus on access and basic digital competences in their early stages. Later in 2022, topics included in research include digital divide, digital technologies, literacy, social media, digital literacy, entrepreneurship, blockchain, and household finance.

Beginning early 2023, the literature moved on to finance topics, focusing on

financial literacy, fintech, and financial inclusion, accentuating the complementarity of financial capability and digital platforms. Approximately mid-way through 2023, the research on digital financial literacy, digital financial inclusion, digital payments, digital financial services, digital currency, mobile banking, and financial well-being dominated the literature, indicating that the area was progressing towards application and result-oriented research themes.

Discussion

In the fintech-driven economy, digital financial literacy (DFL) has emerged as a foundational capability for effective participation in digital financial systems. Although access to digital financial services has expanded globally, levels of DFL remain uneven across populations. Importantly, enhanced access does not

automatically translate into higher digital financial literacy; insufficient DFL caused vulnerability to digital fraud, coercive practices, and financial mismanagement. Existing research has largely emphasised demographic determinants, whereas comparatively limited attention has been paid to cognitive and behavioural drivers, such as financial trust, self-regulatory capacity, and psychological capital.

The rapid evolution of fintech innovations including chatbot-based financial advisory services, crypto-assets, and deferred payment instruments such as 'Buy Now Pay Later' has further complicated financial decision-making. Individuals possessing conventional financial literacy often struggle to navigate these digitally mediated environments, underscoring the need for literacy frameworks that integrate behavioural and technological competencies. Future research should therefore adopt longitudinal and experimental designs to capture behavioural adaptation and learning effects over time. Moreover, DFL interventions must extend beyond individual capability building to encompass regulatory design and digital infrastructure training, which vary significantly across national contexts and critically influence digital financial outcomes.

Future research agenda:

From the literature the following themes are identified as future research agenda answers the third question.

1. The behavioural and psychological factor:

As indicated in the figure 9, there are many psychological and behavioural factors that contribute to the DFL of an individual. As influence of external factors are increased in the digital age (L. Damayanti et al., 2021), having huge impact in deciding the ability of the individual. The psychological factors also play an major role, as the aspects such as fear of missing out, encourages them to get updated and keep in pace with the technology (Thankachan et al., 2024). The behavioural biases and cognitive biases also influence the digital financial literacy, financial risk bearing capacity and behavioural intervention are also areas to be focused in the future research.

2. Digital financial literacy and inclusion among the under privileged: Financial inclusion is the efforts taken to serve the financial products to the unserved section of society (Bongomin et al., 2024), as the DFL act as key to improve the digital financial inclusion, as the increased penetration of smart phone usage and internet even among the lower section community (Zhang, 2021) increases the demand for the DFL, allowing the low income groups and rural population to use the digital financial services. As research can be focused on digital readiness among the underprivileged section of the society.

3. Sustainable digital investment in FinTech:

In the digital age, the role of financial influencers is also increasing, increased DFL enable them to analyse and take better financial decisions, and invest in the capital market, and other various investments like crypto assets. The option of diversifying the investments in the digital platforms exercised by the investors also to be focused on the future research.

Theoretical Implication

This review extends in providing a detailed framework in determining framework for the DFL, as the previous study focused majorly on the bibliometric analysis and the structured review, as no study has taken effort in determine the Antecedents and Outcomes of the DFL. This study adds to the existing literature, by determining the different clusters of DFL and the conceptual understanding of factors influencing the DFL, as this conceptual framework, enables the future researcher to undermine the relationship and test the implication. Further scales can be developed for each framework. The conceptual framework and the factors are evidenced by the reviews, and this highlights the potential theoretical contribution.

Practical Implication

The research offers excellent insights into the determinants of digital financial literacy (DFL) among consumers in a rapidly digitalised financial system. As smartphone penetration expands, consumers have better access to online banking,

investment platforms, and digital payment services. The research underscores the fact that financial capacity is a key determinant of augmenting DFL, as those who are financially literate exhibit higher confidence and acquaintance with digital financial services and instruments. Additionally, combining digital literacy with financial literacy enables easier adoption of digital financial channels, leading to overall financial inclusion.

Another crucial aspect is being conscious of cyber threats and electronic fraud, something that is still low among some user groups. Unaware individuals are subject to digital arrest, a term in this context referring to instances where users' financial liberty or integrity is limited by digital monitoring, scams and phony controls. Thus, national and organisational efforts need to work not only on building DFL but also incorporate holistic training on cybersecurity as well as healthy digital behaviour.

At the policy and institutional level, the paper provides actionable implications for policymakers, educators, and financial institutions. Policymakers can design DFL programs for underprivileged and digitally excluded communities. Educational institutions can integrate DFL modules into commerce and management courses so that students can acquire conceptual and technological knowledge. Financial institutions, especially banks and fintech companies, can use the antecedents–outcomes framework of this study to create customer-designed interventions

that encourage responsible digital financial conduct.

Future studies should expand the present model to various socio-economic and cultural contexts, incorporating cross-country comparisons to elucidate how contextual influences shape DFL outcomes. Such extensions have the potential to further enhance the understanding of how behavioural, financial, and technology antecedents interact with each other to enhance individuals' digital financial abilities worldwide.

Limitation

This study, though it covers a major aspect of determining the ADO Framework, the study also has limitations, as the studied is based on the data collected from the Scopus database, the co-occurrence analysis and network analysis does not include the data that are indexed in other databases. Realising the pitfalls of keyword search approaches, other precautions were also employed to reduce retrieval bias. Synonyms and synonymous terms for the focal constructs were pilot tested to improve recall. The study, however, admits that keyword searches might miss pertinent articles using different verbiage, an incomplete limitation on the comprehensiveness of the study.

This provides way for the future researchers to collect data from the other database and carry out a detailed structured study, and also this study has adopted only the ADO framework to study the antecedents, decision and outcomes, as other frameworks including, TCCM (Theory, Context, Characteristics and

Methodology), 5W +1H (Who, When, Where, How, What and Why) framework also known as 6W framework, IMO (input, moderator, outcome) framework ADO-TCM (antecedents, decision and outcomes – theory, context and methodology) can also be used to for impactful literature review (Paul et al., 2024) and this literature is study of the Articles that are already published, and the future studies can be carried as an empirical studies. The TCCM framework could further highlight underexplored theoretical or contextual dimensions, while IMO could capture dynamic mediating processes within the reviewed literature. Future reviews may employ these models to enrich reflexivity and triangulate insights derived from the present analysis.

CONCLUSION

The proposed work offers a clear theoretical contribution in the existing literature of digital financial literacy (DFL) through the development of a theory-driven synthesis approach based on the model of Antecedents-Decisions-Outcomes (ADO). Unlike existing literature in the form of theoretical reviews, where the focus of existing works was merely on listing themes and trends along with existing influential works, the proposed contribution combines elements of bibliometric synthesis with theoretical structuring to determine the way and reasons for which the phenomenon of digital financial literacy occurs through a series of interconnected paths.

This research offers a synthesis explanation consistent with a theory where structural antecedents shape the outcome of

human decision-making which includes the social, demographic and behavioural factors, financial capacity, FinTech and institutional factors. This research positions a study of financial literacy in a comprehensive and consistent framework that can be measured using the components that combine financial literacy and digital literacy with the access and use of digital financial services.

The findings offer key actionable insights for policymakers, educators, and financial institution stakeholders. Findings are applicably used as a diagnostic aid within the ADO framework, forming a basis for intervention activities that include developing behavioural pushes within digital financial education programs, increasing trust within financial institutions, and adapting fintech development according to the user capability level. These are especially useful emerging market economies where digitalisation is accelerating beyond financial capability upgrade with the financial stability, Decision empowerment, digital financial inclusion, investment growth and fintech evolution.

This conceptual framework gives better understanding about the digital financial literacy. Thus, determining the future research agendas relating to influence of behavioural impact, and to focus on the sustainable digital investment for the under privileged section of the community, as they are excluded from the access and usage of digital financial services.

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Untangling the Moderating Effects of Financial Literacy on OCC Adoption Among Chinese Emerging Adults

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ABSTRACT

The financial well-being of Emerging Adults (EAs) has long attracted scholarly attention, and the rapid expansion of OCC exposes them to structural risks that may ultimately undermine both their individual financial well-being and the stability of society. This study integrated financial literacy into the Theory of Planned Behaviour (TPB) framework to examine the mechanisms underlying Online Consumer Credit (OCC) adoption among Chinese EAs. Questionnaires were collected online through the Wenjuanxing platform, and 609 were valid. The findings revealed that attitudes, subjective norms, and perceived behavioural control positively influence EAs' intention to use OCC, with intention serving as a key mediator between these antecedents and subsequent behaviours. Financial literacy moderated the intention-behaviour relationship, with higher levels of financial literacy weakening the link between people's intention to adopt OCC and their actual usage. Moreover, subjective financial literacy exerted a stronger moderating effect than objective financial literacy. These results provide important implications for financial education initiatives. While objective

knowledge is indispensable, confidence in one's ability to make sound financial decisions may play a more decisive role in shaping life-long financial well-being. Future studies are recommended to explore additional moderators that may guide prudent OCC consumption and to localise research instruments for use in different cultural contexts.

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Keywords: Emerging adults, financial literacy, fintech, objective financial literacy, online consumer credit, subjective financial literacy, TPB

INTRODUCTION

The financial well-being of Emerging Adults (EAs) is a central concern in economics and family studies since decisions in this transitional stage carry lasting effects throughout their lives (Hochberg & Konner, 2020). With the rapid expansion of Online Consumer Credit (OCC), EAs are exposed to structural risks due to their financial dependence and low level of financial literacy, which may undermine their financial well-being, household resilience and, ultimately, social stability (Dwyer & DeMarco, 2024; Lusardi et al., 2010; Sabri & Zakaria, 2015).

In China, the 2010s saw a swift expansion of the internet economy and the rise of non-bank OCC products that in some segments supplanted traditional bank lending (Barnett et al., 2022). OCC refers to unsecured credit evaluated by internet-based financial institutions using big-data scoring and disbursed via FinTech platforms (Dong et al., 2023). The ease of access, wide usage scenarios, frictionless payment and intensive promotions have normalised “buy-now-pay-later” practices, shaping attitudes and everyday borrowing behaviours in the FinTech era (Jiang & Zhou, 2020).

EA refers to young people between the ages of 18 and 29 (Hochberg & Konner, 2020). Despite attaining the legal age of adulthood at 18, they have yet to achieve a sufficient level of maturity regarding economic, psychological, and even physiological development (Arnett, 2006; Wood et al., 2018). OCC products, represented by Ant Huabei and Jingdong

Baijiao, have significantly infiltrated the lives of Chinese EA consumers. A Nielsen report indicates that the penetration rate of OCC among youth is as high as 60.9 percent (Xie et al., 2021). The OCC provides chances for EAs to amass seed capital; yet some EAs fail to manage their borrowing practices well, resulting in anxiety, financial difficulties, estrangement from their families, and even suicidal ideation (Xu et al., 2023).

A significant disparity exists between the swift advancement of fintech and the financial literacy of the populace in China. Despite being the country with the greatest fintech penetration rate globally at 87 percent, the overall financial literacy level of people is concerning (S. Liu et al., 2023; Yoshino et al., 2020). A deficiency of financial literacy frequently results in an inability to make advantageous financial decisions, preventing customers from fully enjoying the benefits of OCC products (Khan et al., 2023). Financial literacy significantly impacts not only consumers’ capacity to make sound short-term decisions but also their ability to make long-term choices that influence their overall well-being (L. Liu & H. Zhang, 2021). The emerging generation, EA, is poised to take the responsibility of contributing to the economic development, and their financial well-being is essential for the stable development of the whole society (Ranta et al., 2020). Therefore, it is imperative to examine the influence of financial literacy on EA’s use of OCC to provide more insight to individuals, families, government, and institutions for better understanding and regulating EA’s behaviour.

Based on previous literature, the prevailing interest in OCC customer behaviour in EA predominantly examines it from a viewpoint of marketing, consumer behaviour, and technology acceptability (Barnett et al., 2022), only a limited number of studies have explored the rationale behind OCC adoption activity from the users' perspective, and even fewer have investigated the moderating effect of financial literacy in this setting. In these limited investigations of the moderating influence of financial literacy, most authors have conflated subjective and objective financial literacy as a singular entity, thus overlooking the distinctions between them (Morgan & Trinh, 2020). The necessity of testing subjective and objective financial literacy separately arises from their frequent mismatch, often illustrated by the Dunning–Kruger effect, in which individuals with high subjective literacy overestimate their actual ability (Allgood & Walstad, 2016 ; Xin et al., 2024). Conflating the two may therefore misguide policymakers. Identifying these differences is essential for targeted policy design: while objective literacy should be strengthened through systematic and long-term education, subjective literacy requires greater emphasis on psychological guidance and can be enhanced more immediately (Gerrans et al., 2025). Consequently, this study will address the deficiency in prior empirical evidence regarding EA's OCC usage behaviour and will investigate the differential impact of subjective and objective financial literacy on the moderating relationship between

EA's OCC intention and behaviour, thereby providing targeted recommendations for government and institutions to improve individuals' financial behaviour.

LITERATURE REVIEW

Online Consumer Credit

Online Consumer Credit (OCC) is a product that utilises a big data system backed by internet companies, leveraging users' prior online transaction histories to assess creditworthiness and ultimately provide a credit quota via the Internet. It emphasises a 310 experience: three minutes to apply, one second to receive funds, and no human intervention (Kshetri, 2020). China's Ant Huabei can be considered the originator of OCC products (Barnett et al., 2022). Relying on the influence of the widely spread Taobao website and the powerful Alipay e-wallet system, Ant Huabei quickly gained millions of users at the time of its introduction (Hau et al., 2019; Shi, 2020). After Ant Chanting broke through, China's overall OCC market has shown vigorous vitality. Alongside Ant Huabei, a range of OCC products backed by their robust Internet parent company, including Jingdong Baitiao, Baidu Duxiaoman Finance, Tiktok Monthly Payment, and the Meituan Credit Card, have swiftly permeated Chinese people's daily life, integrating themselves into the spheres of food, clothing, housing, transportation, and entertainment (W. Liu et al., 2021).

For Chinese EA, utilising OCC may be regarded as an act of last resort when facing financial distress. The traditional

financial system is hierarchical, highlighted by significant entry barriers, and all services depend on the user's assets, hence privileging large firms and high net worth groups with considerable financial resources over economically disadvantaged individuals in credit market (McDonald & Dan, 2021). Moreover, in 2009, banks suspended the provision of credit card products to Chinese university students, consequently excluding the EA group from China's credit market due to their absence of stable job, fixed assets, and a recognised social status (Li et al., 2019). A prolonged absence of lending options for economically marginalised people remained, leading to the creation of OCC as a viable solution for the credit requirements of EA's in China (C. Zhang et al., 2021). The OCC's low threshold, rapid speed, and diverse applications can serve as an effective alternative to conventional credit cards, enabling persons marginalised by the existing financial system to access equivalent credit chances as bank credit users. Due to this, OCC is increasingly attracting EA users in China (J. Zhang et al., 2022).

Emerging Adults

Despite that there is no common standard for the age range of Emerging Adults (EA), scholars are all in agreement that, even though EAs have achieved the legal adult status at the age of eighteen, they are not genuinely adults from a societal, economic, and physiological perspective (Arnett, 2006). In terms of biology, scholars argue that the human brain's maturation does not reach its full potential until around the age

of 30 (Wood et al., 2018). This means that even at the age of 18, individuals need more than a decade to develop their cognitive frameworks and societal comprehension, during which time they will refine and improve their behavioural patterns to better adapt to their surroundings (Rudling et al., 2023). Additionally, academics argue that the attainment of sexual maturity or reaching a specific age does not necessarily indicate adulthood (Mazelis & Kuperberg, 2022). "Adulthood" is primarily a social concept, defined by the establishment of a new identity and the dissolution of familial ties. This is exemplified by transitions such as the transition from singlehood to marriage, from childhood to parenthood, from economic dependence to independence, and from reliance on parental guidance to independent decision-making (Arnett, 2006).

Secondly, certain scholars argue that financial independence is a critical determinant of human development. However, for numerous EAs, the process of achieving financial autonomy beyond the age of eighteen and establishing what is considered "actual adulthood" is extremely challenging (Mazelis & Kuperberg, 2022). On the one hand, the spread of higher education has resulted in a delay in the entrance of many EAs into society, and their financial independence is thus delayed (Arnett, 2006). Furthermore, because of their lack of work experience and life skills, EA encounter more work-related obstacles than their elders, which complicates their pursuit of financial independence (Wood et al., 2018.). For example, a Danish social survey revealed that the unemployment rate

and risk of labour market marginalisation are highest among young individuals aged 25-29 in Denmark (Jensen et al., 2020).

As individuals approach adulthood, they often encounter intricate financial challenges that may have a lifelong impact. During difficult life transitions, many EAs choose to use OCC products to alleviate hardship and better invest in themselves (Dwyer & DeMarco, 2024). However, some of them get themselves into a lot of trouble due to high-risk OCC behaviours, which puts them in greater financial crisis and further hinders their progress towards true adulthood (Ranta et al., 2020). The economic behaviours of EA impact not just their current financial status but also dictate their future economic prosperity. Most of the pivotal occasions in an individual's life transpire during people's emerging adulthood (Wood et al., 2018). In the current OCC era, to mitigate EAs' financial uncertainty during this transitional period, it is essential to analyse the OCC adoption patterns of EAs to offer insights that may enhance their behaviour.

The Theory of Planned Behaviour

Ajzen developed the Theory of Planned Behaviour (TPB) in 1985. This theory posits that attitude, subjective norms, and perceived behavioural control collectively forecast individuals' intention to engage in a behaviour, with intention regarded as a direct precursor to actual behaviour (Ajzen & Madden, 1986). TPB has remained an indispensable concept in the social sciences since its establishment and has been extensively utilised in Fintech consumption

research (Cao et al., 2023; Raj et al., 2023; D. Zhang et al., 2023). Despite its utilisation for decades, TPB has faced a lot of criticism regarding its validity, with some scholars arguing that it functions more as an inescapable paradigm within the social sciences than as a practical and effective instrument that researchers have judiciously aligned with real-life situations (Sniehotta et al., 2014). Thus, this research augmented the TPB model to include financial literacy as a moderating variable, fitting the context that most Chinese EAs are with limited financial literacy (L. Liu & H. Zhang, 2021; Peng et al., 2022).

Attitude

Attitudes (AT) are the overall evaluations of performing the behaviour by the individual (Rhodes & Courneya, 2003). It refers to individuals' affective (e.g. enjoyable/unenjoyable) and instrumental (e.g., beneficial/harmful) evaluations toward a behaviour (Sparks et al., 1997). Fishbein and Ajzen (1972) assert that attitudes are connected to an individual's overall intention or action regarding an object. Empirical investigations have demonstrated that attitudes positively influence users' intention to engage with OCC. For example, in a study of the mechanisms of OCC use in India, researchers found that attitude predicted more than half of consumers' intention to use OCC (Kumar & Nayak, 2024). Attitude accounted for nearly half of the variance in intention to use OCC among Chinese university students, according to a study conducted by D. Zhang et al. (2023).

Therefore, this study hypothesises that,

H1: Attitude towards OCC adoption will positively influence EA's Intention to use OCC.

Subjective Norm

Subjective Norms (SN) refers to personal assessment of the social pressures regarding conducting a particular behaviour (Rhodes & Courneya, 2003). The actor's intention to engage in a behaviour may be encouraged if they believe that the outer environment supports their activity (Ajzen, 1985). The ability of subjective norms to predict intentions was also verified in OCC context. Research conducted on Chinese OCC consumers revealed that SN substantially predicted the intention of nearly half of customers to utilise OCC (D. Zhang et al., 2023). In a cross-cultural context, the intention to utilise OCC is also significantly influenced by subjective norms. In an Indian investigation of the adoption behaviour of OCC among undergraduate and postgraduate students, demonstrated that 37.6% of the intention to use OCC could be predicted using subjective norms (Raj et al., 2023).

H2: SN for OCC adoption will positively influence EA's Intention to use OCC

Perceived Behavioural Control

According to Ajzen and Madden (1986), perceived behavioural control (PBC) is the perceived ease or difficulty of performing a behaviour by individuals. It has been shown to be influenced by past experiences, as well as anticipated impediments and

obstacles. Additionally, PBC is frequently employed to speculate on an individual's actual capacity to act. Individuals evaluate their ability to complete an event based on their psychological perception of their personal capabilities and resources, which is frequently indicative of their actual control. When perceived control is stronger, the individual's intention to execute the behaviour in question is also increased (Bosnjak et al., 2020). In OCC context, a study conducted in northern China revealed that the PBC of OCC use used by consumers predicted over one-third of their OCC use intention (D. Zhang et al., 2023). Therefore, this study hypothesises that

H3: PBC for OCC adoption will positively influence EA's Intention to use OCC.

Intention

Intention is intrinsically linked to behaviour; it serves as the precursor to all actions (Ajzen, 1985). A person's intention to act resembles a form of determination; that determination compels the individual to undertake the anticipated action when the appropriate circumstances arise (Gollwitzer, 1993). Consequently, intention has been identified as a crucial determinant of conduct in prior research. A study investigating an online health community application revealed that the intention to use explained 89.5% of usage activity (Cao et al., 2023). The robust association between PBC and intention is also evident in OCC adoption, as Irimia-Diéguez et al. (2023) determined that the intention to utilise an OCC

predicted 78.2% of usage behaviour. Consequently, we postulated that

H4a: Intention to use OCC influences EA's final OCC adoption.

Scholars suggest that without the mediating role of intentions, all ideas (e.g. attitudes, subjective norms) are only floating in the air, and it is only when they are blended to form a specific intention that those nebulous ideas are given meaning and ultimately have a substantial impact on human behaviour (Armitage & Christian, 2003). Thus, intentions are often seen as mediators between those abstract emotions and figurative actions. Consequently, intentions are frequently regarded as mediators between abstract emotions and concrete actions. This relationship is frequently verified in the previous empirical research. For instance, in the study by Ma and Yao (2023), researchers discovered that PBC contributed to 11.3% of usage behaviours, while PBC did not exert a significant direct effect on behaviour. In another investigation of podcast usage in Africa, researchers discovered that intention fully mediated the relationship between people's attitude, subjective norm and perceived behavioural control towards their podcast use and their final behaviour (Ifedayo et al., 2021). Thus, this study hypothesises that:

H4b: EA's Intention mediates the relationship between EA's Attitude and their OCC adoption

H4c: EA's Intention mediates the relationship between EA's Subjective Norm and their OCC adoption

H4d: EA's Intention mediates the relationship between EA's Perceived Behaviour Control and their OCC adoption

Financial Literacy

The term literacy primarily denotes theoretical comprehension; however, financial literacy encompasses not only the acquisition of financial knowledge but, more crucially, the capacity to make advantageous financial decisions (Huston, 2012). Consequently, in order to effectively navigate the financial marketplace and prevent costly financial errors, it is necessary to possess financial literacy (Amagir et al., 2020). Financial literacy consistently functions as a critical moderating factor in various kinds of relationships within the financial practice domain. Yang et al. (2018) conducted a study that investigated the financial decision-making authority of leaders and found that financial literacy significantly impacted the relationship between risk management practices and competitive advantage. Specifically, managers with higher financial literacy achieved a more significant competitive advantage in risk management than their less financially literate counterparts. Additionally, it was discovered that the relationship between the growth of SMEs and access to finance is moderated by financial literacy. The researchers discovered that during periods of digital transition, individuals who possess a high level of financial literacy are more likely to employ fintech solutions, which finally contribute to the SME developments

(Hidayat-ur-Rehman, 2024). Thus, we hypothesises that

H5a: Financial Literacy moderates the relationship between intention and behaviour for OCC adoption.

Scholars have categorised financial literacy into subjective and objective categories for further investigation (Xiao & Porto, 2017). Objective financial literacy pertains to consumers' theoretical comprehension of financial knowledge and their capacity to apply it, while subjective financial literacy pertains to individuals' awareness of their financial knowledge and their self-efficacy to engage in financially advantageous behaviours (L. Liu & H. Zhang, 2021). Scholars have consistently emphasised that financial literacy should not only include objective financial knowledge and abilities, but also the degree of subjective confidence in one's ability to engage in actions that improve financial well-being (Adam et al., 2017; Khalisharani et al.,

2022). Subjective and objective financial literacy have varying degrees of influence on the financial behaviour of individuals. Prior empirical research has suggested that subjective financial knowledge or confidence may have a more substantial impact than objective financial knowledge on both long-term and short-term financial behaviours (Diem et al., 2023). Also, subjective financial literacy has been empirically shown to have a slightly greater impact on budgeting than objective financial literacy (Amagir et al., 2020). Thus, this study hypothesises that

H5b: Objective Financial Literacy has a moderating effect in the relationship between intention and behaviour.

H5c: Subjective Financial Literacy has a moderating effect in the relationship between intention and behaviour.

Following the aforementioned hypothesis, the conceptual framework for this study is illustrated in Figure 1.

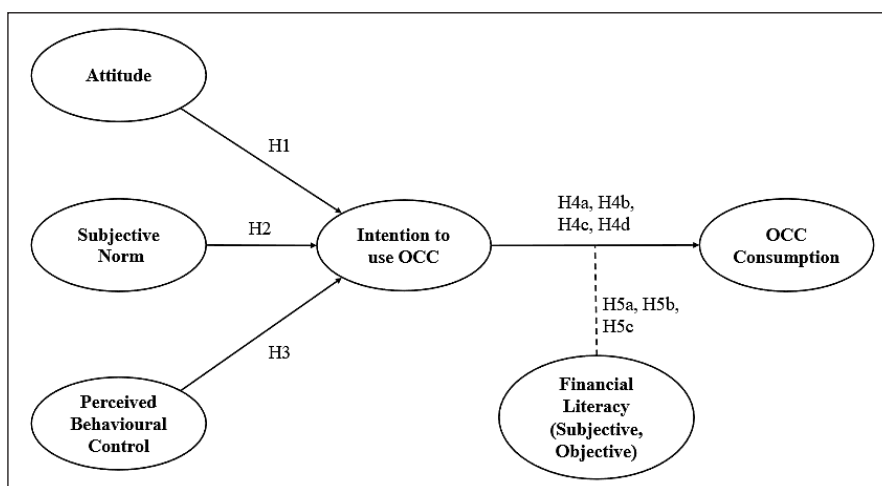


Figure 1. Conceptual framework

METHODS

Measurement

A questionnaire was developed to assess the variables in the study, with items modified from prior empirical research. The measurement of the variables attitude, subjective norm, perceived behavioural control, intention, and behaviour from the Theory of Planned Behaviour comprises questions adapted from Ajzen's recommendations while also integrating the OCC context (Cloutier & Roy, 2020). This investigation for Objective Financial Literacy employs items from Houston's survey on student financial literacy (Houston, 2012), whereas subjective financial literacy consists of a compilation of items evaluated in several previous empirical studies (L. Liu & H. Zhang, 2021). The study employed a five-point Likert scale to capture subjective views, which is likely to produce normally distributed results (Taherdoost, 2019). The scale ranges from one to five, representing "strongly disagree", "disagree", "neither agree nor disagree", "agree", and "strongly agree".

Sampling Techniques

A nationwide survey is neither feasible nor analytically desirable due to the huge EA population and the uneven OCC development (Jiang et al., 2024; Kang et al., 2025), thus, Shandong Province was selected as the sampling site. First, Shandong has a leading OCC market in China, indicating a substantial user base (Song & Appiah-Otoo, 2022). Secondly, its sectoral composition has closely aligned with the national

industrial profile. Approximately 7% of provincial GDP derives from agriculture, about twice the agricultural share observed in metropolises such as Beijing, Shanghai, the Yangtze River Delta and the Pearl River Delta (Kang et al., 2025; Ma et al., 2025). This alignment enhances external validity and generalisability by capturing respondents from less developed areas engaged in lower skill production, and thus provides more inclusive perspectives for policymakers to better understand EA's OCC usage patterns.

This study adopted quota sampling due to the absence of a complete sampling framework (Ochoa & Porcar, 2018). In line with Bryman (2016), and because city-level EA counts were unavailable, quotas were allocated to prefecture-level cities in proportion to their shares of the provincial population. The quota assignment is illustrated in Figure 2.

Data Collection

This study was conducted using a self-administered questionnaire distributed via Wenjuanxing, a Chinese internet survey platform. The online strategy improved effective data collecting while reducing researchers' financial burdens (Evans & Mathur, 2018). Furthermore, the self-administered approach allows respondents to complete the survey independently, avoiding any biases caused by the sensitivity of the topic to be investigated and interviewers' behaviour when doing research (Sheatsley, 1983). The Wenjuanxing link was released on WeChat, TikTok, QQ, Redbook, and

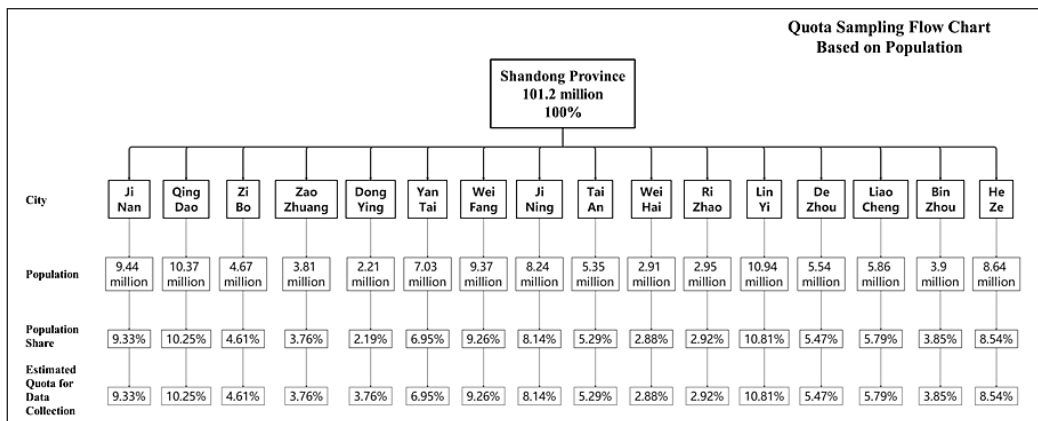


Figure 2. Quota sampling flow chart

Weibo. Before answering, two screening conditions were applied: respondents had to have used OCC previously and be between the ages of 18 and 29. Participants were informed that the survey was anonymous and only for research purposes, and that they may withdraw at any time without penalty. As an incentive, completion offered a chance to enter a lucky draw sponsored by the Wenjuanxing platform.

Researchers first assessed the time required to complete the questionnaire (10 minutes), thus excluding responses taking less than five minutes or exceeding ten minutes. Additionally, questionnaires exhibiting excessive consistency in responses (such as selecting “strongly disagree” for all items) and those originating from IP addresses outside Shandong Province were also excluded. Finally, 700 questionnaires were distributed, of which 609 valid responses were retained. Wenjuanxing’s integrated IP tracking system was used to verify the completion of the assigned quotas, and the overall

deviation was kept within 5%, consistent with accepted standards for sampling error in the literature (Etikan, 2019).

Data Analysis

Structural Equation Modelling (SEM) was used to analyse the data. SEM estimates latent constructs and their indicators through Confirmatory Factor Analysis, and tests directional relations among constructs through Path Analysis in a single framework (Cheng, 2001). This joint estimation improves efficiency and yields more reliable coefficients. Unlike ordinary regression or simple path analysis, SEM separates true score from measurement error, evaluates model fit, and handles complex structures such as multiple mediations and layered paths. By accounting for measurement error and indirect effects, SEM provides clearer evidence on the relationships among constructs that standard techniques often overlook (Jöreskog, 1978). This emphasises the real discoveries derived from the data itself rather than the perfect model fit (Musil

et al., 1998). Given that the theoretical model employed in this research has been repeatedly validated, and the objective of this study is to affirm the theory's application to the phenomenon under the Chinese EAs' OCC adoption context, CB-SEM is more appropriate for this study (Hair et al., 2019). The execution for data analysis will be conducted by AMOS.

PROCESS Macro was employed to test moderation effects. Although AMOS is effective for testing mediation and structural relationships, its fit indices are primarily designed for linear models and, in the case of moderation, only provide significance levels and path coefficients. As a result, the overall model fit and the strength of moderating effects are difficult to evaluate (Marsh et al., 2004). In contrast, PROCESS Macro provides R^2 and ΔR^2 , conditional effects, and a dataset for simple slope plots, which allow researchers to evaluate not only the moderation effect size but also the detailed moderation mechanisms (Hayes, 2018). It also centralises moderators automatically, improving efficiency compared to AMOS, which requires manual handling (Memon et al., 2019). Given this study's aim of comparing subjective and objective financial literacy as moderators, PROCESS complemented the SEM analysis and enhanced interpretability.

Test for Measurement Model

Prior to performing the path analysis, this study conducted the CFA to verify the robustness of the research model (Jöreskog, 1978). First, the robustness of

the measurement model is investigated, i.e. whether the measurements reflect the dimensions they intend to measure, and the results for indicator reliability (Hair et al., 2022), internal consistency (Cheng, 2001), convergent and discriminant validity (Fornell & Larcker, 1981) are as follows.

The CFA results in Table 1 indicate that all indicator loadings exceeded the recommended threshold of 0.70, except for a few items with loadings marginally below this level. These indicators were retained because their values remained above the minimum acceptable threshold of 0.40, and they provided important theoretical contributions to the measurement instruments (Hair et al., 2022). Composite Reliability (CR) for every factor is above 0.7, and Average Variance Extracted (AVE) for each construct is greater than 0.4 (Hair et al., 2019), the square root AVE of each construct in Table 2 is greater than the correlation coefficient of that construct with others (Fornell & Larcker, 1981), indicating a satisfied level of reliability and validity for the measurement model. At the same time, the tests of model fit, as shown in Table 3, satisfy the condition that the absolute fit index χ^2/df is less than 5 (Dash & Paul, 2021), Root Mean Square Error of Approximation (RMSEA) is below 0.10 (Musil et al., 1998), Incremental fit index of Comparative Fit Index (CFI), Tucker-Lewis's Index (TLI) values are both greater than 0.9 (Hu & Bentler, 1999), demonstrating that the research model can adequately explore the OCC usage mechanism in Chinese EA.

Table 1
Descriptive results for the measurement model

Construct	Items	IL (>0.4)	CR (>0.6)	AVE (>0.4)
Attitude	AT1	0.733	0.920	0.562
	AT2	0.772		
	AT4	0.787		
	AT5	0.717		
	AT6	0.716		
	AT7	0.75		
	AT8	0.736		
	AT9	0.78		
	AT10	0.754		
	Subjective Norm	SN1		
SN2		0.756		
SN3		0.796		
SN4		0.699		
SN5		0.731		
SN6		0.771		
SN7		0.752		
SN8		0.738		
SN9		0.76		
SN 10		0.757		
Perceived Behavioural Control	PBC1	0.718	0.921	0.539
	PBC2	0.744		
	PBC3	0.73		
	PBC4	0.695		
	PBC5	0.735		
	PBC6	0.706		
	PBC7	0.75		
	PBC8	0.752		
	PBC9	0.748		
	PBC10	0.763		
Intention	IT1	0.679	0.910	0.502
	IT2	0.704		
	IT3	0.717		
	IT4	0.661		
	IT5	0.712		
	IT6	0.722		
	IT7	0.729		
	IT8	0.728		
	IT9	0.705		
	IT10	0.722		

Table 1 (continued)

Subjective Financial Literacy	FL1	0.711	0.900	0.475
	FL2	0.751		
	FL3	0.729		
	FL4	0.711		
	FL5	0.750		
	FL6	0.756		
	FL7	0.744		
	FL8	0.703		
	FL9	0.724		
	FL10	0.743		
Behaviour	BH1	0.686	0.920	0.537
	BH2	0.706		
	BH3	0.688		
	BH4	0.674		
	BH5	0.667		
	BH6	0.689		
	BH7	0.722		
	BH8	0.723		
	BH9	0.664		
	BH10	0.67		

Note. IL, Indicator Loading; CR, Composite Reliability; AVE, Average Variance Extracted

Table 2
Fornell & Lacker's test for discriminant validity

	AT	SN	PBC	IT	SBFL	BH
AT	0.750					
SN	0.480	0.751				
PBC	0.567	0.496	0.734			
IT	0.493	0.468	0.501	0.708		
SBFL	-0.210	-0.159	-0.183	-0.185	0.689	
BH	0.506	0.479	0.491	0.504	-0.512	0.733

Note. AT = Attitude; SN = Subjective Norm; PBC = Perceived Behavioural Control; IT = Intention; SBFL = Subjective Financial Literacy; BH = Behaviour

Table 3
Test for model fit

Index	χ^2 /df	Df	RMSEA	CFI	TLI
Model Performance	1.609	1637	0.032	0.952	0.950
Criterion for Goodness of Fit	<5		<0.10	>0.9	>0.9

Note. df, Degree of Freedom; RMSEA, Root Mean Square Error of Approximation; CFI, Comparative Fit Index; TLI, Tucker-Lewis's Index

Test for Structural Model

Normality is an essential prerequisite for parametric testing; failure to meet this prerequisite may result in inferences that significantly diverge from the real circumstances (Orcan, 2020). Similarly, the issue of collinearity may also result in erroneous study outcomes (Mason & Perreault, 1991). Therefore, prior to conducting the path analysis, a normality and collinearity test should be performed. This study will assess normality through the examination of kurtosis and skewness, and the Variance Inflation Factor test will be conducted to measure the degree of collinearity. The data analysis results indicate that the kurtosis and skewness values are all below 1, signifying an adequate degree of normality (Kim, 2013), while the VIF values for each construct range from 1 to 2, well below the threshold of 3, reflecting a reasonable level of collinearity (Mansfield & Helms, 1982). Simultaneously, R^2 is utilised to assess the degree to which the dependent variable is explained by the independent variable. The R^2 value spans from 0 to 1, with elevated values signifying greater explanatory power; typically, an R^2 of 0.25 or above is regarded as medium

explanatory power (Hair et al., 2022). The findings indicate that intention and behaviour account for 35% and 29% of the variance, respectively, highlighting the robust explanatory capacity of the research model in this study.

RESULTS AND DISCUSSION

Direct Effects

Path analyses were performed using AMOS 26, and the results for direct effects are presented in Table 4. The data analysis results indicate that attitude ($\beta = 0.243$, $p < 0.001$), subjective norms ($\beta = 0.226$, $p < 0.001$), and perceived behavioural control ($\beta = 0.251$, $p < 0.001$) positively affected EA's intention to utilise the OCC product, consequently substantiating H1, H2, and H3 with empirical proof. Among the three factors influencing intention, subjective norms have a minimal effect, whereas attitude and perceived behavioural control exert a significantly stronger influence. This suggests that for EAs, their OCC use is predominantly governed by internal discretion rather than external impositions. The intention to utilise OCC significantly influenced OCC usage behaviour ($\beta = 0.202$, $p < 0.001$), hence supporting H4a.

Table 4
Results for direct effects

Hypothesis	β	S.E.	C.R.	P	Results
H1: AT \rightarrow IT	0.243	0.047	4.888	***	Supported
H2: SN \rightarrow IT	0.226	0.040	4.886	***	Supported
H3: PBC \rightarrow IT	0.251	0.049	4.976	***	Supported
H4a: IT \rightarrow BH	0.202	0.045	4.722	***	Supported

*** $p < 0.001$

Nonetheless, the restricted influence of intention on behaviour, relative to other paths in the research model, suggests that even with established intention, specific conditions may hinder the actual OCC adoption.

The mediating analysis is conducted using the integrated bootstrapping program in AMOS. As shown in Table 5, intention significantly mediated the relationship between attitudes, subjective norms, perceived behavioural control and their actual behaviour. The mediating effect of intention between attitude and behaviour was valued at 0.049 (SE = 0.017, $p < 0.001$), whereas the mediating effect of intention between subjective norms and perceived behavioural control was ($\beta = 0.042$, SE = 0.015, $p < 0.001$) and ($\beta = 0.052$, SE = 0.018, $p < 0.001$), respectively. The findings support H4b, H4c, and H4d. In the examination of mediating effects, this study discovered that, while prior TPB-based literature highlighted the significant

mediating role of intention, the findings indicated that this role was less pronounced. This may be attributed to the presence of additional moderating variables between intention and behaviour, or the influence of certain impulsivity-related variables that may disrupt the intention formation process, thereby directly motivating EA to engage in OCC adoption behaviour.

Moderating Effects

Utilising the Process Macro approach, the moderating effects of overall financial literacy, objective financial literacy, and subjective financial literacy were assessed, respectively and were numbered as model 1, model 2, and model 3. The study discovered that overall financial literacy, objective financial literacy, or subjective financial literacy significantly moderated the relationship between EA's intention to utilise OCC and final behaviour.

In model 1's investigation of the moderating influence of financial literacy,

Table 5
Mediating effects

Hypothesis	Path	Effect	Estimate	SE	bias-corrected 95%			Results
					Lower Bound	Upper Bound	p	
H4b	AT→IT→BH	Direct	0.162	0.051	0.063	0.261	0.002	Supported
		Indirect	0.049	0.017	0.021	0.089	0.000	
		Total	0.211	0.051	0.108	0.311	0.000	
H4c	SN→IT→BH	Direct	0.161	0.045	0.078	0.253	0.000	Supported
		Indirect	0.042	0.015	0.019	0.078	0.000	
		Total	0.203	0.045	0.118	0.297	0.000	
H4d	PBC→IT→BH	Direct	0.145	0.049	0.052	0.24	0.002	Supported
		Indirect	0.052	0.018	0.024	0.098	0.000	
		Total	0.197	0.05	0.101	0.297	0.000	

the interaction term Intention × Financial Literacy significantly predicted intention ($\beta = -0.179, SE = 0.028, t = -6.312, p < .001$), indicating that financial literacy substantially moderated the effect of intention on the dependent variable; therefore, H5a is supported. The model accounted for a total variance of 41.3% ($R^2 = 0.413$), whereas the inclusion of the moderating factor yielded $\Delta R^2 = 0.039$, signifying that the introduction of financial literacy enhanced the model’s explanatory capacity by nearly 4% (Table 6). Further simple slope analysis revealed that

the influence of intention on behaviour was more pronounced at lower levels of financial literacy and diminished at higher levels of financial literacy (Figure 3).

Conversely, when objective financial literacy is analysed independently from overall financial literacy, its moderating influence on the relationship between intention and behaviour towards OCC use is significantly diminished ($\beta = -0.129, SE = 0.032, t = -3.983, p < .001$), and the inclusion of objective financial literacy does not substantially enhanced model’s explanatory

Table 6
Moderating effect of overall financial literacy

Model 1	DV: Intention					
	Coefficient	SE	t	F	R ²	ΔR^2
Intention	0.361	0.032	11.303	141.829	0.413***	0.039***
Financial Literacy	-0.364	0.028	-11.210			
Intention × Overall Financial Literacy	-0.179	0.028	-6.312			

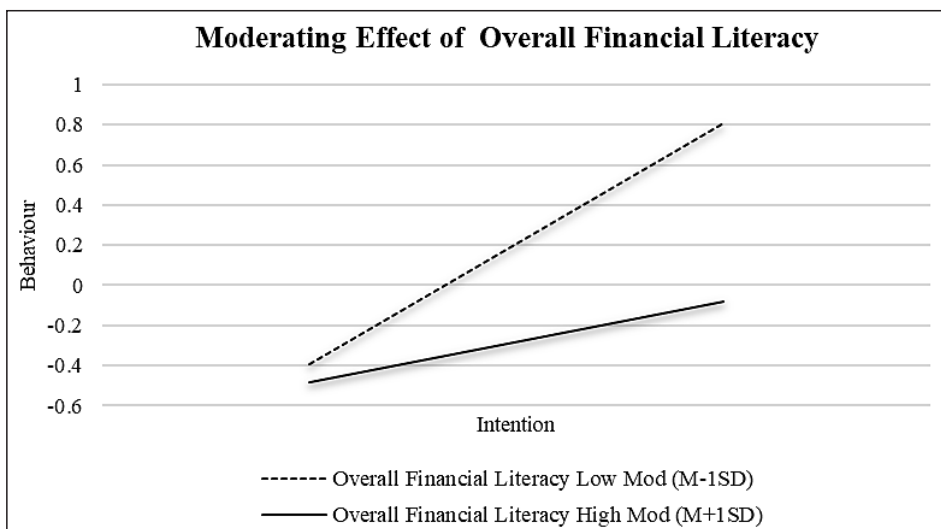


Figure 3. Simple slope plot for overall financial literacy’s moderating effect

power ($\Delta R^2 = 0.019$), which supports H5b (Table 7). Upon comparing the slope plots (Figure 4), it is evident that the slopes of the two lines exhibit considerable similarity for both groups with high and low financial literacy, demonstrating that their intention and behaviour regarding OCC usage are minimally influenced by their level of objective financial literacy.

H5c is also validated by the statistical evidence, and subjective financial literacy was shown to exert a greater moderating influence on the relationship between intention and behaviour in comparison to objective financial literacy ($\beta = -0.187$,

$SE = 0.029$, $t = -6.359$, $p < .001$), and the inclusion subjective financial literacy greatly contributed model's explanatory power ($\Delta R^2 = 0.040$) compare to objective financial literacy (Table 8). This influence can also be observed intuitively through simple slope plots, as illustrated in Figure 5, where the strength of the relationship between intention and behaviour varies significantly at different levels of supervisory financial literacy, with elevated financial literacy in an individual markedly attenuating the robust relationship between intention and behaviour.

Table 7
Moderating effect of objective financial literacy

Model 2	DV: Intention					
	Coefficient	SE	t	F	R ²	ΔR^2
Intention	0.424	0.036	11.937	71.393	0.261***	0.019***
Financial Literacy	-0.163	0.035	-4.633			
Intention× Objective Financial Literacy	-0.129	0.032	-3.983			

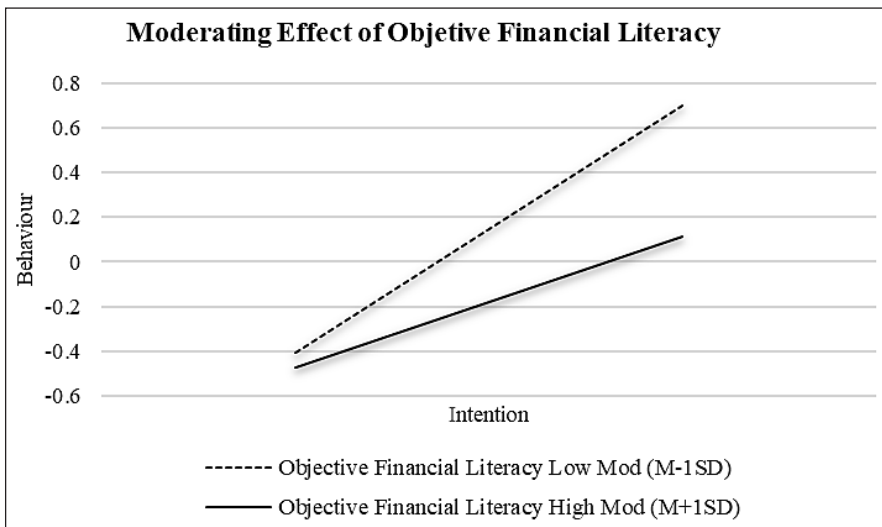


Figure 4. Simple slope plot for objective financial literacy's moderating effect

Table 8
Moderating effect of subjective financial literacy

Model 3	DV: Intention					
	Coefficient	SE	t	F	R ²	ΔR ²
Intention	0.376	0.032	11.694	133.631	0.399***	0.040***
Financial Literacy	-0.347	0.033	-10.675			
Intention × Subjective Financial Literacy	-0.187	0.029	-6.359			

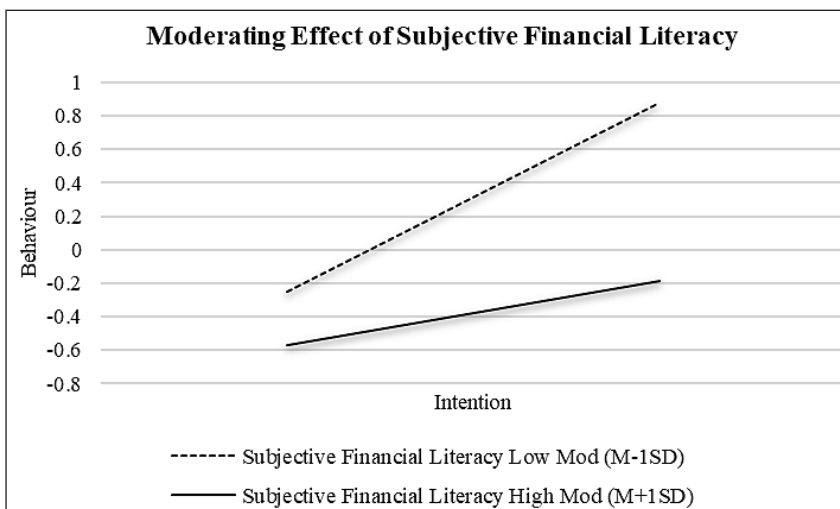


Figure 5. Simple slope plot for subjective financial literacy’s moderating effect

The findings indicate that, in alignment with previous studies employing the TPB model, attitude, subjective norms, and perceived behavioural control greatly influenced the intention of Chinese EAs to utilise OCC, which eventually had a substantial effect on their actual OCC usage behaviour. The mediating role of intention between attitude, subjective norms, and perceived behavioural control, as well as their final behaviour, remained significant but with a minimal mediation effect. The examination of the moderating effects of financial literacy indicates that both overall financial literacy and objective/subjective

financial literacy all considerably affect the relationship between intention and behaviour. Moreover, subjective confidence in financial behaviour significantly influences individual behaviour in a stronger way than objective financial literacy. The detailed discussion is as below.

The influx of OCC products into the lives of Chinese EAs inevitably captured their favour due to their convenience of application, comprehensive offerings when using, and inherent mystique as a fintech, leading to a predisposition for a favourable view of OCC. Attitudes can be instrumental or emotional (Rhodes & Courneya, 2005),

OCC enables individuals to access credit products at home, offering significant convenience to users residing in rural places lacking regular banking facilities (Hau et al., 2019), thereby meeting their instrumental needs. The authorisation procedure for OCC products is conducted by AI, alleviating individuals from the asset discrimination often seen in the banking sector, thereby enhancing the user's sense of respect and emotional satisfaction (McDonald & Dan, 2021). In this instance, it makes it difficult for EA to maintain a negative disposition towards OCC.

Simultaneously, as EA of the identity-forming age, they are particularly susceptible to the influence of their surrounding individuals, including parents, peers, and community associations, which can profoundly affect their behaviour (O'Connor et al., 2011). The promotion of OCC products by authorities to rejuvenate the consumer market (Cai et al., 2024) and the frightening penetration rate of nearly one in three individuals among EAs utilising OCC is subconsciously shaping the subjective norms of EAs regarding OCC usage, leading them to perceive the adoption of OCC products in modern society as a trendsetting and desirable pursuit (Xie et al., 2021). Regarding perceived behavioural control, individuals in the digital age have long been familiar with digital payment methods and are comfortable with the use of OCC, hence, they do not concern themselves with the capability of employing OCC (Li et al., 2019). Ultimately, this study found that intention significantly influence an individual's ultimate OCC

practice, as any behaviour must stem from the concept of undertaking an action (C. Zhang et al., 2021). Considering the context, the prevalence of OCC in Chinese EA is unsurprising.

Financial literacy strongly moderates the intention-behaviour link in OCC adoption, with subjective literacy having a greater constraining influence than objective literacy. One possible explanation is that, while objective knowledge is essential, the real-life financial literacy necessitates the confidence to properly manage financial and OCC issues (L. Liu & H. Zhang, 2021). Beneficial financial behaviours are motivated not only by objectively measurable skills, but also by self-confidence, which will together provide long-term psychological cues that reinforce responsible decision-making and, as a result, promotes financial well-being across various age groups and literacy levels (Amagir et al., 2020; Henager & Cude, 2016).

CONCLUSION

This study employed an extended TPB model to untangle Chinese EA's OCC adoption. The results show that attitude, subjective norms, and perceived behavioural control predict intention to adopt OCC among Chinese EA. Intention mediates their effects on subsequent use. Financial literacy moderates the intention-behaviour link, with higher literacy weakening the translation of intention into use; the moderating role is stronger for subjective literacy than for objective literacy. This study provides recommendations for future researchers

to examine the OCC adoption behaviours of Chinese EA and encompassing both theoretical and practical implications for policymakers.

For theoretical limitations, this study validates the TPB model but finds that the link between intention and behaviour is weaker than expected, suggesting the presence of barriers that prevent intention from translating into action. Future research should thus examine not only direct paths but also potential moderators. In addition, the study extends existing OCC research by demonstrating that financial literacy, particularly in its subjective form, has a stronger moderating effect in the intention–behaviour relationship. The results for the moderation analysis underscore the need to treat subjective and objective financial literacy as distinct focal points when doing financial literacy-related research.

Practically, these findings provide valuable guidance for financial education interventions. Although the Dunning–Kruger effect may be present among the public’s financial literacy, the findings suggest that subjective financial literacy is not only as important as objective literacy but may also exert a stronger influence on financial behaviours. This underscores the need for policy interventions that combine systematic financial education with strategies to build confidence and psychological readiness. Policymakers, therefore, need to design financial education initiatives that combine knowledge transfer with positive psychological guidance, enabling individuals to rely on financial

self-confidence to detect potential risks and make more responsible decisions even when their objective knowledge is incomplete. In addition, given that subjective financial literacy can be improved within a relatively short period, policymakers may prioritise enhancing subjective literacy among groups with lower objective literacy. Such efforts could help offset knowledge deficits and enable individuals to respond more effectively to financial challenges in the short term.

This study still has several limitations. Although financial literacy was examined as a moderator of the intention–behaviour link in OCC adoption, the relatively weak correlation suggests that other moderators may also be relevant and warrant further investigation. In addition, reliance on a Chinese sample, drawn from the world’s largest OCC market, may limit the transferability of the findings to different cultural and institutional contexts. Future research should therefore identify additional moderators that influence prudent OCC use and further examine how subjective and objective financial literacy functions across diverse settings with culturally localised instruments.

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A Scoping Review of Regulatory Framework on Parenting Education for Divorcing Parents

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ABSTRACT

Divorce is a significant life event that impacts the couple and their children. Studies show that children of divorced parents are more prone to emotional, behavioural, and academic difficulties, which are primarily linked to the stress stemming from parental separation. The regulatory framework of positive parenting education for divorcing parents has attracted significant interest among scholars worldwide, prompting the exploration of related emerging issues. With the increasing number of published studies, there is a pressing need to map and review all available literature to provide comprehensive and organised insights into the framework of parenting education. It will help build a solid foundation on the evidence-based regulatory framework that defines effective parenting education in divorce cases. A primary research question guiding this scoping review is "What are the regulatory frameworks of parenting education for divorcing parents?" Related articles and documents were retrieved from Google Scholar, EBSCOhost, Wiley, Scopus, and PsycINFO. The thematic analysis has been classified into six (6) key themes emerging from this analysis: (1) mandatory or voluntary participation, (2) settings, (3) programme acceptability and compliance, (4) programme effectiveness, (5) programme variations, and (6) challenges and limitations. While

there are differences in how the programmes are implemented, the results indicate that all of them are beneficial in lowering interparental conflict, improving co-parenting techniques, and promoting children's well-being, which calls for more research and can also be used to inform related programme design and policymaking in other countries.

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INTRODUCTION

Divorce is a significant life event that affects not only the couple involved but also their children. Research indicates that children of divorce are more likely to experience emotional, behavioural, and academic problems, often attributed to the stress associated with parental separation (Amato, 2010). In response to these concerns, parenting education programmes have emerged as a critical intervention to mitigate the adverse effects of divorce on children. It can be defined as tools provided or alternatives by family courts to support fragile families in the face of changes in family structure, such as divorce, custody challenges, foster placement, adoption, or co-parenting by non-spouses (Powell et al., 2020). Parenting education during divorce has a developmental history dating back to the end of the 1970s and expanded at a high pace during the 1990s (Salem et al., 2013). The latest survey reported on the implementation of parenting education programmes in the United States shows that it has been widely used; as many as 46 states have mandated parenting education provided by the family court (Mayhew, 2016; Mulroy et al., 2013; Pollet & Lombreglia, 2008). There are various parenting education programmes, but mostly their goals are the same: to give tips to parents to deal with conflict, to improve communication, to establish well-being for their children both before and after divorce. Notwithstanding these attempts, the effectiveness and extent of programmes are dependent on the legal parameters that guide their implementation.

The legal framework for parenting education varies in its implementation across different jurisdictions, cultures, as well as laws and policies aimed at addressing the challenges of divorce and co-parenting. In Australia, Family Relationships Centres were introduced in 2006 to improve family relationships, maintain family unity, and support families during the separation process (Parkinson, 2013). In the meantime, in Denmark, a new law was passed in 2019 that obliges all divorcing parents to follow a 17-module online Cooperation After Divorce (CAD) course (Ciprić et al., 2020). Additionally, since July 2024, Singapore has required parents whose children are below the age of 21 to first attend a mandated parenting course before entering divorce proceedings (Singapore Ministry of Social and Family Development). The initiative will assist the parents to ensure that they take the well-being of their children seriously and ensure that they embrace cooperative parenting even in circumstances of separation, but with respect for the parental autonomy.

As far as parenting education is concerned, it can be guided by three significant theories: Bowlby's Attachment Theory (1982), Bandura's Social Learning Theory (1977), and Family System Theory (Bowen, 1978). According to Attachment Theory, secure and consistent interactions between parents and children are of utmost importance, especially in the context of family separation or changes in family structure. On the other hand, Social Learning Theory emphasises the importance of

parents as role models in shaping children's behaviour, implicitly suggesting that practical co-parenting skills can provide children with constructive examples of conflict resolution and communication (Bandura, 1977). Complementing these, Family Systems Theory (Bowen, 1978) provides an understanding of the family system as interconnected units in which the actions of one family member can influence and be influenced by other family members. This theory explains that when parents' divorce acrimoniously, children will experience stress due to the instability in the family system. Thus, such programmes can serve as an intervention to promote healthy family functioning. This study also considers the Islamic perspective through the lens of *Maqasid al-Shariah* (the objectives of Islamic Law), which has five basic objectives for the well-being of individuals and society (Al-Ghazali, 1997). One of them is protecting the lineage (*hifz al-nasl*), which emphasises the importance of maintaining family relationships and the well-being of children by encouraging responsible co-parenting and the emotional well-being of children even after divorce. Together, the combination of psychological theories and Islamic perspectives provides a holistic foundation and a comprehensive understanding of parenting education that encompasses emotional, behavioural, and moral-spiritual dimensions.

The latest data on divorce and marriage of Muslims and non-Muslim in Malaysia recorded a decline, with 8.7 per cent from 63,338 cases in 2022 to 57,835 cases in 2023 (Department of Statistics Malaysia,

2024). However, the divorce rate among Muslims remained high, representing more than three-quarters of the total cases. Despite theoretical support and research evidence from the existing literature that mostly comes from the United States, the possibility of Malaysia implementing a similar regulatory framework has yet to be explored. By reviewing and mapping the evidence-based findings, this study will provide a comprehensive understanding of the current regulatory landscape and identify areas for future research and policy development in Malaysia. A scoping review was chosen for this study as it helps the researchers to examine evidence that is still emerging. It could provide reporting on the type of evidential information that can be used to guide practice in the field and the mode in which research has been carried out (Armstrong et al., 2011). What sets scoping reviews apart from other reviews, such as systematic reviews, is that a more exploratory approach is employed. According to Munn et al. (2018), a scoping review also ensures that a more descriptive review of the existing studies can be conducted without requiring a more critical appraisal of individual studies or evidence synthesis of various studies.

MATERIALS AND METHODS

Formulation of the Research Question

This scoping review was to map the evidence on areas that should be considered when designing parenting programmes among divorced parents. With the aid of using the participant, concept, and context (PCC)

framework, the scoping review included studies, which: (a) involved divorcing parents, whose children are still minors, (b) targeted the concept of parenting education, and (c) were conducted in the context of a regulatory framework. The scoping review developed a research question for the study, which is: What is the regulatory framework of parenting education for divorcing parents?

Systematic Searching Strategies

The systematic search strategy used in this study had three steps, namely, identification, screening, and qualification. All these

phases were implemented in the study to ensure that it was conducted in a thorough and transparent manner (Figure 1).

Identification

This initial stage plays a key role in expanding keywords in the database during the search process (Durach et al., 2017). The keywords included in the search were “regulatory framework”, “divorce education”, “parenting education”, “divorcing parents”, and other related terms such as “law”, “regulation”, and “co-parenting education”. The search was refined with the help of Boolean operators

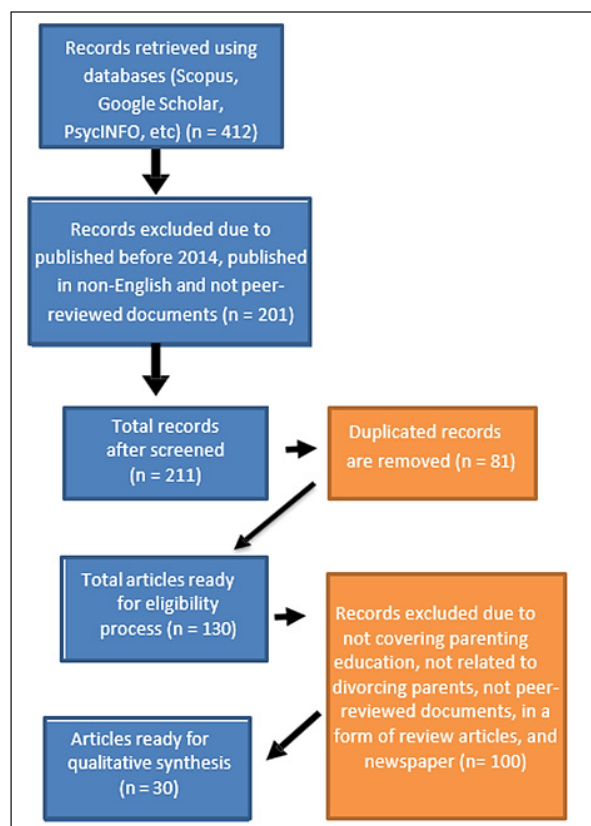


Figure 1. Systematic searching strategies of the scoping review

(OR, AND) and phrasal-level searches. Five databases were used to retrieve the articles, including Google Scholar, EBSCOhost, Wiley, Scopus, and PsycINFO. The search was completed throughout June and October 2024, with 30 possible articles being obtained as a result (all duplicate sources were removed).

Screening

Screening was the second process of the systematic search strategies, distinguishing suitable articles from unsuitable ones for the review. The inclusion and exclusion criteria for the articles included are outlined in Table 1. As divorce is a multi-dimensional issue that crosses several domains - legal, social, economic, and psychological - articles were selected amongst those published from 2014 to 2024; one article from 2008 was included due to its significant contribution to the understanding of historical development of parenting education programmes in the U.S.; and only peer-reviewed articles were selected to ensure the quality of the articles. Other important criteria were that only

articles published in one language (English), are included to avoid confusion, minimise costs, and save time (Linares-Espinos et al., 2018).

Eligibility

The third process refers to eligibility; 130 selected articles were reviewed and filtered to ensure they fit the selection criteria. Firstly, all abstracts were read to determine the suitability of the articles. The full articles were then examined to determine their suitability for the research title. As a result, 100 articles were excluded because they did not discuss the topic of parenting education among divorcing parents, were not peer-reviewed articles, and in the form of review papers or newsletters. Therefore, 30 articles were finally selected for the scoping review.

Data Extraction and Analysis

The research question guided the data extraction process. All data extracted from the selected studies were related to the regulatory framework of parenting education for divorcing couples. This study

Table 1

Inclusion and exclusion criteria of the included articles in the analysis

Criterion	Inclusion	Exclusion
Databases	Wiley, PsycINFO, EBSCOhost, Scopus, Google Scholar	All other databases
Time frame	2014 – 2024. One from 2008.	
Focus	Studies focused on the regulatory frameworks of parenting education for divorcing parents.	Studies that did not address the regulatory framework of parenting education for divorcing parents.
Language	English	Other than English
Target population	Divorcing parents	Other types of parents

used thematic analysis to identify themes based on patterns obtained from the selected articles, then similarities and correlations between the abstracted data (Braun & Clarke, 2006). Similar or related data were grouped in the initial stage according to specific themes. The researchers identified six main themes. The themes were reviewed and re-filtered in the next stage to ensure their usefulness and accurate data representation. During this process, all themes were selected because of their relevance to the research questions, namely (1) mandatory or voluntary participation, (2) programme settings, (3) programme acceptability and compliance, (4) programme effectiveness, (5) programme variations, and (6) challenges and limitations.

RESULTS

The reviewed studies emphasise the critical role of parenting education programmes, particularly in the context of divorce. They highlight their effectiveness in reducing interparental conflict, enhancing co-parenting practices, and supporting the well-being of children. Mandatory and voluntary programmes demonstrate varying degrees of success, but several consistent main categories have emerged. Before tapping into the main categories, this study investigated the characteristics of the selected studies.

Characteristics of the Selected Studies

This study involved 30 articles. As expected, most of the studies were conducted in the U.S. (23 studies), as the U.S. has

experienced historically high divorce rates, particularly in the late 20th century. Spain follows this (4 studies), Ireland (1 study), Hong Kong (1 study), and Norway (1 study) as illustrated in Figure 2. Most selected studies were published as journal articles in 2021 (6 studies), as shown in Figure 3.

The Emerging Themes

Mandatory or Voluntary Participation

This scoping review examined participation models and identified three distinct implementation approaches: mandatory, voluntary, and hybrid. Mandatory approaches were discussed in twelve studies (Becher et al., 2018; Ferraro et al., 2016, 2018, 2020; Jewell et al., 2017; Lau, 2021; Monk, 2024; O'Hara et al., 2021, 2024; Turner et al., 2021; Yamaguchi & Randel, 2021; Powell et al., 2020). These approaches represent the most structured model, requiring participation through court orders or state legislation (e.g., A.R.S. §25-351, 2024; Ferraro et al., 2016). Their target audience is typically divorcing or separated parents with young children (Monk, 2024; Jewell et al., 2017). Examples of the programmes include Arizona's Pima County Parent Education Program (PC-PEP; O'Hara et al., 2024).

Besides mandatory programmes, the voluntary methods of parenting education have been described in six other studies (Choi et al., 2017; Martínez-Pampliega et al., 2015, 2021; Merino et al., 2017; Novo et al., 2019; Sandler et al., 2017). This choice will enable parents to choose and participate on their free will and

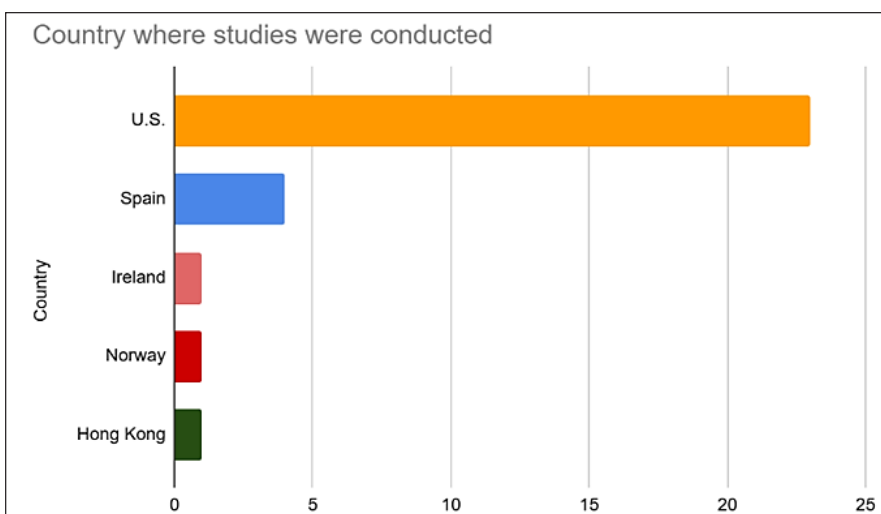


Figure 2. Countries where studies were conducted

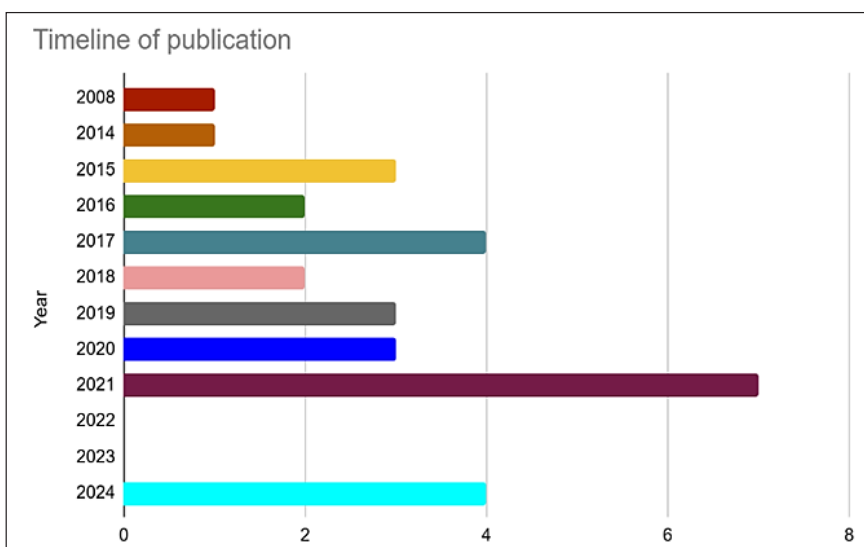


Figure 3. Timeline of publication

preferences, particularly when they are at a vulnerable stage (Martínez-Pampliega et al., 2021; Novo et al., 2019). For example, the Egokitzen and Parental Separation Program focuses on self-directed involvement

without any coerciveness in co-parenting services and honouring their availability. The voluntary nature of participation is also upheld in several court-referred initiatives, such as the New-Beginnings-Dads Program

(Sandler et al., 2017), which serves as an element of alignment as jurisdictions integrate systemic advice and personal autonomy (Pruett & Cornett, 2017).

There are seven studies that commented on the co-parenting education programmes hybrid-form (Cox et al., 2021; deLusé & Braver, 2015; OHara et al, 2021; Pollet & Lombreglia, 2008; Mayhew, 2016; Saini & Corrente, 2024; Schramm & Becher, 2020). The degree of hybridity involves a liberated structure to participation, as well as offering parents options (Saini & Corrente, 2024; O'Hara et al., 2021). According to a recent study, the New Beginnings Program (NBP) offers both court-ordered services to high-conflict families and voluntary ones through the same medium (O'Hara et al., 2024). Moreover, Georgia as well as Texas also have hybrid systems that are subject to the decision of the judicial department that may enable the determination of participation requirements on a case-by-case basis (Ferraro et al., 2016). Additionally, some hybrid programmes will require a domestic violence opt-out clause (Choi et al., 2019), acknowledging that not all family situations will need or benefit from mandatory requirements.

Programme Settings

A second theme that emerged from this scoping review was the delivery setting of the co-parenting education programmes. It is also indicated in the analyses that these parenting programmes were presented in different arrangements that included traditional face-to-face, online-based and presented in various institutions, including

court-based, community-based, and university-based. A particular discussion was about the two main delivery models: online or traditional face-to-face (Becher et al., 2018; Bowers et al., 2014; Mayhew, 2016; Monk, 2024; O'Hara et al., 2024; Powell et al., 2020; Schramm & Becher, 2020). On top of this, five studies emphasised self-paced learning through online platforms (Ferraro et al., 2020, 2018, 2016; Turner et al., 2021; Yamaguchi & Randel, 2021).

Ten studies on parenting education programmes reported to deliver on a traditional face-to-face basis and occurred mostly in court-mandated and community-ordered cases (Bertelsen, 2021; Cox et al., 2021; Jewell et al., 2017; Keating et al., 2015; Lau, 2021; Martínez-Pampliega et al., 2015; Merino et al., 2017; O'Hara et al., 2024). Such programs are operated through a court order and within the court setting. As an example, the Pima County Parent Education Program (PC-PEP) has been implemented in person at courthouses (O' Hara et al., 2024) and in community-based settings (e.g., Children First Initiative) (Jewell et al., 2017). In addition, seven studies document university-based implementation, primarily for research and development-oriented programmes (Ferraro et al., 2020, 2018, 2016; Martínez-Pampliega et al., 2015, 2021; Merino et al., 2017; Pruett & Cornett, 2017).

Programme's Acceptability and Compliance

The third theme discusses how participants accept the programme and their compliance.

The majority of studies reported high levels of participant acceptance, satisfaction, and compliance across a variety of programme structures (Bowers et al., 2014; Cox et al., 2021; Ferraro et al., 2018; Keating et al., 2015; Martínez-Pampliega et al., 2015; Mayhew, 2016; Monk, 2024; O'Hara et al., 2024, 2021; Pollet & Lombreglia, 2008; Pruett & Cornett, 2017; Randel, 2021; Saini & Corrente, 2024; Shapiro et al., 2024; Turner et al., 2021; Yamaguchi & Schramm & Becher, 2020). Online programmes demonstrated particularly strong acceptability, with participants citing convenience as a key advantage in programmes like Successful Co-parenting After Divorce (Ferraro et al., 2016; O'Hara et al., 2024). However, some studies noted opportunities for improvement, with participants suggesting enhanced interactive elements in digital formats (Bowers et al., 2014).

Compliance rates vary significantly across programmes. Court-mandated programmes such as the Pima County Parent Education Program (PC-PEP) and the Children First Program have documented high and consistent participation rates due to their mandatory delivery methods (Jewell et al., 2017; O'Hara et al., 2024). In contrast, voluntary programmes face challenges in engagement and lack of cooperation, as evidenced by the New Beginnings Program (NBP), which reports only 7-8% enrolment (O'Hara et al., 2021), and Egokitzen is also experiencing significant attrition (Merino et al., 2017). Although most studies reported high participant acceptance and compliance,

five studies also documented incidents of non-compliance and dissatisfaction (Bertelsen, 2021; Mayhew, 2016; O'Hara et al., 2021; Schramm & Becher, 2020; Shapiro et al., 2024). According to Mayhew (2016), some parents could not see the programme's importance and benefits and considered it burdensome. Schramm and Becher (2020) reported resistance among participants who saw the program content as irrelevant or time-consuming.

Programme Effectiveness

The effectiveness of this programme across various domains of family functioning was also studied. Eleven literature reviews showed consistent evidence for the efficacy of divorce education programmes in improving family outcomes with significant reductions in destructive interparental conflict and measurable improvements in parenting quality (Becher et al., 2018; Bertelsen, 2021; Choi et al., 2019; Cox et al., 2021; Keating et al., 2015; Lau, 2021; Martínez-Pampliega et al., 2021, 2015; Merino et al., 2017; O'Hara et al., 2024, 2021). Four research centred on parent-focused outcomes reported that participants gained significant benefits in parenting knowledge and co-parenting skills across a range of interventions (Saini & Corrente, 2024; Turner et al., 2021; Yamaguchi & Randel, 2021; Jewell et al., 2017).

Additionally, eight studies included mental health benefits as secondary outcomes for both parents and children (Martínez-Pampliega et al., 2021, 2015; Novo et al., 2019; Merino et al., 2017; O'Hara et al.,

2024, 2021; Sandler et al., 2017). While many studies have demonstrated program effectiveness, nine studies have reported inconsistent and variable effectiveness, with some showing significant benefits while others have found limited or negligible effects (Becher et al., 2018; Bowers et al., 2014; deLusé & Braver, 2015; Ferraro et al., 2020, 2018, 2016; Lau, 2021; O'Hara et al., 2021; Pruett & Cornett, 2017). For example, Family Transition Guides (FTG) have shown a significant positive effect on reducing legal conflict but have only minimal impact on children's fragile psychosocial outcomes during this phase (O'Hara et al., 2021).

Programme Variations

A comprehensive analysis of 30 studies revealed a fifth theme: programme variation. Ten studies specifically documented variation in programme duration, ranging from brief 1-hour interventions to more extensive, intensive, and comprehensive 10-hour programmes with different modules (Becher et al., 2018; Bertelsen, 2021; Bowers et al., 2014; Keating et al., 2015; Lau, 2021; Martínez-Pampliega et al., 2015, 2021; O'Hara et al., 2024; Powell et al., 2020; Schramm & Becher, 2020). Most programmes establish a standard 4-hour program format, such as the Pima County Parent Education Program (PC-PEP) and the Parents Forever Program. This format has been subject to practical considerations and court-mandated requirements, making the 4-hour programme format the standard across jurisdictions.

In terms of programme content, there is a lot of variety and interest depending on the length and needs of the programme. Based on this analysis, the average programme used content focused on child-centred and adult-centred situations. The Focus on Kids (FOK) and the Successful Co-parenting After Divorce content focused on child-centred workshops, had activities such as group sessions for children (typically ages 6–15), and understood divorce from a child's perspective. For adult-centred, on the other hand, it was about the effects of divorce, co-parenting communication strategies, legal guidance, and managing conflict. There are also content programmes tailored to special circumstances, such as domestic violence, substance abuse, and mental health for families in need.

Almost all programmes have their own creativity to encourage participation. They incorporate interactive elements, such as workshops, lectures, role-plays, self-guided workbooks, and real-life scenario discussions, including the use of multimedia components such as PowerPoint slides, videos, and quizzes as noted in eight studies (Cox et al., 2021; Ferraro et al., 2020; Keating et al., 2015; Lau, 2021; Monk, 2024; O'Hara et al., 2024; Turner et al., 2021; Yamaguchi & Randel, 2021). In addition, program accessibility is also enhanced through multilingual options to ensure that participants from diverse linguistic backgrounds can benefit from the program, such as the Online Parenting Program, which is offered in two languages, English and Spanish (Bowers et al., 2014),

but not all programmes offer this option. Regarding time, there are programmes with flexible scheduling, including weekend or weekday sessions, allowing participants to adapt to their schedules, such as the Parents Forever Program (Becher et al., 2018).

Challenges and Limitations

Every parenting programme is faced with impediments, such as the implementation, participant-related, and content-related limitations. Regarding the implementation issues, six research studies indicated that participants complained about the program being too brief and as such, it had failed to capture all the significant contents (Becher, 2020; Becher et al., 2018; Bowers et al., 2014; Pollet & Lombreglia, 2008; Schramm & Mayhew, Z. 2016; Turner et al., 2021). Moreover, nine findings described that mandatory attendance was associated with some problems whether in terms of low compliance levels, high attrition rates, as well as participants' choices to drop out without the successful completion of the programme assigned to them (Choi et al., 2019; deLusé & Braver, 2015; Keating et al., 2015; Lau, 2021; Martínez-Pampliega et al., 2021, 2015; O'Hara et al., 2024, 2021; Pruitt & Cornett, 2017).

Moreover, the online programmes that offer flexibility encounter problems, including technology impasses and technical failures on the part of the participants who may be weak in digital literacy (Ferraro et al., 2018; O'Hara et al., 2024). There are still numerous socioeconomic and logistical barriers to participation (Shapiro et al., 2024). Lastly, participation is not easy due

to content restrictions, especially when addressing behavioural change. Few studies highlighted the one-sided focus on adults, making the absence of child outcomes post-interventions (Becher et al., 2018; Choi et al., 2019; Cox et al., 2021; Jewell et al., 2017). Previous studies also reported that many programmes adopt a one-size-fits-all approach, which may overlook critical issues such as trauma-informed approaches for vulnerable participants (Bowers et al., 2014; Ferraro et al., 2020).

DISCUSSION

Child well-being, co-parenting dynamics, programme implementation, and programme effectiveness are among the most extensively studied family dynamics related to divorcing or separating families. Most of these studies have undergone significant theoretical development, evidence-based programme development, and policy integration, making them a mature study area in family studies, family psychology, education, and law. However, it is still evolving, with vast and contrasting outcomes. Parenting education for divorcing parents has historically garnered academic attention since the 1970s and continues to be actively studied today, particularly in Western countries. However, in non-Western countries, these studies are still in the initial and exploratory stage of development, which might be due to differences in the legal systems, research investment, cultural norms, and parental readiness.

Although past studies can be best described as a mature field with ongoing

innovation, the debate over whether the programme should be mandatory or voluntary remains a hot topic. Previous studies have revealed a variety of approaches across jurisdictions and different programs, with some programmes being strictly mandatory with court orders, others being voluntary based on need, and some offering a combination of both and hybrid programs. Pollet and Lombreglia (2008) are among the early studies that explored this topic, reporting that some form of mandatory parenting education programmes has already been implemented by 46 states in the US, with 27 states mandating attendance while only two states make it non-compulsory; a fact that has also been cited in several subsequent studies (Barth et al., 2019; Choi et al., 2019; Mayhew, 2016). Across all reviewed articles, the case of *Troxel v. Granville* (530 U.S. 57, 2000) was the only court case cited in general (O'Hara et al., 2024) to emphasise the constitutional balance between parental autonomy and the best interests of minors in family court decision-making. On the other hand, state statutes are often discussed and used as a reference, especially in studies that analyse legal provisions of parenting education programmes in the Western countries.

Among the most frequently cited legal provisions are the Florida Statutes (§ 61.21) which mandates parenting education and family stabilisation courses for divorcing couples; Arizona Revised Statutes (Ariz. Rev. Stat. §§ 25-351 & 25-381.01) require completion of mandatory parenting education before parties participate in

family mediation and providing ways for married couples to resolve family conflicts amicably; Iowa Code (§ 598.15) requires mandatory parenting education courses during divorce for parties in actions involving child custody or visitation; Kansas Statute (§ 23-3214) mandates parenting education to inform divorcing parents of the effects of divorce on children; Minnesota Statute (§ 518.157) mandates divorcing parents with minor children to attend the "Parents Forever" programme which is described as one of the approved options that meet the statutory requirement for parenting education (Becher et al., 2018; Ferraro et al., 2016; Mayhew, 2016; O'Hara et al., 2024; Pollet & Lombreglia, 2008).

On the other hand, other states mandate online platforms, such as Utah's online divorce education course and Florida's 4-hour Parenting Education and Family Stabilisation Course (Ferraro et al., 2016; Turner et al., 2021). While certain jurisdictions make it mandatory, some programmes offer it voluntarily, allowing parents to participate in equipping themselves with parenting knowledge based on their personal needs or interests. For instance, the Egokitzen, the New Beginnings Program (NBP), and the Parental Separation, Not Family Breakdown Program are conducted voluntarily, and non-participation will not result in legal or disciplinary action (Martínez-Pampliega et al., 2021; Novo et al., 2019; Sandler et al., 2017). Different approaches according to jurisdictions have led some to mandate specific programmes and others to offer voluntary options (Saini & Corrente, 2024).

In some other states, such as Texas (Tex. Fam. Code § 105.009) and Georgia (Ga. Unif. Super. Ct. R. 24.8), the decision to mandate participation is left to the presiding judges to decide whether parents must attend co-parenting education programmes, which makes it voluntary participation (Ferraro et al., 2016). Taken together, these statutes establish that most U.S. jurisdictions require court intervention or allow court-mandated parenting to promote shared parenting, resolve family conflicts amicably, and protect the well-being of children after divorce.

Another critical dimension that determines the effectiveness of the programmes is the programme setting. Initially, most programmes used a traditional in-person format approach, especially in courts, community centres, or university settings. However, the COVID-19 pandemic, which has limited face-to-face meetings, has led to a surge in online approaches. Typically, programmes conducted in in-person classes are closely tied to the family court system and in community settings. Examples include the Parents Forever Program (Becher et al., 2018), two levels' (Level 1: information-based talks and Level 2: participatory, interactive workshops), parenting education programmes in Hong Kong (Lau, 2021), Family Visitation Centres (FVCs) in Spain (Martínez-Pampliega et al., 2021), the Children First Program (Jewell et al., 2017), Pima County Parent Education Program (PC-PEP) (O'Hara et al., 2024), and the Family Transitions Guide (FTG) (O'Hara et al., 2021).

Since the COVID-19 pandemic, programmes such as the Pima County Parent Education Program (PC-PEP) and the eNew Beginnings Program (eNBP) have introduced an online format to ensure their accessibility and continuity (O'Hara et al., 2024). In the same way, a Focus on Kids (FOK) Program has also been converted into an online form to meet diverse demands (Monk, 2024). Besides, numerous other programmes were conducted online featuring various interactive and multimedia components to increase participants' involvement. Among such programmes are the Successful Co-parenting After Divorce Program (Ferraro et al., 2016), Online Parenting Programs (Bowers et al., 2014), and a state-mandated online divorce education course offered by the state of Utah (Turner et al., 2021).

Research has recorded the success of court-mandated interventions and well-structured programmes that suit the needs of parents, which leads to a high level of acceptability among participants. For instance, the Pima County Parent Education Program (PC-PEP) was highly acceptable to parents, with 87% reporting the modules personally relevant and 96% agreeing that it was intelligible (O'Hara et al., 2024). Participants in the Focus on Kids (FOK) Program, on the other hand, reported high levels of satisfaction (92.7%) agreeing that the content presented would influence their decision-making regarding their children and 87.2% stated that the programme was overall beneficial to them, with reward of receiving a certificate of completion upon

successful completion of the programme (Monk, 2024). Likewise, two Midwestern counties that mandated the Children First Program also recorded high attendance rates due to its nature of court-directed participation (Jewell et al., 2017). Co-parenting for Resilience (CPR) programmes that do not require a court mandate also have high acceptability rates, with 95–98% of parents reporting that the programme is worthwhile and would recommend it to others (Cox et al., 2021).

Online programmes have also been well-received due to their flexibility and convenience. For example, the Successful Co-Parenting After Divorce Program was made accessible anytime, available 24/7, designed to be highly quality, and empirically based. It has allowed participants to learn independently (Ferraro et al., 2016). Similarly, for Online Parenting Programs, participants' feedback suggests adding multimedia elements to encourage engagement (Bowers et al., 2014). Although many studies have documented high levels of acceptability and compliance among participants, voluntary programmes often face lower compliance and higher attrition rates because they rely entirely on individual personal preferences. For example, the New Beginnings Program (NBP) still has a low enrolment rate (7-8%) even though no fee is charged, demonstrating low parental motivation to participate voluntarily (O'Hara et al., 2021).

The most important dimension of this study is programme effectiveness, which has several findings related to factors such as

target audience, programme design, module content, and outcomes measured. The study revealed a variety of outcomes, including reduced parental conflict, improvements in parental knowledge and skills, and positive child outcomes. Martínez-Pampliega et al. (2021), through the Egokitzen, reported a significant reduction in parental conflict while improving their mental health state with lasting effects at six and 12-month follow-ups. Similarly, Cox et al. (2021) also documented a reduction in conflict in co-parenting through the Co-Parenting for Resilience (CPR) Program, as did the New Beginnings Program (NBP), which showed long-term benefits for high-conflict parents, as reported by O'Hara et al. (2021).

Apart from that, such programmes have also reported improvements in parental knowledge and skills related to co-parenting. Participants in the Focus on Kids (FOK) Program gave positive feedback, such as being able to control themselves from maladaptive behaviours, including arguing in front of their children, indicating the programme had increased their knowledge of co-parenting practices and strategies (Monk, 2024). Online Parenting Programs also claim that parents become more confident when communicating with their children, although communication between co-parents was observed to have less progress (Bowers et al., 2014). In this regard, positive effects on child well-being have also been reported, such as reduced mental health problems and increased social competence. According to Martínez-Pampliega et al. (2021), the Egokitzen

Program, which incorporates many elements of parental mental health, indirectly helps in reducing children's anxiety symptoms. In addition, following a 10-months of the New Beginnings-Dads Program (NBP-Dads), it was reported that children improved their social competence, enabling them to interact effectively with others.

In terms of programme variation, parent education programmes are delivered in a variety of designs and formats. It encompasses several dimensions, such as the duration of the time, with programmes ranging from a brief 1-hour online course to the longest 10-hour intervention. However, on average, most programmes are conducted in the 4- to 8-hour range, as established by the Pima County Parent Education Program (PC-PEP), which is predicted to be more beneficial for participants (O'Hara et al., 2024). They continued that delivery methods have evolved from traditional in-person to online and hybrid formats, which have been accelerated by COVID-19, making in-person meetings limited. For example, the Forever Parents Program also offers both online and in-person 4-hour and 8-hour formats that reflect the court's different needs and the family's needs (Becher et al., 2018).

As for programme content, average programmes focus on three specialised areas, such as child-centred, adult-centred, and special circumstances (domestic violence, substance abuse, and mental health). Among the programmes that emphasise child-centred elements in their content is Focus on Kids (FOK), which contains activities

to help children's express feelings about the divorce, understand that divorce is not their fault, and develop coping skills (Monk, 2024). In their review, Schramm et al. (2017) also suggested that child-centred content or co-curricular activities are key in teaching parents and helping them to increase the likelihood of children making healthy adjustments during the divorce process or changes in family structure. In addition, it draws attention to adult-centred elements such as equipping parents with skills to manage conflict, improve communication with their co-parents, and provide emotional stability for children.

In the context of pedagogical approaches, some programmes incorporate interactive elements in the modules, such as workshops, role-plays, customised parenting plans, parenting booklets, and discussions of real-life scenarios to ensure active participation. For example, the Child-Focused Program utilises multimedia elements such as video vignettes, as its primary educational delivery method (Monk, 2024), and group therapy sessions are also available for all family members (Bertelsen, 2021). Besides, the Hong Kong programmes, Level 1 and Level 2, also applied information-based lectures and participatory workshops, resulting in a more effective reduction of children's involvement in parental conflicts (Lau, 2021).

Despite many documented effectiveness, challenges and obstacles in terms of implementation also exist. For instance, some feedback reported that the programme duration was too

short to cover all important content, significantly impacting the programme's delivery and effectiveness. Additionally, through the Parents Forever Program, Becher et al. (2018) have reported that an 8-hour programme may not equip parents thoroughly with meaningful co-parenting knowledge, suggesting that at least 12 hours are needed to ensure benefits in co-parenting dynamics. Similar conclusions were drawn by Turner et al. (2021) and Bowers et al. (2014), who reported that programmes with short interventions are usually insufficient for meaningful behaviour change.

Besides, mandatory or mandated programme participation also results in low parental motivation and engagement (Shapiro et al., 2024; O'Hara et al., 2021), while voluntary programmes face constraints in terms of recruitment, retention, and attrition issues (O'Hara et al., 2021). Previous studies reported that, despite being ordered by the court to follow the programme, only about two-thirds of parents in the treatment group complied. This matter indirectly raises questions about enforcement and the effectiveness of such orders. Additionally, there were 50 dropouts (31% of the treatment group, 34% of the control group), and the reasons for dropout were not documented (Parents Plus – Parenting When Separated; Keating et al., 2015). Along with this, the complex circumstances of participants, such as domestic violence survivors, parents with a history of trauma, and high-conflict families, also contribute to the challenge as they

exceed the capacity of standard programmes (Ferraro et al., 2020; Pollet & Lombreglia, 2008).

Finally, programme content limitations also reflect the wide participation gap, resulting in difficulties in participation. One of them is that many interventions miss the most essential part, which is the children's perspective on divorce, even though they are the most affected group. Other than this, past research indicated that numerous programmes take a one-size-fits-all strategy, which could disregard serious concerns such as mental health, domestic violence, and legal advice, particularly among parents who have experienced trauma (Ferraro et al., 2020; Bowers et al., 2014).

CONCLUSION

This scoping review comprehensively overviews the current practice and provides a firm ground to develop a regulatory framework of parenting education for divorcing parents. The results are needed to empower parents and children who undergo changes in family structure due to divorce and to minimise the negative impacts of divorce on both parents and children. The absence of parenting education affects the couple as well as worsens the condition of children, who are also in a vulnerable position. Based on the findings of past studies and the increasing divorce statistics in Malaysia, it is timely to develop a regulatory parenting education framework for divorcing parents to support co-parenting practices and child adjustment following parents' divorce. Such a regulatory framework should align

with the country's legal, cultural, and social fabric of Malaysia.

Moving forward, stakeholders such as policymakers and programme developers must refine how best to adapt parenting education programmes nationally. Among the issues that need to be considered is whether the approach should be mandatory, voluntary, or a combination of both, depending on the needs of diverse families. Collaboration between education, research, law, and social service agencies should also be established to develop the best and most effective parenting education modules or settings for family institutions. While stakeholders are responsible for creating the framework, the public also needs to play a role by spreading awareness of the importance of programmes that support families in transition (divorce) and promoting healthy family communication to encourage healthy parenting practices. These efforts can encourage parents to participate in such intervention programmes to enhance their parenting competencies and contribute to the overall framework's success in guaranteeing the family's well-being during or after divorce.

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Developing a Model of Readiness for Halal Compliance in Small and Micro Food Industries: A Factor Analysis Study

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ABSTRACT

The increasing demand for Halal-certified products highlights the need for robust organisational readiness among small and micro food enterprises (SMiEs). This study aims to develop and validate a model of Halal compliance readiness using exploratory factor analysis (EFA). Drawing from the readiness organisational for change (ROC) and Readiness of Organisation for Halal Standard Compliance (ROHSC) frameworks, a pretested and piloted questionnaire was distributed to 112 SMiEs. EFA revealed four reliable constructs: motivation for change, informational assessment, perceived compatibility, and efficient communication channels, with Cronbach's alpha values ranging from 0.831 to 0.943. The ROHSC demonstrated good internal consistency (Cronbach's alpha = 0.988) across 34 item forms grouped into seven separate factors. These results indicate that the developed instrument is reliable and can serve as a practical tool for assessing SMiEs' readiness to comply with Halal standards. Practically, this toolkit may assist Halal certification bodies and training providers in identifying readiness levels and providing targeted support. The cross-validation study

indicated an acceptable model fit and supported the applicability of the model in other contexts. Further research using confirmatory factor analysis (CFA) is recommended to strengthen its generalisability and reliability across settings.

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INTRODUCTION

With the increasing number of worldwide Muslim populations and more concern about Halal products, small and micro enterprises (SMiEs) in Malaysia should seize the opportunity of the growing market. Through placing themselves in the Halal-certified sector, these enterprises can capitalise on and stand to gain to a substantial extent from the booming demand (Hafidz et al., 2023; Nanda & Ikawati, 2020). Despite the benefits of Halal certification, many SMiEs find it challenging to pursue it. The challenges are typically due to complicated application processes as well as stringent regulatory guidelines imposed by the Halal certification bodies (Andespa et al., 2024; Prawiro & Fathudin, 2023; Saiman & Yusma, 2022; Zakaria et al., 2022). The ability of SMiEs to comply with Halal standards is influenced by several factors such as the ability to access adequate resources, availability of adequate infrastructure and a clear understanding of the Halal certification process (Priantina et al., 2023; Riswantini et al., 2023; Sakti & Ramadhani, 2023). In addition, addressing these challenges requires targeted government interventions, particularly through training programmes designed to help SMiEs understand the Halal certification process, enhance their readiness, and effectively manage Halal requirements (Ahmad Nizar et al., 2022; Rafiki, 2020; Tati et al., 2024). In this study, particular attention is given to the factors that enable or hinder Halal certification readiness in small and micro-sized food enterprises.

This study makes use of exploratory factor analysis (EFA) to explore what drives readiness among SMiEs in complying with Halal certification standards. EFA is particularly helpful in breaking down complex information and revealing hidden patterns that shape organisational behaviour (Hair et al., 2021; Jo et al., 2023; Storkholm et al., 2018). Understanding these patterns enables stakeholders to design more focussed and supportive strategies that align with the real challenges faced by SMiEs (Sulfati, 2024). Therefore, EFA is appropriate in this context, as it helps uncover the underlying patterns of readiness behaviour and reveals how different factors are connected.

LITERATURE REVIEW

Organisational readiness for change (ORC), as defined by Weiner (2020), is the collective mindset and willingness of organisational members to implement change. It is determined by the perceived value of the change (motivation) and the assessment of implementation capability, which includes task knowledge, resource availability, and situational factors (Weiner, 2020). In essence, when members view the change as necessary and believe their organisation has sufficient resources, knowledge, and supportive conditions, readiness for change increases (Jamai et al., 2022; Wannasupchue et al., 2019). This theoretical framing is particularly relevant to the context of Halal certification, where readiness reflects both cognitive and structural readiness to adopt new standards that reshape operational practices and organisational culture.

The ORC theory provides a valuable foundation for understanding how SMiEs in Malaysia are ready to comply with Halal certification. According to Weiner (2020), this collective mindset is shaped by two interrelated components: change commitment, which represents members' willingness to pursue change, and change efficacy, which reflects their perceived capability to execute it successfully. Readiness in this context extends beyond structural and procedural arrangements to encompass psychological preparedness, reflecting the shared beliefs, confidence, and determination among organisational members to implement change effectively. In the case of Halal compliance, such readiness embodies the establishment of formal systems and documentation and the collective conviction that the organisation is capable and committed to upholding Halal principles in every operational aspect. Specifically, motivation for change mirrors the organisation's commitment to Halal compliance by emphasising the perceived value and importance of implementing Halal standards (Shea et al., 2014). Informational assessment and efficient communication reflect change efficacy: informational assessment captures members' perceived knowledge and resources required to implement the change (Hannon et al., 2017). Meanwhile, efficient communication, as interpreted here according to Rogers' diffusion framework, encompasses formal and informal channels, both internal and external (e.g., online portals, social media, exhibitions, and training programmes). This

can be achieved through which information about Halal compliance is transmitted and accessed to enable the organisation to perform required tasks effectively. In addition, perceived compatibility bridges both commitment and efficacy, signifying how well Halal principles are aligned with existing organisational practices and values. When compatibility is high, members perceive less disruption and greater feasibility, thereby strengthening overall readiness (Rogers, 2014). As highlighted by recent studies (Jo *et al.*, 2023; Weiner, 2020), ORC explains whether change occurs and how organisations mobilise their members, resources, and structures to support sustainable transformation. The theory aligns well with the Halal certification process, which demands both behavioural and procedural changes within firms, ranging from documentation and supply chain management to product handling and staff training (Ariefiara et al., 2022; Ruhaya et al., 2024).

Building upon this theoretical understanding, the readiness of SMiEs must also be viewed in the broader context of the global Halal economy, where increasing market demand amplifies the need for compliance readiness. One crucial determinant of successful Halal compliance is the organisation's capacity to adapt to new operational and behavioural standards aligned with Halal principles. This adaptation reflects technical adjustments and the cultivation of an internal culture that upholds Halal values across all levels of operation (Jamai et al., 2022; Md

Nawi et al., 2023; Wahyuni et al., 2024; Wannasupchue et al., 2019). With the global Halal economy projected to reach over USD 7 trillion by 2030 (American Halal Foundation, 2025) and the Halal food sector alone valued at USD 1.43 trillion in 2023 and projected to rise to USD 1.94 trillion by 2028 (DinarStandard, 2024), businesses are increasingly expected to adopt a holistic and sustained commitment to Halal standards (Abd Rahman et al., 2017; Ahmad Nizar et al., 2022; Johari & Khairunnisa, 2019; Rahim et al., 2021). Therefore, readiness for Halal compliance serves as a strategic enabler that aligns religious obligations with global trade competitiveness. However, for SMiEs, fulfilling Halal requirements remains a major challenge due to financial limitations, knowledge gaps, and infrastructural constraints (Ahmad Nizar et al., 2022; Ruhaya et al., 2024). These barriers often result in inconsistent compliance, low certification rates, and difficulties sustaining post-certification practices.

Halal readiness involves more than simply acquiring certification. It reflects a broader organisational commitment to Halal principles (e.g., ensuring supply chain integrity, training employees, staff competency, and continuous system improvement). To stay competitive and maintain consumer trust, businesses must ensure that their operations are fully aligned with Halal standards (Ariefiara et al., 2022). Studies reveal that readiness depends on awareness, commitment, operational restructuring, and adequate resources

(Abd Rahman et al., 2017; Masudin et al., 2020; Pratikto et al., 2023; Rahem et al., 2021). Companies that demonstrate a strong and consistent commitment to Halal principles are more likely to gain consumer trust and succeed in markets where Halal certification significantly influences purchasing behaviour (Ariefiara et al., 2022; Priantina et al., 2023).

Hence, examining the readiness of SMiEs through the lens of ORC offers both theoretical and practical value. It helps identify psychological and structural enablers that shape Halal adoption, allowing policymakers and industry agencies to design interventions that strengthen internal capacity. Additionally, understanding what drives readiness also facilitates tailored support that reflects the actual challenges and dynamics of SMiEs, ensuring greater inclusivity and sustainability within the Halal ecosystem.

Exploratory Factor Analysis (EFA) has been widely applied in studies exploring organisational compliance and readiness (Abd Rahman et al., 2017; Azmi et al., 2019; Jaswir et al., 2023; Jo et al., 2023; Razalli, 2018). Nevertheless, due to the unique operational dynamics and resource limitations of SMiEs, the determinants of their readiness for Halal compliance may differ from those in larger firms or across regions. In this context, EFA is used to uncover context-specific readiness components as a basis to develop focussed strategies towards enhancing Halal standard compliance in the SMiEs sector.

METHODOLOGY

A quantitative survey tool is employed to learn from 112 small and micro food businesses that joined five government-initiated Halal training courses. The results highlight problem areas where these businesses most require assistance, providing practical help for better-targeted compliance activity. To develop the survey, we conceptualised and operationalised the antecedents of both Readiness for Organisational Change (ROC) and Readiness for Organisational Halal Standard Compliance (ROHSC) through theoretical foundations and the Nominal Group Technique (NGT) process.

The ROC construct in this investigation comprises four primary measures: motivation for change, informational assessment, perceived compatibility, and effective communication channels. These constructs were derived based on ORC theory and the Diffusion of Innovation (DOI) theory. To make the research practical, an initial discussion with the first focus group was conducted in collaboration with the Halal Development Division of the Ministry of Entrepreneurship and Cooperatives Development. Early engagement with stakeholders allowed the identification of specific compliance challenges commonly faced by SMiEs. This process ensured that the framework was grounded in their actual needs and could be applied effectively in practice.

The dependent variable, ROHSC, was measured using a questionnaire developed through the NGT (Alkharib et al., 2024). The panel consisted of seven senior

auditors from the Department of Islamic Development Malaysia (JAKIM), each with more than six years of experience in Halal auditing. These experts were nominated by JAKIM based on their direct involvement in Halal certification work. Their practical experience helped ensure that the instrument captured the most common non-conformance reports noted among small and micro enterprises. The questionnaire was also aligned with the Manual Procedure for Malaysia Halal Certification (Domestic), 2020 (Department of Islamic Development Malaysia [JAKIM], 2020). Using the NGT approach strengthened the content validity of the instrument by combining field knowledge with structured group consensus.

Pretest

Pretesting plays a vital role in survey design, as it helps ensure data quality by identifying potential issues with question clarity and interpretation. This step becomes even more important in cross-cultural research, where discrepancies between languages and references can influence the validity and reliability of questionnaire translations (Aizpurua, 2020; Awang et al., 2023; Muda et al., 2020). The survey was pretested for one month with both academic experts and eligible respondents, following the approach recommended by Ruel et al. (2015) and Presser et al. (2004). The experts involved came from diverse backgrounds, including industrial psychology, Halal management, business, and research design. Their feedback was crucial in confirming that each survey item

was relevant, clearly worded, and accurately reflected the intended constructs. This stage aimed to ensure that the instrument was thoroughly refined and capable of measuring key variables effectively. It also helped minimise potential bias and reduce respondent suspicion before data collection (Boateng et al., 2018; Sekaran, 2019). Behind its use, the process was intended to uncover and correct any weaknesses in the instrument and to eliminate potential misunderstandings before the questionnaire was administered to the sampled respondents (Boateng et al., 2018; Sekaran, 2019).

In order to improve the quality of the pretest, we subsequently conducted a pilot run with five SMiEs entrepreneurs and ten diploma students from the Halal Management School at Darul Quran. This stage assessed the clarity, feasibility, and validity of the survey through individual evaluations and cognitive interviews (Aizpurua, 2020; Muda et al., 2020; Sahid, 2022; Sehwat et al., 2021). Furthermore, this procedure served to confirm the relevance of the instrument and to facilitate adaptation to the target respondents among SMiEs and food industries. The instrument was then examined, revised, refined, and polished in light of the feedback gathered. After receiving input from academic reviewers and selected respondents, 40% of the questions were modified to resolve problems of repetition, ambiguity, or lack of alignment with the research objectives. Two rounds of pretesting resulted in 77 items for the ROC and ROHSC constructs being refined and finalised for the pilot study.

Pilot Study

The pilot study is a crucial stage for assessing the clarity, reliability, and practicality of the refined instrument. Measurement: The data collected at this point are necessary to the EFA process, which is used to refine the questionnaire items, identify underlying data distributions and enhance overall scale validity (Hair et al., 2019). The pilot also includes results from an updated literature search and field testing on findings, ensuring that the items are underpinned by rigorous research and are appropriate for the population under study (Haw et al., 2022).

The pilot testing was carried out on entrepreneurs who have attended Halal training from five locations in Malaysia, namely Klang Valley, East, and South. The survey information was collected through a decentralised questionnaire, which was administered online and offline between August 21 and October 1, 2024, to gather the necessary data. To preserve a stable solution and ensure the stability in the result, a minimum of 100 respondents is required to yield reliable results in the EFA (Baistaman et al., 2020; Hair et al., 2010; Lorenzo-Seva & Ferrando, 2024; Rahlin et al., 2022). Of the 142 received questionnaires, 30 outliers were identified, leaving only 112 results to be analysed in EFA. Responses are rated on a 10-point Likert scale: (1 = strongly disagree/ not effective, 10 = strongly agree/ effective).

The research design as illustrated in Figure 1 presents the sequential process of the study. It begins with the conceptualisation of theoretical constructs

and the development of the instrument through the NGT. It then outlines the pretesting and pilot stages, which ensured the instrument's validity and clarity. This is followed by data collection and EFA to refine and validate the measurement model for ROC and ROHSC among SMiEs.

Summary of Research Design

The overall research design as shown in Figure 1 followed a sequential and systematic process. It began with the conceptualisation and operationalisation of constructs grounded in ORC and DOI theories. Moreover, the NGT was employed to generate and validate items for the ROHSC construct through expert consensus. The instrument then underwent two rounds of pretesting to refine and ensure its clarity, cultural relevance, and content validity. Finally, a pilot study was conducted to collect quantitative data for EFA, enabling the empirical validation of constructs and the refinement of the measurement model. This sequence ensured that data collection and analysis were theoretically aligned and methodologically rigorous.

RESULTS

EFA was conducted using IBM SPSS Statistics 27, adhering to the five-steps outline recommended by Williams et al., (2010). These steps include data preparation, factor extraction, factor rotation, interpretation, and labelling, to ensure meaningful and statistically robust factor structures.

Exploratory Factor Analysis (EFA) Results for ROC and ROHSC Constructs

EFA results are presented based on four elements: i) total variance explained by the construct, ii) the number of identified factors and their respective items, iii) factor loadings above 0.6 to ensure item relevance, and iv) internal reliability using Cronbach's alpha, with values above 0.7, indicating robust reliability (Awang et al., 2023). This approach offers a clear, validated factor structure that is essential for the effective assessment of Halal compliance readiness.

To establish ROHSC as the dependent variable, we organised the 38 original items into five main groups: (1) raw materials, advertising, and labelling; (2) workers; (3) documentation and records with internal Halal control; (4) processing areas and premises; and (5) equipment and storage. This reorganisation provides a clearer and more consistent factor structure. Although a powerful tool, factor analysis is often criticised for its reliance on researcher judgment in deciding factors, rotation methods, and item retention, which requires systematic decision-making to achieve valid results (Watkins, 2018). Hair et al., (2021) suggest that factor construction should be based on theory and prior studies, with at least three items per factor for reliability. Given that the ROHSC consists of five dimensions and was developed through a self-constructed process – NGT, the analysis and reporting of the findings are presented separately from ROC.

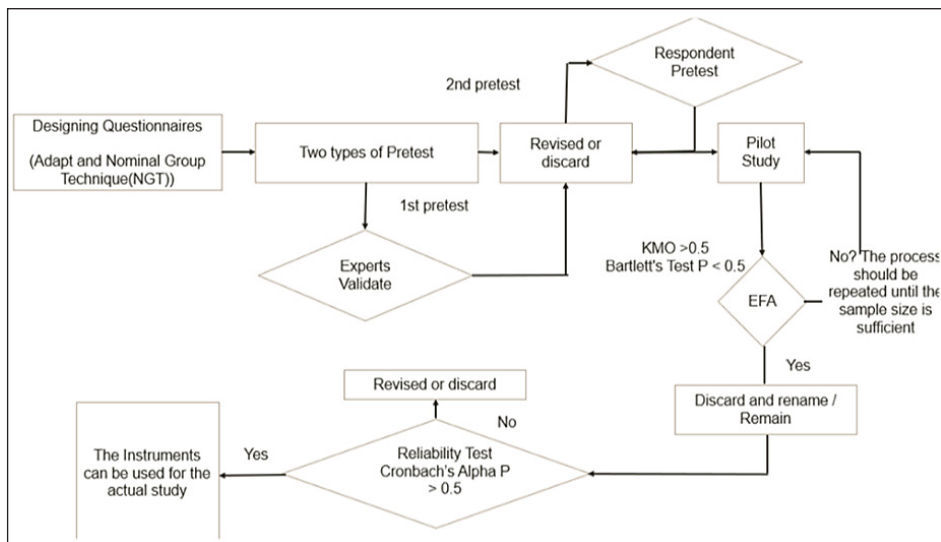


Figure 1. Research design flow from instrument development to data analysis

Sampling Adequacy and Sphericity Test through KMO and Bartlett's Test

As shown in Table 1, the KMO for the four constructs ranged from 0.590 to 0.900. All of them exceeded the common recommended cutoff of 0.500, which suggests that the sample was adequate for factor analysis (Ledesma et al., 2021; Sürücü et al., 2024). Test of Sphericity (Bartlett) was significant for all constructs ($p < .001$), indicating that the correlation matrices are appropriate for factor analysis (Hair et al., 2019; Tabachnick & Fidell, 2019). Both findings provide further evidence of the factorability of the data and the appropriateness of applying EFA to determine sub-dimensions.

Table 2 presents the results of the KMO and Bartlett's tests for the five-factor constructs of the ROHSC model. All KMO values were higher than the ideal cutoff value, suggesting the sample was adequate for EFA analysis. Specifically, group 1

(KMO = 0.878): raw materials, advertising, and labelling; group 3 (KMO = 0.886): documentation and records, and internal Halal control system; group 4 (KMO = 0.890): processing area and premises, and facilities demonstrated high factorability, group 2 (KMO = 0.800): worker and group 5 (KMO = 0.846): equipment and storage, in particular showed strong adequacy. Besides, Bartlett's Test of Sphericity was statistically significant ($p < .001$) for all groups, confirming that the inter-item correlations were sufficiently strong to justify the use of factor analysis (Hair et al., 2019).

Factor Extraction and Total Variance Explained

Factors were extracted using PCA with varimax rotation. This method was chosen to maximise the variance explained by each factor while ensuring factor independence.

Only factors with eigenvalues greater than 1 were retained to determine the number of significant factors (Ehido et al., 2020; Watkins, 2018; Williams et al., 2010). This approach captures the most meaningful underlying dimensions contributing to organisational readiness.

Total Variance Explained for ROC Construct

Table 3 presents the total variance explained for each ROC construct based on Principal PCA. For the motivation construct, one dominant factor was extracted (eigenvalue = 4.655), accounting for 77.584% of the variance, indicating a strong unidimensional structure. Then the informational assessment construct yielded three factors above the eigenvalue threshold: the first explained 58.674%, the second 8.886%, and the third

5.840%. These reflect the multidimensional nature of how information is evaluated in organisations. Otherwise, the perceived compatibility construct revealed two key factors, contributing 66.813% and 20.341% of the total variance, respectively, indicating a dual-dimensional perception of alignment with change. For channel communication, three significant factors emerged, explaining 42.466%, 14.215%, and 12.125% of the variance, demonstrating the multifaceted role of communication channels in readiness. These results highlight that constructs (motivation) show strong single-factor structures, and others (informational assessment, perceived compatibility, and channel communication) are more complex, suggesting targeted strategies may be required to address each dimension effectively.

Table 1
Result of KMO and Bartlett's Test for ROC construct

Construct	KMO Value	Bartlett's Test of Sphericity	Approx. Chi-square	df	Sig.
1. Motivation for change	0.900	Yes	684.363	15	0.000
2. Informational assessment	0.857	Yes	2871.840	171	0.000
3. Perceived compatibility	0.781	Yes	559.937	10	0.000
4. Channel communication	0.590	Yes	651.073	45	0.000

Table 2
Result of KMO and Bartlett's Test for ROHSC construct

Group	KMO Value	Bartlett's Test of Sphericity	Approx. Chi-square	df	Sig.
Group 1	0.878	Yes	936.413	28	0.000
Group 2	0.800	Yes	341.957	6	0.000
Group 3	0.886	Yes	1228.307	28	0.000
Group 4	0.890	Yes	1290.507	36	0.000
Group 5	0.846	Yes	1471.455	36	0.000

Table 3
Total variance explained for ROC's constructs

Construct	Factor	Initial Eigenvalues Total	Cumulative % of Variance
Motivation	1	4.655	77.584
Informational assessment	1	11.148	
	2	1.688	
	3	1.110	73.400
Perceived compatibility	1	3.341	
	2	1.017	87.155
Channel communication	1	4.247	
	2	1.421	
	3	1.213	68.800

Total Variance Explained for ROHSC Construct

Table 4 presents the results of the total variance explained analysis for the ROHSC construct. For Group 1, two factors were extracted with eigenvalues of 5.687 and 1.071, respectively. Together, they accounted for a cumulative variance of 84.480%, suggesting a strong and structured multidimensional interpretation of the construct. In Group 2, a single dominant factor with an eigenvalue of 3.180 explained 79.495% of the total variance, confirming a clear unidimensional construct. Then, Group 3 revealed one principal factor with an eigenvalue of 6.562, explaining 82.028% of the variance, again suggesting a coherent latent structure. Similarly, Group 4 showed a highly dominant factor (eigenvalue = 7.048) that accounted for 93.178% of the total variance, indicating extremely high internal consistency and factor clarity. Then, Group 5 followed this pattern, with a single factor explaining 95.208% of the variance

(eigenvalue = 7.183), reinforcing the presence of a strong and single-dimensional factor. Across all five groups, the extracted factors explained between 79.495% and 95.208% of total variance. These results suggest that each group within the ROHSC construct demonstrates high internal coherence and strong one-dimensionality, confirming their structural integrity and suitability for further analysis.

Rotated Factor Matrix and Factor Loadings

The EFA adopted the Rotated Factor Matrix and retained the items concerning the minimal value of factor loading 0.60 for interpretation reasons (Hair et al., 2018). Items that did not meet this criterion or that were strongly cross-loaded across the dimensions were removed to enhance the robustness of the factor structure. Therefore, the data structure was improved by clustering the items close to their factors.

Table 4
Total variance explained for ROHSC groups

Construct	Factor	Initial Eigenvalues	Cumulative % of Variance
Group 1	1	5.687	
	2	1.071	84.480
Group 2	1	3.180	79.495
Group 3	1	6.562	82.028
Group 4	1	7.048	93.178
Group 5	1	7.183	95.208

This step was made to ensure that all items in the construct were clear and interpretable.

Rotated Factor Matrix for EFA Result on ROC Constructs

A rotated solution matrix derived from the EFA identified four main constructs of the ROC framework: perceived compatibility, informational assessment, motivation for change, and communication channels. The factor analysis employed principal factor analysis with Varimax rotation and Kaiser normalisation, with the factor loadings presented in Table 5, depicting the degree to which individual items loaded onto specific constructs.

Motivation for Change Construct.

The analysis of the construct Motivation for Change yielded a single predominant factor, indicating that all items within this construct consistently loaded onto one factor. This result suggests a high level of inter-item consistency and that the items collectively represent a coherent latent aspect of motivation. Such an outcome supports the theoretical argument that

motivation for change is an unifactorial construction of organisational readiness for change, capturing the shared desire, enthusiasm, and cognitive readiness to engage in change within an organisational setting.

Informational Assessment Construct.

The analysis of the informational assessment construct identified two factors across 19 items, differing from the original three dimensions proposed in the theory. This finding aligns with Shea et al. (2014), which also focused on these two dimensions for measurement under the informational assessment construct. Following an examination of the characteristics of each item within the respective factors, and with reference to previous studies and ORC theory, the items were categorised and labelled as *task knowledge* and *resource availability*. Six items were eliminated due to factor loadings below 0.6, having fewer than three items (Awang et al., 2023), or exhibiting cross-loading (Hair et al., 2010). The discarded items were S2, RAV6, S3, S5, K3, and S1.

Table 5
Factor analysis results on ROC constructs

Label	Item	Factor			Removed Items
		1	2	3	
Motivation for Change					
M5	We are confident that all employees in the organisation support the effort to obtain Halal certification.	0.949			
M6	We believe Halal certification will bring great benefits to our organisation.	0.940			
M4	We believe Halal certification is necessary to improve our organisation's performance.	0.924			
M3	We are not worried about the change towards Halal certification.	0.911			
M2	We see Halal certification as a positive change for our organisation.	0.821			
M1	We are confident that the organisation will be able to obtain Halal certification holder status.	0.717			
Extraction Method: Principal Factor Analysis					
Rotation Method: Varimax with Kaiser Normalisation					
One factor extracted					
Label	Item	Factor			Removed Items
		1	2	3	
Informational Assessment					
K8	We understand the basic laws involved in Halal certification and the responsible authorities.	0.906			
K4	We know the roles and responsibilities of each employee in the process of obtaining Halal certification.	0.902			
K5	We understand the basic requirements that need to be complied with for food products in the context of Halal certification.	0.901			
K6	We know the procedures to follow to apply for Halal certification.	0.889			
K2	We know the finances needed to implement Halal certification.	0.841			
K7	We understand the needs relating to workforce adequacy.	0.740			
K1	We understand the length of time it takes to implement Halal certification.	0.662			
S4	To implement Halal certification compliance, organisations can monitor the progress of its implementation.	0.654			

Table 5 (continued)

RAV1	To implement Halal certification compliance, we have the necessary skills and knowledge to obtain Halal certification.	0.654		
S2	To implement Halal certification compliance, organisations can help employees adapt to these changes.	0.643	0.605	Removed
RAV5	To implement Halal certification compliance, we have enough manpower to implement Halal certification.		0.934	
RAV4	We have the facilities required to accomplish Halal certification compliance.		0.786	
RAV3	To implement Halal certification compliance, we have the necessary facilities to access the information.		0.666	
RAV2	To implement Halal certification compliance, we have enough time to implement Halal certification.		0.609	
RAV6	To implement Halal certification compliance, we have sufficient financial allocation to implement Halal certification.		-0.647	Removed
S3	Organisations can coordinate work to implement Halal certification compliance so that its implementation runs smoothly.			Removed
S5	Organisations can face challenges that may arise while implementing Halal certification compliance.			Removed
K3	We clearly understand the purpose of obtaining Halal certification for the benefit of our organisation.			Removed
S1	To implement Halal certification compliance, organisations can manage internal issues that arise while implementing this change.			Removed

Extraction Method: Principal Factor Analysis.

Rotation Method: Varimax with Kaiser Normalisation

Two factors extracted

Label	Item	Factor			Removed Items
		1	2	3	
Perceived Compatibility					
C4	The cost of Halal certification such as certification and maintenance fees are reasonable and affordable for our company.	0.964			
C5	The timeframe for obtaining Halal certification, which is between 1 to 3 months, aligns with our company's expectations and planning.	0.960			

Table 5 (continued)

C1	Halal certification aligns with our company's work processes and operations.	0.884			
C2	Information about Halal certification is easily accessible and understandable by our organisation.	0.841			
C3	Organisations understand that the Halal certification compliance process is compatible with our organisation's existing quality control practices, including raw material control, hygiene, and safety.	0.996	Removed		
Extraction Method: Principal Factor Analysis.					
Rotation Method: Varimax with Kaiser Normalisation					
One factor extracted					
Label	Item	Factor			Removed Items
		1	2	3	
Channel Communication					
RM3	The most TRUSTED source of early information to organisations regarding Halal compliance is through social media (e.g., Facebook, YouTube, TikTok, Instagram, Twitter).	0.827			
RM5	The most RELIABLE source in providing early information to organisations related to Halal compliance is indirect education (through exhibitions, expos, and Halal quiz).	0.801			
EM3	The most EFFECTIVE source in providing early information to organisations regarding Halal compliance is formal education such as workshops and Halal courses.	0.703			
RM2	The most RELIABLE source of initial information to organisations related to Halal compliance is through electronic media (such as television and radio).	0.679			
RM4	The most RELIABLE source of early information to organisations related to Halal compliance is through official government channels (e.g. portals, websites).	0.654			
EM2	The most EFFECTIVE source in providing initial information to organisations related to Halal compliance is electronic media (such as television and radio).		0.854		Removed
EM4	The most EFFECTIVE source for providing early information to organisations related to Halal compliance is through official government channels (such as portals, websites, and <i>Facebook Live</i>).		0.709		Removed

Table 5 (continued)

RM1	The most RELIABLE source of initial information to organisations related to Halal compliance is through print media (such as newspapers, magazines, and brochures).	0.842	Removed
EM1	The most EFFECTIVE source in providing initial information to organisations related to Halal compliance is print media (such as newspapers, magazines, and brochures).	0.803	Removed

Extraction Method: Principal Factor Analysis.
 Rotation Method: Varimax with Kaiser Normalisation
 Three factors extracted

Perceived Compatibility Construct.

The *perceived compatibility* construct showed that four items (C4, C5, C1, and C2) loaded strongly onto Factor 1, with values ranging from 0.841 to 0.964. Item C3 loaded heavily onto Factor 2, with a value of 0.996. However, item C3 was removed from the analysis as it did not align with any meaningful factor or dimension (Hair et al., 2010).

Channel Communication Construct.

The Channel Communication construct analysis identified three distinct factors of the communication channels construct, focusing on items related to trusted and effective sources of information for Halal compliance. Factor 1 was defined by five items (RM3, RM5, EM3, RM2, RM4), strongly emphasising social media, direct and indirect education, and electronic media as the most trusted and effective channels. However, print media and some government channels were less clearly defined and thus

removed from the final factor solution. Several items related to the effectiveness and trustworthiness of electronic and print media sources (e.g., EM2, EM4, RM1, and EM1) from Factor 2 and Factor 3 were removed because each factor retained only two items. It is generally recommended that each factor in a factor analysis ideally includes at least three items to ensure adequate construct representation and reliability (Ehido et al., 2020; Jani et al., 2023).

Rotated Factor Matrix for EFA Result on ROHSC Constructs

As shown in Table 6, the rotated factor matrix presents the results for the five groups under ROHSC. Group 1 identified two factors: "packaging and labelling" and "raw material control" under ROHSC. Specifically, item RBM3, originally linked to the first factor, was moved to the second factor after we realised its relevance only to raw material control based on the manual procedure for Malaysian Halal certification.

No items were removed during the analysis, indicating that all items meaningfully contributed to the factor structure. Next, Group 2 analysis reveals that four items strongly load onto a factor with values ranging from 0.837 to 0.934, with no items removed and renamed the "workers" factor. The same goes for group 3 with no removed item, the analysis revealed that eight items strongly loaded onto a factor, with values ranging from 0.881 to 0.926. The factor was renamed the "record management and Halal control system" as the fourth dimension of the ROHSC.

Group 4, which initially contained nine items, was extracted into four factors with strong factor loadings ranging from 0.637 to 0.853. However, only two factors were identified and selected, renamed as the "processing area" and "premises and facilities," each consisting of three items. Despite cross-loading in item RKP1, it was retained under the "premises and facilities" factor due to a higher loading value of 0.657 compared to 0.624. The decision to retain or remove items depends on the research objective and whether the items are essential for achieving the goals of the study (Piaw, 2014). If the items are considered important, they should be retained; otherwise, they should be removed. Three items (RKP5, KP1, and RKP2) were removed as factors requiring at least three items to be retained. Finally, Group 5 was extracted into two factors with nine items that loaded strongly, with values ranging from 0.833 to 0.950. However, the second factor, which contained only one item, was removed owing to cross-

loading. The remaining factor was renamed as "storage and equipment".

In summary, the rotated factor matrix for the five groups under ROHSC identified seven factors/ dimensions. Group 1 identified two factors: "packaging and labelling" and "raw material control." Group 2 retained the "workers" dimension, while Group 3 formed the "record management and Halal control system" factor. Group 4 was split into two factors: "processing area" and "premises and facilities." Finally, Group 5 formed the "storage and equipment" factor. Overall, four items were removed, leaving 34 of the original 38 items.

Reliability Test: Cronbach's Alpha

To measure this latent construct, its internal validity was evaluated using the EFA results (Awang et al., 2023; Hair et al., 2019). Internal validity refers to the degree to which similar questions produce consistent results and accurately measure what they are intended to measure. A Cronbach's alpha coefficient greater than 0.70 is considered acceptable for internal consistency (Awang et al., 2023).

Table 7 reports the reliability findings for the constructs in ROC and ROHSC. The Cronbach's alpha coefficients for all constructs were excellent, exceeding 0.70 (Nunnally & Bernstein, 1994; Hair et al., 2019). Specifically, the analysis yielded a Cronbach's alpha of 0.920 for the 28 items under ROC and 0.988 for the 34 items under ROHSC. These results indicate excellent reliability and strong internal consistency

Table 6
Factor analysis result for ROHSC groups

Group 1		Factor				Removed Item	Rename Dimension
Label	Item	1	2	3	4		
RPP2	The organisation is ready to ensure that the labelling meets Malaysian Halal standards.	0.896					
RPP4	Organisations are willing to ensure that toxic packaging materials are not used.	0.875					Packaging and labelling
RPP1	The organisation is willing to ensure that the packaging illustration complies with Sharia.	0.868					
RPP3	The organisation is willing to ensure that the name of the product is not synonymous with non-Halal terms such as "ham" or "Bak Kut Teh".	0.865					
RBM3	The organisation is ready to ensure that the raw materials used match the raw material control records including the manufacturer's information such as name, address, and Halal certificate.	0.670				RBM3 realign to factor 2 (Raw Material Control)	
RBM1	Organisations are ready to ensure that critical raw materials used such as meat, poultry and gelatin have Halal certification.		0.900				
RBM2	The organisation is ready to ensure that the raw materials used are the same as those that will be declared to the authorities.		0.824				Raw Material Control
RBM4	The organisation is ready to ensure that illegal raw materials are not used.		0.808				

Extraction Method: Principal Factor Analysis.

Rotation Method: Varimax with Kaiser Normalisation.^a

a. Rotation converged in 3 iterations.

Group 2		Factor				Removed Item	Rename Dimension
Label	Item	1	2	3	4		
RP4	The organisation is ready to ensure that all employees have a record of typhoid injection and a Food Handler Training Certificate.	0.934					
RP3	The organisation is willing to ensure that all employees practice hygiene, including frequent hand cleaning, wearing clean clothes, and following sanitation protocols.	0.922					Worker
RP1	The organisation is ready to ensure that all employees attend Halal awareness training.	0.869					
RP2	The organisation is ready to ensure that there are Muslim employees on duty in the processing area throughout the shift.	0.837					

Extraction Method: Principal Factor Analysis.

1 factor extracted.

Table 6 (continued)

Group 3		Factor				Removed Item	Rename Dimension
Label	Item	1	2	3	4		
SKH4	Organisations are ready to ensure that traceability control systems are implemented to identify the producers of each raw material.		0.926				
RDR3	Organisations are prepared to ensure that all raw material transaction documents, including invoices and receipts, are carefully recorded and well-kept.		0.923				
SKH2	The organisation is willing to ensure that the Halal policy is realised.		0.915				
RDR4	Organisations are prepared to ensure that product production records are documented.		0.912				
RDR1	Organisations are ready to keep Halal files in updated condition (e.g. ensuring all certifications, employee health records, and audit reports).		0.899				Record management and Halal control system
SKH1	The organisation is ready to ensure that the internal Halal control system manual is developed and implemented in writing.		0.897				
SKH3	The organisation is ready to ensure that the raw material control system is well implemented.		0.893				
RDR2	Organisations are ready to ensure that pest control activities are recorded.		0.881				

Extraction Method: Principal Factor Analysis.

a. 1 factors extracted.

Group 4		Factor				Removed Item	Rename Dimension
Label	Item	1	2	3	4		
RKP1	Organisations are ready to ensure that the processing area is free of dubious raw materials.	0.840				Removed	
RKP2	Organisations are ready to ensure that the processing area is free of dubious hardware.	0.820					
RKP4	The organisation is ready to ensure that the processing area is free of elements of worship such as religious symbols, worship statues, and religious ceremonial materials.		0.805			Removed	
RKP3	The organisation is ready to ensure that the processing area is always clean.		0.639				Processing area
RPK1	The organisation is ready to ensure the premises have basic facilities such as prayer rooms, toilets, pantries, and changing rooms.		0.637				

Table 6 (continued)

RPK3	The organisation is ready to ensure it is designed to prevent cross-contamination such as animals, cats, and pests.		0.704		
RPK4	The organisation is ready to ensure that ceilings, floors, walls, and windows are suitable, clean, and well maintained on an ongoing basis.		0.699		Premises and facilities
RPK2	The organisation is ready to ensure that the premises are not cross-contaminated with sewage plants, animal farms, and non-Halal premises.	0.624	0.657		0.657 taken
RKP5	The organisation is ready to ensure that the processing area has control mechanisms for employees living inside the premises, such as periodic inspections and cleaning protocols according to Halal standards.		.853		Removed

Extraction Method: Principal Factor Analysis.

Rotation Method: Varimax with Kaiser Normalisation.^a

a. Rotation converged in 6 iterations.

Group 5		Factor				Removed Item	Rename Dimension
Label	Item	1	2	3	4		
RS1	The organisation is ready to ensure that there is no mixing of Halal and non-Halal ingredients by using separate storage and labelling.	0.950					Storage and Equipment
RS5	The organisation is ready to ensure that finished products and expired raw materials are disposed of from storage.	0.948					
RS4	The organisation is ready to ensure that raw materials are stored at the appropriate temperature, such as perishable goods below 5 °C.	0.942					
RA2	The organisation is ready to ensure that the equipment is cleaned after use.	0.930					
RS3	Organisations are willing to ensure that the storage of raw materials and ready products is segregated.	0.921					
RS2	Organisations are ready to ensure that finished products are stored with production date marking.	0.906					
RA4	The organisation is willing to ensure that the equipment is in a clean condition before use.	0.876					
RA1	Organisations are willing to ensure that animal-based equipment, such as bristle brushes, is not used.	0.833					
RA3	Organisations are prepared to ensure that equipment that can cause cross-contamination, such as rusty equipment, is not used.	0.705	0.666			Removed	

Extraction Method: Principal Factor Analysis.

a. 4 factors extracted.

Table 7
Reliability statistics for ROC and ROHSC variable

Emergent Constructs/ Factors	Cronbach's Alpha	N of Items
Motivation for change	0.938	6
Informational assessment	0.943	13
Perceived compatibility	0.929	4
Efficient channel communication	0.831	5
Total for ROC	0.920	28
Readiness organisation for Halal standard compliance (ROHSC)	0.988	34

for both instruments (Hair et al., 2021), confirming the robustness of the tools used in this research to proceed with the actual survey.

DISCUSSION

Following the EFA, the high factor loadings of each item indicated strong correlations with their respective factors, confirming the validity of the measurement. This validation confirms that the underlying factors are conceptually consistent with the theoretical domains proposed in Weiner's (2020) ORC model. Rather than being a purely statistical endeavour, this procedure served to provide an empirical separation of the core dimensions and to better refine the structure conceptually. Notably, items that failed to meet the minimum loading threshold or presented high cross-loadings were excluded to enhance the coherence and interpretability of the measurement model. This refinement improved the internal consistency of the remaining items, ensuring each one is conceptually relevant and consistent with the overall construct.

The second factor is informational assessment. Within this construction,

two of the original three dimensions, task knowledge and resource availability, were retained, while the third dimension (situational) from ORC theory was excluded. Although Weiner's (2020) ORC model conceptualises situational factors as determinants of change efficacy, this study retained only task knowledge and resource availability. Situational factors, though theoretically relevant, did not emerge as a distinct factor in the context of this study and were thus excluded from the final model. This refinement, empirically supported by the EFA results, suggests that among SMiEs in Malaysia, readiness for Halal compliance is primarily determined by what organisations know about their tasks and the resources they possess, rather than by situational contingencies. However, this is not surprising, as previous studies have measured informational assessment using only two dimensions, task knowledge and resource availability (Hannon et al., 2020; Shea et al., 2014).

This finding reinforces Weiner's (2020) view that readiness is context-dependent and that the most salient aspects of change efficacy vary by organisational

size and environment. For SMiEs, practical knowledge and access to resources appear to be stronger determinants of readiness than broader situational factors. This result aligns with Jamai et al. (2022) and Md Nawi et al. (2023), who noted that resource adequacy often drives operational readiness in small firms.

Furthermore, several theoretically relevant items, such as organisational coordination, the ability to manage internal issues, and clarity of purpose, did not load significantly on any single factor and were therefore removed. This outcome suggests a disconnect between how situational readiness is conceptualised in theory and how it is experienced by SMiEs in practice. Unlike larger organisations, SMiEs often operate with minimal formal structures and limited resources, which may influence their perceptions of internal coordination and long-term strategic planning (Abd Rahman et al., 2017; Jamai et al., 2022; Md Nawi et al., 2023).

Furthermore, the analysis produced four distinct constructs that are consistent with the theoretical dimensions in the ORC and DOI models. In particular, the identification of four factors for ROC and seven for ROHSC reflects the readiness of Halal compliance among SMiEs. Motivation for change and informational assessment represent the psychological readiness dimensions. Following this, perceived compatibility reflects the cognitive alignment between the Halal compliance and existing organisational practices. At the same time, efficient channel communication represents

the structural communication processes that facilitate Halal compliance implementation. Collectively, these constructs illustrate how both psychological and structural factors interact to shape the overall readiness of SMiEs in adopting and maintaining Halal compliance.

This alignment reinforces that readiness among SMiEs operates as both a collective belief system and an operational capacity to act, which is consistent with Weiner's (2020) conceptualisation of ORC and supported by empirical validations such as Jo et al. (2023) and Shea et al. (2014). The findings further indicate that readiness for Halal compliance among SMiEs is shaped by the integration of psychological and structural dimensions, reflecting both the motivational drive to comply and the organisational mechanisms that enable implementation. This is consistent with Abd Rahman et al. (2017), who emphasised that perceived benefits and structural mechanisms such as traceability systems collectively enhance readiness for Halal assurance system implementation. Nevertheless, while SMiEs demonstrate positive intentions and awareness toward Halal compliance, the supporting structural and communication systems remain limited. This suggests a gap between their willingness to comply and their actual capacity to implement it effectively.

These insights emphasise the need for targeted interventions that enhance knowledge and motivation, strengthen communication channels, and integrate procedures to sustain Halal certification

readiness. Such an integrated perspective advances both ORC and DOI frameworks by demonstrating how belief systems and structural processes interact to shape organisational readiness within the Halal industry context.

In addition, the EFA for the ROHSC framework identified seven critical dimensions for assessing an organisation's readiness for Halal compliance. These dimensions include "packaging and labelling," "raw material control," "workers," "record management and Halal control system," "processing area," "premises and facilities," and "storage and equipment." The identified dimensions resonate with earlier work by Latif et al. (2014) and Arieftiara et al. (2022), who highlighted similar operational readiness areas as key determinants of Halal compliance success. Interestingly, the empirical separation of raw material control and packaging into distinct factors suggests that respondents do not perceive these as part of a unified process. This likely reflects the operational reality in SMiEs, where packaging is treated as a final-stage activity rather than an extension of material control. Such findings highlight the importance of adapting theoretical models to fit sector-specific practices. Additionally, the RBM3 item (firm is ready to verify that all raw materials align with control records) was reassigned from the packaging dimension to raw material control, based on a clearer conceptual alignment in line with the Malaysian Halal certification manual. This finding extends ORC's applicability beyond behavioural change into operational domains, indicating how structural readiness

complements psychological readiness in the Halal context. This reassignment highlights how EFA helps ensure that the constructs are statistically assessed and conceptually grounded in the operational realities and target populations. Overall, out of the 38 items in the ROHSC construct, four were removed due to weak loadings or cross-loadings, leaving 34 items for further analysis.

After analysing the complete set of variables (ROC and ROHSC), the framework was refined by removing 15 items, resulting in 62 items out of the original 77. This streamlined structure provides a comprehensive tool for evaluating organisational readiness for compliance with Halal standards. The EFA highlights emergent factors with high Cronbach's alpha values (0.965-0.988), enhancing the understanding of factors influencing ROC and ROHSC.

The validated ROC and ROHSC frameworks from this study offer a practical tool for assessing Halal compliance readiness among SMiEs. This operationalisation demonstrates how the ROC framework can be translated into measurable dimensions for Halal compliance, bridging the gap between theoretical readiness constructs and practical assessment tools. Beyond self-assessment, agencies such as training providers can also use this instrument to better determine SMiEs' readiness for Halal standard compliance. These findings also have implications for authorities and Halal promoters' agencies such as JAKIM and Halal Development Corporation. The emergence of constructs such as "efficient

channel communication” highlights the role of not just technical readiness but also the clarity and reliability of communication throughout the certification process.

While this study offers a solid empirical foundation for understanding readiness for Halal compliance, several limitations must be acknowledged. First, the exclusion of certain dimensions, such as situational factors, may reflect context-specific constraints rather than their true irrelevance. Future research should further explore these dimensions using new items. Second, this study is limited to the exploratory stage, as the data were drawn from a pilot study and only subjected to EFA.

CONCLUSION

This study developed and validated a measurement instrument for assessing organisational readiness for Halal compliance among SMiEs in Malaysia. The study details the survey questionnaire development process, including pretest and pilot study stages, to ensure its validity and reliability. EFA was conducted to identify key factors influencing readiness, revealing the underlying structures related to ROC and ROHSC. The results highlight distinct factors, each explaining significant variance and enhancing the understanding of organisational readiness for change and Halal compliance.

In conclusion, the identified factors align well with the objectives of the study and findings from the EFA offer valuable insights into the critical constructs of ROC and ROHSC. The validated framework

can guide SMiEs owners and relevant authorities in diagnosing readiness gaps and designing targeted interventions to improve Halal compliance. Future research should expand on this work through confirmatory factor analysis and application in broader Halal-related industry contexts.

Ethics Review Board Clearance

This study complied with the ethical guidelines and was approved by the Universiti Putra Malaysia Ethics Committee (reference number JKEUPM-2024-663).

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Predictors of Socioemotional Functioning among Typically Developing Siblings of Autistic Children in Central Selangor, Malaysia

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ABSTRACT

The marked increase in the prevalence of autistic children in Malaysia (Shair et al., 2024) highlights that there is a growing number of typically developing siblings whose social-emotional development might be affected due to living with an autistic sibling. Therefore, there is a critical need to examine the socioemotional functioning of the typically developing siblings with an autistic sibling. This study aimed to examine predictors of socioemotional functioning among typically developing siblings of children with autism. A quantitative cross-sectional survey was conducted using questionnaires that incorporated three research instruments: the Parental Authority Questionnaire (PAQ), the Strengths and Difficulties Questionnaire (SDQ), and the Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA). This study took place in schools offering the Special Education Integration Programme in Central Selangor, Malaysia. A total of 163 respondents, aged 10 to 17, were selected through the fishbowl sampling method. Findings revealed that paternal permissive parenting style and emotion regulation were significant predictors of the socioemotional functioning of typically developing siblings, with $\beta = -.205$ and $\beta = .241$, respectively. These results provide valuable insight into the specific roles of paternal permissive parenting and emotion regulation in influencing the socioemotional development of typically developing siblings. Furthermore, the study highlights the potential value of culturally sensitive school- and family-based interventions that strengthen paternal engagement and emotion regulation skills among siblings of autistic children.

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INTRODUCTION

Siblings often have a strong influence on a child's social, emotional, and cognitive skills. They often shape one another's growth more than parents do due to extensive shared time and daily interactions (Buist et al., 2013; Dirks et al., 2015). Typically developing siblings of autistic children grow up in distinctive family environments shaped by the challenges and dynamics of autism. These unique environments influence how they feel, how they build relationships, and how they develop emotionally and socially.

Research consistently shows that typically developing siblings of autistic children face various emotional, social, and psychological challenges. They often experience higher stress levels (Gorjy et al., 2017; Mokoena & Kern, 2022; Quatrosi et al., 2023; Shivers et al., 2019; Singh et al., 2020), show weaker social and emotional skills (Gorjy et al., 2017; Habelrih et al., 2018; Schmeer et al., 2021; Singh et al., 2020; Tsai et al., 2018; Watson et al., 2021), experience anxiety and depression (Inam et al., 2017; Shivers & McGregor, 2019; Shivers et al., 2019; Singh et al., 2020) and report lower mental well-being and poorer quality of life (Quatrosi et al., 2023; Shivers et al., 2019). In Malaysia, typically developing siblings of autistic children similarly report ambivalent emotions, communication barriers, and reliance on emotion regulation coping (Chu et al., 2021). Across Southeast Asia, siblings of children with special needs describe heightened responsibilities, emotional conflict, and the importance of extended-family support

(Ventic et al., 2025). Social stigma often contributes to shame, depression, and reluctance to seek help among both mothers and typically developing siblings (Tsai et al., 2018; Vidojevic et al., 2014). Within Malaysia, limited public awareness and enduring stigma regarding autism spectrum disorder (ASD) further intensify these burdens (Low et al., 2021).

In addition, typically developing siblings of autistic children often have fewer opportunities for leisure activities, struggle with poor sleep, and get limited respite time (Pavlopoulou & Dimitriou, 2019). Their relationships with autistic siblings tend to be strained, showing less warmth and closeness (Shivers et al., 2019), while some feel distant from their parents due to feeling ignored, lacking emotional connection, or finding it hard to communicate (Dansby et al., 2017). Besides, typically developing siblings of children also tend to blame themselves and be overly self-critical (Gorjy et al., 2017), show lower self-worth (Inam et al., 2017; Shivers et al., 2019), and struggle to adapt to challenges (Caner et al., 2024; Habelrih et al., 2018).

Bronfenbrenner's socioecological framework (1979) emphasises the pivotal role of parents as the most influential figures in shaping children's socioemotional developmental trajectories. Within the microsystem, parents act as critical determinants of children's socioemotional development (Istianti et al., 2023; Roy & Giraldo-García, 2018). The specific parenting style and practices adopted by parents lead to distinct socialisation

processes that ultimately shape children's behaviours, self-perceptions, and social-emotional competencies. These early and ongoing interactions within the family environment have a profound and lasting impact on children's socioemotional growth, underscoring the importance of parental engagement and parenting approaches in determining their children's developmental trajectories. Figure 1 illustrates the conceptual framework guiding this study.

Parenting style is a key predictor of children's socioemotional outcomes (Gross & Ford, 2024; Luo et al., 2021). Different parenting styles have distinct implications for typically developing siblings of autistic children. Authoritative parenting, which is characterised by warmth, clear expectations, emotional bonding, and open communication, is consistently identified as the most effective approach for promoting children's socioemotional development

and psychological well-being (Agoha et al., 2021; Luo et al., 2021; Reyes-Wapano, 2021; Vasiou et al., 2023; Zhang et al., 2020). In Malaysia, Rahman and Jermadi (2021) found that parents of autistic children commonly adopt this style, which supports positive emotional outcomes for both typically developing siblings and autistic children. Similarly, Poirier et al. (2024) revealed that authoritative parenting fosters resilience and socioemotional skills, while Benseny Delgado (2024) associated it with lower family stress, stronger socioemotional functioning, and improved overall quality of life.

In response to caregiving stress, some parents adopt authoritarian parenting, which is characterised by strict control and high demands (Benseny Delgado, 2024; Inam et al., 2017). Although this approach aims to maintain order, it is often associated with greater anxiety and behavioural difficulties

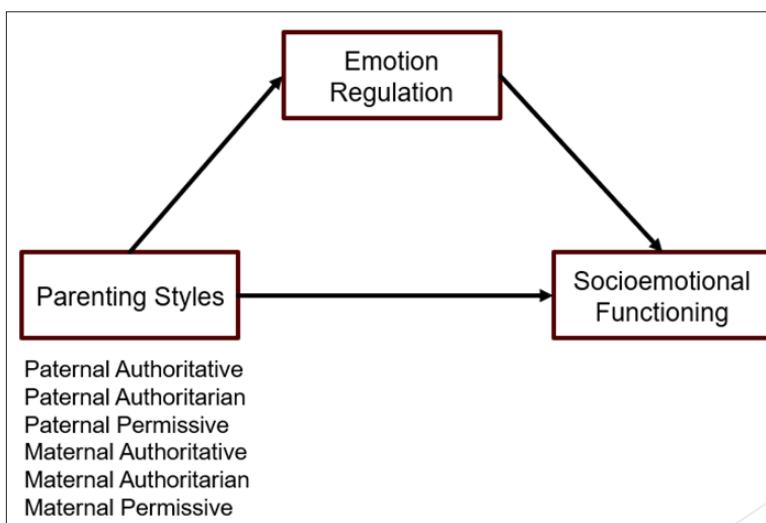


Figure 1. Conceptual framework

among typically developing siblings of autistic children (Benseny Delgado, 2024; Crowell et al., 2019; Rahman & Jermadi, 2021). Nonetheless, in certain contexts, authoritarian parenting encourages social behaviour and reduces behavioural issues (Mohammadi & Zarafshan, 2014), which suggests that its effects depend on context and implementation. Typically developing siblings of autistic children raised in permissive environments marked by low structure, unclear boundaries, and inconsistent expectations face greater socioemotional difficulties, especially in the context of having an autistic sibling (Benseny Delgado, 2024; Mohammadi & Zarafshan, 2014; Poirier et al., 2024).

Culturally, Malaysian collectivist values emphasise family harmony and interdependence. Parenting approaches such as “guan” care buffer emotional risks for typically developing siblings of autistic children by framing structured or controlling behaviours as expressions of affection and moral guidance rather than restriction (Masiran, 2022; Nainee et al., 2021). At the same time, these cultural expectations can intensify sibling responsibilities and role obligations, potentially amplifying stress. Consequently, it is essential to consider how parenting styles influence the socioemotional functioning of typically developing siblings of autistic children within this cultural context.

Emotion regulation refers to the processes by which individuals manage and adjust their emotional responses to meet situational demands. It involves reducing or controlling the intensity and frequency of

emotional arousal when necessary (Gross & Ford, 2024). Emotion regulation is a key component of children’s socioemotional competence, shaping how they respond to emotions, interact with others, and navigate complex social situations. For typically developing siblings of autistic children, emotion regulation is particularly important, as these siblings often experience heightened stress and emotional strain arising from the unique demands of living with an autistic sibling (Chu et al., 2023; Mokoena & Kern, 2022; Singh et al., 2020). Adaptive emotion regulation skills serve as a protective factor, safeguarding socioemotional well-being and supporting positive adjustment (Dalimunthe & Nasution, 2023; Hamaidi et al., 2021; McQuade & Breau, 2017; Stover et al., 2024). It acts as a protective buffer against stress (Gross & John, 2003; Polizzi & Lynn, 2021) and mitigates depressive symptoms in at-risk adolescents (Aune et al., 2023). Conversely, maladaptive emotion regulation is associated with internalising problems, self-harm, and broader psychopathology (Cheung et al., 2020; Kennedy & Brausch, 2024; Lim et al., 2023; Yadlosky et al., 2023; Zafar et al., 2021).

While the links between parenting, emotion regulation, and socioemotional outcomes are well documented internationally, their specific roles among Malaysian typically developing siblings remain underexplored. Existing studies have primarily focussed on parental or family functioning and have been conducted largely in Western contexts (Watson et al., 2021), leaving a limited understanding of local dynamics.

With the prevalence of ASD in Malaysia rising sharply from 9,105 diagnosed students in 2018 to 14,073 in 2020 (Ministry of Education, 2020), more typically developing siblings are likely to encounter distinct socioemotional challenges. Accordingly, this study aims to investigate how parenting styles and emotion regulation predict socioemotional functioning among Malaysian typically developing siblings of autistic children, while providing culturally grounded insights to guide family and school-based interventions.

METHODOLOGY

Procedures and Participants

The present study aims to explore the interplay between parenting styles, emotion regulation, and socioemotional functioning among typically developing siblings of autistic children within a sample residing in Central Selangor, Malaysia. This research employed a quantitative approach with a cross-sectional survey and correlational design. The study was conducted in the central zone of Selangor, Malaysia, as this zone has the highest concentration of Special Education Integration Programme (Program Pendidikan Khas Integrasi) schools and a dense population.

The targeted population for this study consisted of 10 to 17-year-old typically developing siblings of autistic students. The sample size for this study was determined using the Krejcie and Morgan (1970) formula, which recommended a minimum of

132 respondents. Participants were selected based on the following criteria:

- i. must be a typically developing sibling of autistic children and,
- ii. aged between 10 to 17 years and,
- iii. NOT be sitting for the Sijil Pelajaran Malaysia (Malaysian Certificate of Education) examination during the academic year of the study.

Ultimately, a total of 163 respondents were recruited through the fishbowl sampling method.

Alongside data collection on the primary variables, background information about the respondents was also obtained. This comprehensive approach allowed for a deeper understanding of the participants and enriched the context for subsequent analysis.

Measures

Three well-established instruments were used in this study: the Parental Authority Questionnaire (PAQ) by Buri (1991), the Strengths and Difficulties Questionnaire (SDQ) by Goodman (1997), and the Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA) by Gullone and Taffe (2012). All instruments were originally in English. To make them culturally relevant and accessible, the PAQ and ERQ-CA were translated into both Malay and Chinese. The SDQ was translated only into Malay, as a validated Chinese version was already available. The translation process followed Brislin's (1970) back-translation method to ensure both linguistic and cultural accuracy.

Parental Authority Questionnaire (PAQ; Buri, 1991)

The PAQ measures parenting styles and behaviours. It is a reliable and valid instrument developed by Buri in 1991 based on Baumrind's (1967) three main styles: authoritative, authoritarian, and permissive. Buri (1991) reported Cronbach's alpha values between 0.74 and 0.87 for paternal styles, and between 0.78 and 0.86 for maternal styles, showing strong internal consistency.

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997)

The SDQ is widely used to assess children's emotional and behavioural functioning. In this study, participants completed the self-report version to describe their own socioemotional functioning. This version has shown good internal consistency, with Cronbach's alpha values between 0.70 and 0.75 (Koskelainen et al., 2000; Theunissen et al., 2019). Although the self-report version is designed for children aged 11 and above, Hobbs and Laurens (2020) found that its psychometric properties are also reliable for children aged 9 to 10.

The Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA; Gullone & Taffe, 2012)

The ERQ-CA measures emotion regulation strategies in children and adolescents. It focusses on how young people use specific strategies to manage their emotions and offers insight into their coping skills

and emotional well-being. The tool has demonstrated high internal consistency and stability, confirming its suitability for use with children and adolescents.

Data Collection

Data for this study were collected through a structured questionnaire survey. Approval was first obtained from the Education Planning and Research Division of the Ministry of Education Malaysia, and then ethical clearance was obtained from the Jawatankuasa Etika Universiti Putra Malaysia (Ethics Committee of Universiti Putra Malaysia). Following this, a pilot study was conducted. The internal consistency result of the pilot study is illustrated in Table 1, where all instruments exhibited satisfactory or high reliability ($\alpha > .70$).

After the pilot study, permission was acquired from the Selangor Education Department to conduct the study in special education integration programme schools located in central Selangor. Additionally, approval was obtained from the head of schools at the selected special education integration programme schools. Upon receiving approval from the head of school, a briefing session was held with the special education integration programme head teachers to explain the study's objectives and procedures. Following this, hard copy survey questionnaires, respondent information sheets, informed consent forms, and guardian/parent consent letters were distributed to the parents of autistic children to bring back to the participants. After the two weeks, the completed questionnaires

Table 1
Reliability coefficients for all the study instruments used in the pilot study

Instruments	Number of items	Cronbach's Alpha
Parenting styles		
Paternal authoritative	10	0.80
Paternal authoritarian	10	0.75
Paternal permissive	10	0.72
Maternal authoritative	10	0.82
Maternal authoritarian	10	0.79
Maternal permissive	10	0.73
Emotion regulation	10	0.80
Socioemotional functioning	25	0.75

and consent forms were collected from the special education integration programme head teachers. This systematic approach ensured that the data collection process was thorough, ethical, and compliant with all necessary regulations.

Data Analysis

The data were analysed using IBM Statistical Package for Social Sciences (SPSS) software, version 29.0.0.0. The analytical process began with Exploratory Data Analysis (EDA) to assess the normality of the data. Following EDA, descriptive statistical analyses were conducted to summarise the background information of the respondents and to examine the patterns of the main variables. Then Pearson Correlation analysis was used to determine the strength and direction of the relationship between parenting styles, emotion regulation and socioemotional functioning among the typically developing siblings of autistic children. The next step is to conduct multiple regression analysis to identify the significant predictors of socioemotional

functioning among typically developing siblings.

RESULTS

Level of Socioemotional Functioning among Typically Developing Siblings of Autistic Children

Table 2 presents the distribution of socioemotional functioning levels among the typically developing siblings of autistic children, revealing a relatively even spread across low, moderate, and high socioemotional functioning categories. Specifically, 34.4% of respondents reported low levels of socioemotional functioning, indicating that over one-third of typically developing siblings are struggling with challenges in managing their emotions, maintaining positive social relationships, or adapting to the complex family environment associated with having an autistic sibling. Meanwhile, 31.9% of the participants fell into the moderate socioemotional functioning category, and 33.7% of typically developing siblings exhibited high levels of socioemotional functioning.

Table 2

Level of socioemotional functioning among the typically developing siblings (n=163)

Variables	n	%	Mean	SD	Min	Max
Low (1.00 - 1.23)	56	34.4	17.09	5.96	6	32
Moderate (1.24 - 1.51)	52	31.9				
High (1.52 - 1.95)	55	33.7				

Predictors of Socioemotional Functioning among Typically Developing Siblings of Autistic Children

Multiple linear regression was used to test the predictors of socioemotional functioning among the typically developing siblings. The results are shown in Table 3, where the overall regression was statistically significant and fitted the regression model with $F(4, 158) = 6.766, p < .001$.

The correlations between parenting styles, emotion regulation and socioemotional functioning among the typically developing siblings of autistic children are presented in Table 4. The findings delineated that paternal authoritative parenting style and maternal authoritative parenting style have significant positive relationship with socioemotional functioning among the typically developing siblings with $r = .171, p < .05$ and $r = .223, p < .01$ respectively, while paternal permissive parenting style

have significant negative relationship with socioemotional functioning among the typically developing siblings with $r = -.209^{**}, p < .01$. The results demonstrated that more paternal authoritative or more maternal authoritative would cause higher socioemotional functioning among the typically developing siblings. On the contrary, the higher level of paternal permissiveness would cause the lower level of socioemotional functioning among the typically developing siblings of autistic children. Meanwhile, paternal authoritarian parenting style, maternal authoritarian parenting style and maternal permissive parenting style were not significantly correlated to the socioemotional functioning of the typically developing siblings. Whereas emotion regulation is positively correlated to socioemotional functioning among the typically developing siblings of autistic children ($r = .285, p < .01$). This

Table 3

ANOVA analysis for regression model

	Sum of square	df	Mean square	F	Sig
Regression	2.239	4	0.560	6.766	<0.001 ^b
Residual	13.072	158	0.083		
Total	15.311	162			

Table 4

Relationship between parenting styles, emotion regulation and socioemotional functioning among typically developing siblings (n=163)

Variable	SEF	
	r	p
Paternal authoritative PS	0.171*	<0.05
Paternal authoritarian PS	-0.133	>0.05
Paternal permissive PS	-0.209**	<0.01
Maternal authoritative PS	0.223**	<0.01
Maternal authoritarian PS	-0.004	>0.05
Maternal permissive PS	-0.124	>0.05
ER	0.285**	<0.01

Note. * $p < .05$ Correlation is significant at the 0.05 level (2-tailed).

** $p < .01$ Correlation is significant at the 0.01 level (2-tailed).

PS - parenting styles

demonstrated that typically developing siblings who reported to a higher level of emotion regulation would have a higher level of socioemotional functioning.

Table 5 shows that out of the four predictors of socioemotional functioning among typically developing siblings, only paternal permissive parenting style and emotion regulation were statistically significant in predicting the socioemotional functioning of the typically developing siblings with $\beta = -0.205$ and $\beta = 0.241$, respectively. The unstandardised coefficients for paternal permissive parenting style and emotion regulation are -0.119 and 0.208, respectively. This indicated that for every unit increase in paternal permissive parenting style score, a 0.119 unit decrease in socioemotional functioning score and for every unit increase in emotion regulation score, there is a 0.208 unit increase in socioemotional functioning score. Paternal

permissive parenting style and emotion regulation explained 14.6% ($R^2 = 0.146$) of variance in socioemotional functioning of the typically developing siblings.

DISCUSSION

This study examined the roles of parenting styles and emotion regulation on socioemotional functioning among the typically developing siblings of autistic children. The current findings show that most typically developing siblings reported low levels of socioemotional functioning. This existing result is supported by substantial existing studies in which the SEF among the typically developing siblings of autistic children is low (Caner et al., 2024; Quatrosi et al., 2023; Shivers et al., 2019). However, the finding also indicated that the difference between the low level of socioemotional functioning and the high

Table 5

Multiple linear regression analysis results on socioemotional functioning (n=163)

Model	Unstandardised coefficient		Standardised coefficient		Collinearity statistics		
	B	Std. Error	Beta (β)	t	Sig	Tolerance	VIF
(Constant)	0.648	0.270		2.398	0.018		
Paternal authoritative	0.072	0.071	0.121	1.015	0.312	0.380	2.631
Paternal permissive	-0.119	0.043	-0.205	-2.739	0.007	0.963	1.038
Maternal authoritative	0.035	0.069	0.062	0.504	0.615	0.361	2.772
Emotion regulation	0.208	0.067	0.241	3.111	0.002	0.897	1.115

Note. $R^2 = .146$; adjusted $R^2 = .125$; $[F(4, 158) = 6.766, p < .001]$

level of socioemotional functioning among the typically developing siblings is only 0.7%. This narrow variance might be due to some typically developing siblings gaining a positive effect from living with an autistic sibling, as demonstrated in the studies of Gorjy et al. (2017), Mokoena and Kern (2022), and Schmeer et al. (2021).

The results also showed that both paternal and maternal authoritative parenting styles were positively correlated with the socioemotional functioning of typically developing siblings. This means that higher use of authoritative parenting by either parent is associated with better socioemotional functioning in typically developing siblings. These findings are consistent with many previous studies, which have found that authoritative parenting is one of the most effective approaches for promoting children's social, emotional, and psychological well-being (Agoha et al., 2021; Benseny Delgado, 2024; Luo et

al., 2021; Rahman & Jermadi, 2021; Reyes-Wapano, 2021; Vasiou et al., 2023; Zhang et al., 2020).

Similarly, in families with a child diagnosed with ASD, authoritative parenting remains the most effective style (Benseny Delgado, 2024). Findings of Vasiou et al. (2023) and Zhang et al. (2020) delineated that authoritative parenting styles were positively correlated to children's socioemotional development. Furthermore, Luo et al. (2021) also revealed that when parents adopted an authoritative style, children achieved better psychological adjustment, displayed stronger social skills, and exhibited fewer behavioural and emotional difficulties. Furthermore, a review by Reyes-Wapano (2021) proclaimed that authoritative parenting styles were positively correlated to social-emotional competence. All these existing research findings supported the current result, which highlighted that either paternal or maternal authoritative parenting

styles would positively support the healthy development of socioemotional functioning among the typically developing siblings.

Authoritative parents who are always responsive and warm, provide clear expectations and consistent support, and create a secure environment for typically developing siblings to openly express their feelings and challenges. Through open communication, active listening, and guidance, authoritative parents help typically developing siblings develop essential skills such as effective communication, conflict resolution and empathy, where these skills are crucial for building healthy socioemotional functioning. Besides, the balance of structure and support provided by authoritative parents equips typically developing siblings with adaptive coping skills, enabling them to handle challenges and stress more effectively. By fostering a nurturing yet structured environment, authoritative parents promote healthy socioemotional functioning among the typically developing siblings (Benseny Delgado; 2024; Rahman & Jermadi; 2021).

The current finding of the negative and significant relationship between paternal permissive parenting style and socioemotional functioning among the typically developing siblings exhibited that the higher level of paternal permissive would cause the lower level of socioemotional functioning among the typically developing siblings of autistic children and is supported by the existing studies which shown that permissive parenting style was negatively and significantly associated with children's

various socioemotional development (Agoha et al., 2021; Liu & Merritt, 2018; Vasiou et al., 2023; Yang, 2024). Typically developing siblings navigate intricate emotional landscapes which require different coping strategies. The presence of a permissive father exacerbates feelings of insecurity or lack of guidance (Vasiou et al. 2023). Fathers who participate less frequently result in typically developing siblings perceiving paternal permissiveness as a lack of guidance in their challenging environment. Consequently, typically developing siblings might internalise the permissiveness from fathers more negatively, which ultimately affects their socioemotional functioning significantly.

Many previous studies support the current findings. Emotion regulation plays an important role in helping children adjust socially and emotionally, maintain psychological well-being, cope with stressful events, and build positive social relationships (Aune et al., 2023; Dalimunthe & Nasution, 2023; Hamaidi et al., 2021; McQuade & Breau, 2017; Qian et al., 2022; Stover et al., 2024). A meta-analysis by Stover et al. (2024) examined the association between cognitive reappraisal and resilience and found that greater use of adaptive emotion regulation strategies was associated with higher levels of personal resilience. This resilience enables typically developing siblings to adapt to difficulties, manage stress effectively, and recover more quickly from challenges, allowing them to learn and grow from setbacks. These findings reflected that adaptive emotion regulation

acts as a protective factor for typically developing siblings living in stressful environments. By strengthening emotion regulation skills, typically developing siblings are better able to regulate emotions, handle adversity, and reduce the negative impact of family and social stressors. Past studies by McQuade and Breau (2017), Dalimunthe and Nasution (2023), and Hamaidi et al. (2021) also showed that adaptive emotion regulation supports better socioemotional adjustment, encourages prosocial behaviour, and strengthens social competence, and these factors together improve socioemotional functioning in typically developing siblings.

Overall, these results highlight the protective role of strong emotion regulation skills in fostering typically developing siblings' healthy socioemotional development. Typically developing siblings who can regulate emotion effectively are more likely to adapt well in social situations, maintain positive relationships, and keep their emotions stable even during conflict or difficult circumstances.

The multiple linear regression analysis in the current study identified paternal permissive parenting style and emotion regulation as significant predictors of socioemotional functioning among the typically developing siblings of autistic children. This existing result resonates with prior research indicating that permissive parenting contributes to the deterioration of children's socioemotional outcomes (Agoha et al., 2021; Salavera et al., 2022; Vasiou et al., 2023; Yang, 2024; Yao, 2023)

and stronger emotion regulation skills are linked to better socioemotional outcomes (Mokoena & Kern, 2022; Petalas et al., 2012).

Although the explained variance ($R^2 = 0.146$) was modest, this magnitude aligns with findings in the broader psychological literature, where small but reliable effects are common for complex psychosocial outcomes. Findings from Funder and Ozer (2019) and Götz et al. (2022) also indicated that even modest effects can hold substantive significance when they represent cumulative or multilevel influences. Given its multifaceted nature, socioemotional functioning among Malaysian typically developing siblings is also likely further shaped by contextual factors such as parenting stress, sibling relationship quality, social stigma, collectivist family expectations, and teacher or peer support within school environments.

According to a review study on parenting experiences in Malaysia by Masiran (2022), parenting styles that align with cultural norms are considered more effective. The result that paternal permissive parenting predicted weaker socioemotional functioning among typically developing siblings reflects the centrality of family hierarchy and responsibility within Malaysia's collectivist culture. In this context, children are socialised to value obedience, interdependence, and harmony over personal autonomy. Fathers are traditionally viewed as moral guides and disciplinarians. In this context, permissive paternal behaviour is perceived as a lack of

leadership or direction, which contributes to emotional insecurity among siblings and thereby undermines emotional well-being and hinders the acquisition of essential social skills (Yang, 2024; Yao, 2023). Consequently, typically developing siblings developed lower social competence because they struggled to navigate social situations effectively (Salavera et al., 2022; Vasiou et al., 2023). A permissive approach from fathers can heighten feelings of neglect or create confusion about family roles, particularly when typically developing siblings feel that parental attention or support is unevenly distributed between them and their autistic sibling (Gorjy et al., 2017; Mandleco & Webb, 2015; Mokoena & Kern, 2022; Tsai et al., 2018).

According to Lucas-Molina et al. (2020), children with well-developed emotion regulation tend to demonstrate stronger social competence and are more likely to engage in prosocial behaviour. For typically developing siblings, effective emotion regulation can improve their ability to navigate social situations, build acceptance, and form positive peer relationships. This is an essential skill for typically developing siblings given the unique family and social challenges they are facing (Flenik et al., 2023; Gorjy et al., 2017; Schmeer et al., 2021; Tsai et al., 2018; Watson et al., 2021).

Furthermore, healthy emotion regulation enables typically developing siblings to develop adaptive coping strategies for managing stress and emotional strain, including feelings of anger, sadness, or concern related to their autistic sibling's

needs. Typically developing siblings with stronger emotion regulation skills are more capable of handling these emotions in a constructive manner, which in turn lowers the likelihood of internalising difficulties such as anxiety and depression (Lucas-Molina et al., 2020; Wilms et al., 2020). In addition, effective emotion regulation promotes empathy, allowing typically developing siblings to better recognise and respond to the emotions of their autistic siblings and parents. This capacity for empathy is important for sustaining socioemotional stability and fostering supportive relationships within the family (Lucas-Molina et al., 2020; Salavera et al., 2022).

The current findings highlight the substantial influence of both paternal permissive parenting and emotion regulation on the socioemotional functioning of typically developing siblings. To strengthen the socioemotional well-being of typically developing siblings, context-specific programmes should be integrated into Malaysian school and community systems. Schools could implement peer-support or sibling-awareness groups led by counsellors to promote emotion regulation skills and social inclusion. At the community level, family-based workshops organised through NGOs, autism centres, or religious institutions could help parents and siblings learn effective coping and communication strategies. These initiatives would align with Malaysia's collectivist values of mutual care and family harmony while providing accessible mental health support.

CONCLUSION

This study examined how parenting styles and emotion regulation influence the socioemotional functioning of typically developing siblings of autistic children in Central Selangor, Malaysia. Results showed that paternal permissive parenting and emotion regulation significantly predicted socioemotional functioning. From the perspective of Malaysia's collectivist and guan-based culture, these findings suggest that structured parental involvement and emotional restraint are interpreted as care and responsibility, while excessive permissiveness may reduce children's sense of security. Although the explained variance was modest, the effects are meaningful given the complex, multifactorial nature of socioemotional development.

These results are also in line with Bronfenbrenner's Ecological Systems Theory (1979), which explains how a child's development is shaped by the systems around them, particularly the direct interactions with parents in the family environment. The findings show that the quality of parenting, especially the balance of support and structure, can have a lasting effect on a child's socioemotional health.

To support the socioemotional needs of typically developing siblings, targeted strategies should encourage fathers to take an active and guiding role in family life while also teaching children practical emotion regulation skills. Within Malaysia's collectivist and family-oriented context, integrating culturally responsive parenting practices with school-based social-emotional

learning and community awareness initiatives may collectively enhance familial cohesion and equip typically developing siblings to better navigate the emotional and relational challenges of living with an autistic sibling.

Research Limitation

The first limitation of this study is the cross-sectional design of the study, which captures data at a single point in time and thus limits the ability to understand how parenting styles, emotion regulation, and socioemotional functioning of typically developing siblings might change or develop over time as typically developing siblings grow older, family dynamics evolve, or the needs of their autistic sibling shift. This design does not allow for capturing developmental trajectories or long-term patterns. Another limitation is that the sample was restricted to schools in Central Selangor, one of Malaysia's most urbanised regions. This limits the generalisability to other states, especially rural or East Malaysian settings.

Future research should consider multi-informant, mixed methods or longitudinal research designs and incorporate broader ecological variables such as peer relationships, social support, school climate, and family socioeconomic conditions, which could further enrich the findings, offering deeper insights and a more comprehensive understanding of the multifaceted socioemotional development in the typically developing siblings' population. Besides, cross-state sampling across Peninsular and

East Malaysia would allow examination of cultural and regional variations. Future studies should also explore gender-based differences, as traditional gender norms in Malaysian families may shape how siblings express emotions, perceive parental control, and use emotion regulation strategies.

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Assessment of the Vocal Risk Screening for Choristers Scale

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ABSTRACT

Choral singing has grown rapidly across schools, communities, and universities, celebrated for its social and educational benefits. However, the increasing vocal demands associated with choir participation have raised concerns regarding singers' vocal health and the need for preventive approaches. This study aimed to develop and validate a new self-report instrument, the Vocal Risk Screening for Choristers Scale (VRS-CS), to facilitate accessible vocal health screening and promote early identification of voice-related risk factors among Chinese choristers. The VRS-CS was initially constructed based on five domains identified from existing literature: dietary habits, speaking habits, health-related conditions, choral rehearsal practices, and peer influence. A total of 306 choristers aged 12 to 24 years participated in the study. Internal consistency reliability was examined using Cronbach's alpha, and test-retest reliability was evaluated through the intraclass correlation coefficient (ICC) over a four-week interval. Construct validity was assessed using exploratory and confirmatory factor analyses (EFA and CFA). The results showed excellent internal consistency ($\alpha = 0.881$) and test-retest reliability (ICC = 0.986). Factor analyses confirmed a stable five-factor structure with satisfactory model fit indices ($\chi^2/df = 1.866$, RMSEA = 0.053, GFI = 0.916, CFI =

0.957). The findings provide strong psychometric evidence for the VRS-CS as a valid and reliable tool for evaluating behavioural, environmental, and health-associated risks to vocal well-being in choral settings. The scale offers practical value for educators, conductors, and clinicians in supporting early screening, promoting vocal health awareness, and fostering sustainable vocal practices among young choristers in China.

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INTRODUCTION

There is a significant rise in choral participation in the past two decades in China, making choirs to becoming an essential part of educational and social programmes (Chen et al., 2022; Zhu, 2024). However, this growing popularity has also drawn attention to the potential vocal health risks associated with choral performance, particularly vocal fatigue, vocal strain, and the occurrence of voice issues in amateur vocalists, the methods they resort to cope with the difficulties, are scarce (Levett & Pring, 2023; Meerschman et al., 2025). In China, studies have indicated that choristers and other professional voice users generally lack adequate training and awareness in voice care and the prevention of voice disorders (Xiao & Mazlan, 2024; Zhou et al., 2025). Research conducted both domestically and internationally suggests that amateur choristers typically receive limited systematic vocal training and instruction in vocal hygiene.

Vocal training alone appears insufficient in addressing a range of voice-related problems; it should be complemented with vocal hygiene education to enhance singers' understanding and awareness of vocal health management (Levett & Pring, 2023; Ma & Leung, 2021; Rosa & Behlau, 2017). Additionally, a scope review by Xiao and Mazlan (2024) found that empirically, studies assessing vocal health in China have been limited since 2020, suggesting that this is a timely period to draw greater attention to issues concerning vocal well-being and risk awareness among singers.

Early detection of voice problems is essential to prevent minor functional issues from progressing into chronic or irreversible vocal pathologies. In the context of choral singing, where vocal demands are frequent and sustained, timely identification of potential risks enables targeted preventive and educational interventions. Such proactive measures not only reduce the incidence of vocal fatigue and injury but also promote long-term vocal sustainability and performance quality. Consequently, the need for reliable and contextually appropriate screening tools becomes critical to support singers' vocal well-being within educational and professional settings.

To facilitate easy access to vocal health screening and promote early identification of potential voice-related risks, this study first developed the Vocal Risk Screening for Choristers Scale (VRS-CS) and subsequently examined its reliability and validity. The instrument was designed to assess behavioural, environmental, and health-associated factors that may compromise the vocal well-being of choristers in China. By establishing its psychometric properties, this study contributes a reliable and contextually relevant tool to support healthy and sustainable choral participation in the Chinese context.

LITERATURE REVIEW

Voice disorders have been an area of growing concern as a public health problem for both professional and amateur users of the human voice. Many authors have observed that some of the shared manifestations

among choristers include voices that may be tired, hoarse, or painful, depending on factors such as poor use of the voice or unfavourable performance conditions (Levett & Pring, 2023; Meerschman et al., 2022). Rosa and Behlau (2017) observed that one in five amateur choristers suffered from persistent voice problems, particularly for female participants, in addition to vocally demanding professionals. Moreover, Ravall and Simberg (2020) found that 21% (n = 66) participants, attending an adult choir, presented functional vocal disorder. The study aimed at investigating the factors related to vocal health in cathedral choirs, and it was found that 58% of participants regularly experienced frequent voice symptoms, complaining of more than two regular vocal problems frequently after singing, including vocal tiredness, loss of upper range, hoarseness, pitch break, discomfort, and feeling dryness in the throat (Sharma et al., 2021). Importantly, a considerable number of participants never offered support for their vocal problems, without knowing whether amateur participation requires contacting professionals, and from whom (Levett & Pring, 2023).

China has seen a tremendous growth in choral endeavours, yet the training in choral vocal health has remained lagging. According to Zhu (2024), choral training in China emphasises collectivism and emphasises the improvement of musical knowledge and choral skills. Choral singing also requires its participants to sing in choral harmony; adjusting various sound elements,

such as timbre, pitch, and volume, in relation to the choral sound, can lead to simple vocal misuse (Kirsh et al., 2013; Meerschman et al., 2025). Zhou et al. (2025) also carried out a huge study, where 920 participants from various vocally demanding vocations in China were identified, asserting that there was a lack of knowledge and discrepancies in choral hygiene. The study proposed better integration and collaboration with health professionals through educational efforts for improved choral health.

Several proven self-administered questionnaires exist to evaluate vocal health and the perceived handicap imposed by it. The Voice Handicap Index (VHI) and its shortened form, the VHI-10, are well-known, reliable, and highly valid instruments used in practice (Rosen et al., 2004). Of more relevance to singers is the Singing Voice Handicap Index-36 (SVHI-36) that will examine the significance of impaired voices when it comes to actual singing (Cohen et al., 2007). The use, however, remains to evaluate subjectively the perceived handicap posed by the voice, rather than a potential health hazard that could arise from choir singing.

Conceptual Framework

The conceptual framework for this study, as illustrated in figure 1, has categorised the two types of independent variables, choral rehearsals and individual factors, that can affect the dependent variable, vocal wellness. The framework reflects the multidimensional concept that different factors could contribute to the problems that

child choristers experience when it comes to their voices.

The domain Choral Rehearsals comprises factors such as environmental factors, conductorial elements, and social factors. The factors were derived from research that emphasised how factors such as poor acoustics, background noise, poor air quality (Rantala et al., 2012), too much practice time, poor modelling, lack of vocal hygiene and vocal training (Niebudek-Bogusz et al., 2008; Thibeault et al., 2004), difficult song choices, and vocal competition (Freer, 2009; Smith & Sataloff, 2006; Tepe et al., 2009) can cause vocal problems.

The individual factors dimension covers physical and mental well-being, lifestyle habits, and speaking/singing habits. The underlying factors covered by the variables include hydration, amount and quality of sleep, eating habits, too much talking, mental stress, anxiety, reflux, and allergies

(Duffy & Hazlett, 2004; Morawska & Niebudek-Bogusz, 2017).

Current literature also identifies that novice choristers are also susceptible, particularly due to GBT, poor vocal practice, and ignorance of warm-down and warm-up methods. The practice of warm downs can often include outdated methods, or, in contrast, warm-ups can include cool-down routines that are regularly overlooked. Physical rehearsals (swaying, gestural singing, etc.) can improve vocal awareness, although acceptance by conductors depends on openness.

This model served as the basis for designing the Vocal Risk Screening for Choristers Scale (VRS-CS) to provide an understanding of how both group settings and individual behaviours contribute to vocal risk, facilitating the early detection and prevention methods for risk in a choir setting.

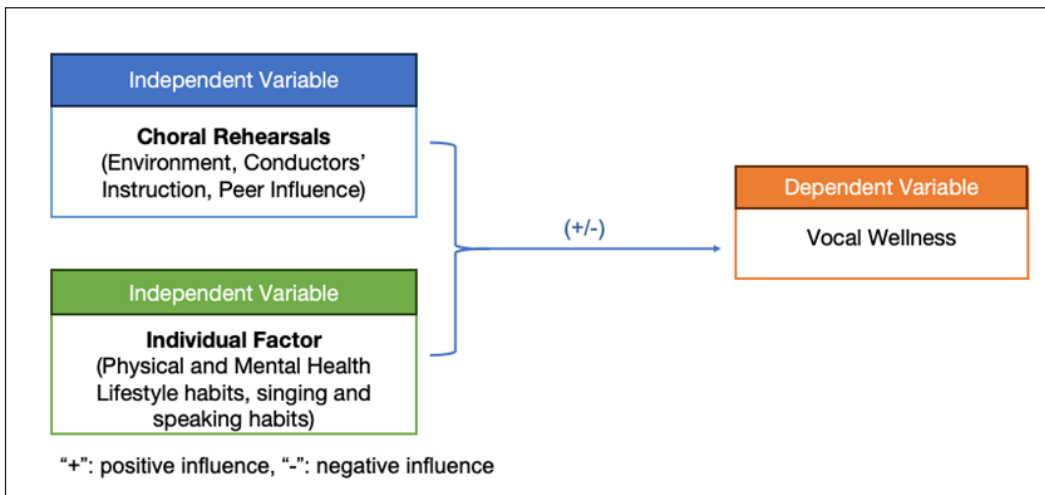


Figure 1. Conceptual framework of factors influencing vocal wellness in choirs

METHODOLOGY

The paradigm on which the research was based is that of positivism. This involved a focus on measurement and proof by statistics. This approach enabled the findings to be replicated to offer further evidence to support the use of the VRS-CS to determine the level of risk to which choristers were exposed based on vocal health.

The design applied in the research was quantitative, cross-sectional, and survey-based. The research utilised psychometric testing. The research methodology followed the standard procedure for testing an instrument as proposed by Hair et al. (2019). The procedure adopted in the research included three phases: the development of an instrument, pilot testing, and psychometric testing.

The research focussed on the validity and reliability of a self-assessment scale known as the Vocal Risk Screening for Choristers Scale (VRS-CS), which was used to determine the factors that influence the vulnerability of choristers' voices. The scale was designed to define the phenomenon of voices at risk within the choral setting. Factors that pose risks to voices were considered, including those related to behaviour and environment. The study particularly focussed on the design of the scale as being suitable for both adolescent and undergraduate choristers.

Participants

The sample was selected in 17 provinces in China, and the sample was to include individuals whose location was in diverse

parts of China, which are representative of the expanding choral movement in China. Applying the definition provided by the World Health Organisation (2021), it was possible to define the participants as individuals between the ages of 12 and 24, as individuals of this age group are more vulnerable to vocal health issues.

The research employed a voluntary response sampling method, where participants were given free will, and to make the research ethically appropriate, since the intention of the research was to gather responses of self-perceptions of the participants regarding their vocal health. The study adopted this methodology since it made it possible for choristers from various educational institutions to contribute, thereby facilitating voluntary, free participation by respondents, who also acted upon well-consulted, free, and well-informed choices. The applied procedure involved the sending of invitation emails that comprised study descriptions, informed consents and safe links to the email lists of the different choirs in 17 different provinces. The interested choirs then voluntarily took part by free choice of enrolling themselves through completing online questionnaires and thus ensured both autonomy and confidentiality. It collected 306 responses, registering an 85% rate. The population sample of interest was made up of 105 males (34.3%), and 201 females (65.7%), who were recruited in educational institutions of secondary and university, from Shanxi, Guangxi, Guangdong, Henan, Jiangxi, Shandong, Hebei, Hunan, Chongqing,

Jiangsu, Anhui, Shaanxi, Hubei, Fujian, Yunnan, Zhejiang, and Liaoning provinces.

However, the final sample size adhered to the recommended criteria for performing factor analysis. This is because, according to Hair et al. (2010), a minimum of five and preferably ten times the number of variables is required, recommending that the scale consisting of 39 items could range from 195 to 390. Additionally, it was recommended by Hair et al. (2019) that for medium to higher communality values (values ≥ 0.50), a sample size of 300 would be sufficient for both exploratory and confirmatory factor analysis. The study's sample size was 306.

Instrument Development

The Vocal Risk Screening for Choristers Scale (VRS-CS) has a total of 39 items, assessing five factors, namely dietary habits, speaking habits, health-related conditions, choral rehearsals, and peer influence. In addition, it contains items that assess demographics and vocal health. The scale used by the instrument is a four-point scale, also called the Likert scale, wherein a total sum can range from 0 to 156, where the higher the sum, the greater the risk level for vocal health problems.

The conceptualisation and development process that aims to produce the VRS-CS was largely influenced by the study that has identified and mapped the existence of vocal risk factors for amateur choristers, which was conducted by Rosa and Behlau (2017) using a descriptive analysis technique via a customised form, whose purpose is to identify closed-ended responses related

to the profiles, health, and perception of vocal risk. Although it has limitations, since it is not a psychological scale, it is also important to note that the study by Rosa and Behlau (2017) has played a crucial role in the process that resulted in the narrowing down of the domain related to the vocal risk factors for amateur choristers via its descriptive analysis technique. The study strives to further broaden the scope from that highly valuable, albeit preliminary, foundation.

Additionally, items concerned with behaviour and environment, informed by recent literature, were added to enhance its relevance and accuracy. Thus, it can be concluded that it is the first standardised screening instrument that endeavours to objectively evaluate vocal risk for choristers, a first step introduced through the valuable study by Rosa and Behlau (2017).

Procedure

The process for developing and validating the VRS-CS has passed through three levels. All the professionals who have reviewed the VRS-CS have been a total of eight in the field of choral musicianship and vocal health. The VRS-CS items were analysed in terms of relevance, clarity, and applicability in choral-singing groups that were divided into adolescent and young adult groups. This has made it possible to revise wordings and make corrections on redundancies detected in the items.

The pilot study, which was conducted, entailed 29 adolescents between the ages of 13 and 15 years, whereas the purpose

of the study was to examine the clarity and understanding associated with each item. This was done through semi-structured interviews on ambiguities, and the cases were discussed towards attempts to enhance clarity and accuracy in connection with responses. The pilot study attempted to justify the fact that the instrument was appropriate and understandable to the participants.

After the refinement stage, the refined VRS-CS internet questionnaire was conducted on secondary educational and university choristers in China. In terms of determining its reliability, the questionnaire was given to the respondents who were required to give answers twice, with a four-week spacing of four weeks. Cronbach's alpha and Test-Retest tests were used to test the reliability. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used to test the construction, convergent, and discriminant validity tests to design a valid scale for estimating the risk of possible vocal health issues in choristers.

Data Analysis

The results were analysed using the IBM SPSS (Version 27.0) and AMOS (Version 26.0) software packages. Descriptive analysis is used to examine the demographics and responses of the study participants. The reliability, content validity, construct validity, convergent, and discriminant validity tests were used to assess the VRS-CS scale.

Reliability Assessment

Internal consistency was checked through Cronbach's alpha, for which values exceeding 0.70 were deemed acceptable (Hair et al., 2010). The alpha value in the present study, that is, 0.85, reflected excellent internal reliability. The test-retest reliability was checked through intra-class correlation coefficients, for which values above 0.75 were deemed excellent (Cicchetti, 1994).

Content Validity

The content validity of the items was checked by administering them to eight choral conductors and voice therapists. The items were rated on a four-point scale, with 1 indicating not relevant and 4 indicating highly relevant. The item-level content validity index (I-CVI) was then determined by calculating the number of raters who responded with ratings 3 and 4, while the scale-level content validity index (S-CVI) was also assessed using both average (S-CVI/Ave) and universal (S-CVI/UA) methods. If the scale exceeds 0.78, then it attains strong content validity, and when using the average, it is greater than 0.80 (Polit & Beck, 2004).

Construct Validity

The construct validity was checked through EFA for unobserved factors and the extent to which VRS-CS has a sound structure. The Kaiser-Meyer-Olkin (KMO) value was greater than 0.60, and the result for Bartlett's

Test of Sphericity was significant at $p < .001$, thereby establishing that the data were suitable for factor analysis (Hair et al., 2010). The EFA, using PCA with Direct Oblimin rotation, resulted in a simple structure for factors related to the dimensions, thereby having construct validity.

Convergent Validity

To establish the convergent validity, confirmatory factor analysis (CFA) was used. The standardised factor loadings for each construct were well above 0.50, and the average variance extracted for each factor was greater than 0.50, ensuring convergent validity. The values for the different constructs' composite reliability were also greater than 0.70, ensuring the reliability and internal consistency of the constructs. The confirmatory factor analysis also checked that the model fitness values satisfied the recommended level for model fitness, given by Hu & Bentler (1999), and Browne and Cudeck (1992) for RMSEA < 0.08 , RMR < 0.05 , GFI values greater than 0.90, and Chi-Squared to Degrees of Freedom, respectively.

Discriminant Validity

The first method used to establish the discriminant validity was by comparing the average variance extracted (AVE) for each factor and the squared correlations (r^2) between factors, using the cut-off recommended by Fornell and Larcker (1981). The second procedure involved using a series of independent samples t-tests to examine the average scores for VRS-CS for choristers both with and

without perceived voice handicap, using the suggestion proposed by Hair et al. (2010). Significance in each t-test would indicate that the instrument can discriminate well between theoretically different groups.

RESULTS

The demographic characteristics of study participants are presented in Table 1. The three stages of adolescence include early adolescence (between the ages of 10-13 years), middle adolescence (between the ages of 14-17 years), and late adolescence (between the ages of 18-21 and beyond). Each stage covers the different growth and developmental stages that can produce distinctive changes in the participants' vulnerability to voice problems (Allen & Waterman, 2024). Thus, participants were randomly categorised according to the study objectives, composing two groups: first, participants aged 12-17 years, totalling 181 participants (59.2%), and second, participants aged 18-24 years, totalling 125 participants (40.8%). The participants were aged 12 to 24 years, having a mean age of 16.85 years ($SD = 3.21$).

The study involved 306 participants, with 105 males (34.3%) and 201 females (65.7%). Of the 360 students contacted by email, 306 (85%) agreed to participate in the study. Concerning the participants' choir experience, 180 (58.8%) were choir members for less than a year, 76 (24.8%) for one to two years, 40 (13.1%) for three to four years, and 10 (3.3%) for more than four years. The majority, 51.3% ($n = 157$) of the respondents, were previously vocally trained.

Table 1
Demographics and characteristics

Sample characterisation			
(n = 306)		n	%
Gender	Male	105	34.3
	Female	201	65.7
Age	12-17	181	59.2
	18-24	125	40.8
Time in Choir (years)	Below 1	180	58.8
	1 - 2	76	24.8
	3 - 4	40	13.1
	Above 4	10	3.3
Vocal Training	Yes	157	51.3
	No	149	48.7
Singing Voice Handicap (MSVHI-10)	Yes	182	59.5
	No	124	40.5
Voice Part	Soprano	72	23.5
	Tenor	122	39.9
	Alto	69	22.5
	Bass	43	14.1

The participants were also grouped according to whether they felt that their voice suffered from a handicap, using the Mandarin Singing Voice Handicap Index-10 (Fu et al., 2022). Choristers without a voice handicap were 124 (40.5%), while the others, totalling 182 (59.5%), experienced a voice handicap. The distribution by vocal category for the choristers was as follows: soprano, 72 (23.5%); tenor, 122 (39.9%); alto, 69 (22.5%); and bass, 43 (14.1%).

Descriptive Statistics

The sample size of 306 participants produced a skewness value of 1.087 and a kurtosis value of 3.008. According to statistical guidelines, skewness values between -2 and +2 (Tabachnick & Fidell, 2007) and

kurtosis values between -7 and +7 (Byrne, 2010) indicated a normal distribution. These results suggested that the data were normally distributed.

Table 2 summarised the descriptive statistics for the VRS-CS, presenting mean scores, standard deviations, and p-values from independent-samples t-tests comparing adolescents (aged 12-17 years) and young adults (aged 18-24 years). Significant differences were found in 27 items, with 11 showing highly significant differences ($p < .001$). The total mean score for the VRS-CS-39 was 102.48 (SD = 17.00). For the VRS-CS-20, adolescents had a mean score of 24.79 (SD = 8.97), whereas young adults scored higher, with a mean of 28.58 (SD = 8.57). These differences were

Table 2
Descriptive statistics

Variable	Mean	SD	Sig. ^{1,2}	MD ^{1,2}	Variable	Mean	SD	Sig. ^{1,2}	MD ^{1,2}
Q1	2.76	0.967	0.003	-0.330	Q22	1.91	0.922	0.422	0.089
Q2	2.91	1.210	<0.001	-0.650	Q23	1.47	0.895	<0.001	-0.427
Q3	2.81	0.906	0.004	-0.301	Q24	1.58	0.979	0.001	-0.388
Q4	2.98	0.928	0.017	-0.258	Q25	2.03	1.011	<0.001	-0.391
Q5	2.29	0.882	<0.001	-0.414	Q26	2.44	1.192	<0.001	-0.517
Q6	3.12	1.017	0.053	0.223	Q27	3.55	1.225	<0.001	0.915
Q7	3.50	0.979	0.002	0.358	Q28	2.89	1.294	0.021	0.348
Q8	3.38	0.999	0.019	0.268	Q29	2.12	0.964	0.002	-0.345
Q9	2.82	0.981	0.060	-0.215	Q30	3.74	1.112	0.071	-0.226
Q10	2.29	0.961	0.328	0.105	Q31	3.24	1.197	0.534	0.087
Q11	3.24	1.021	0.021	0.274	Q32	3.65	1.080	0.087	0.215
Q12	2.05	0.917	0.023	-0.242	Q33	3.47	1.215	0.053	0.274
Q13	2.31	0.929	0.187	-0.138	Q34	3.47	1.105	<0.001	0.504
Q14	2.53	1.075	<0.001	-0.520	Q35	3.60	1.130	0.101	0.211
Q15	2.35	1.156	0.014	-0.315	Q36	3.13	1.088	0.420	0.099
Q16	2.64	0.942	0.005	-0.297	Q37	2.17	0.961	0.117	-0.181
Q17	2.54	1.015	0.015	-0.287	Q38	1.77	0.933	0.008	-0.287
Q18	1.93	0.947	0.005	-0.305	Q39	2.04	0.957	0.038	-0.231
Q19	2.05	1.042	<0.001	-0.572	Total-39	102.477	17	0.028	-4.589
Q20	1.68	0.918	<0.001	-0.412	Total-20 ¹	24.79	8.971	<0.001	-3.794
Q21	1.77	0.941	<0.001	-0.549	Total-20 ²	28.58	8.565		

Note. SD= Standard Deviation, MD= Mean Difference, ¹= ages 12-17, ²= ages 18-24

statistically significant ($p = .028$ for VRS-CS-39; $p < .001$ for VRS-CS-20). Overall, young adults reported greater vocal risk than adolescents, suggesting that age-related factors may have influenced perceptions of vocal-health risk among choristers.

Cronbach's Alpha

The Cronbach's alpha reliability coefficient for the VRS-CS scale was $\alpha = 0.881$ ($N = 39$) (Table 3). This was beyond the acceptable level of ≥ 0.70 (Hair et al., 2010), proving

that the scale has almost perfect reliability for the measurement of its constructs.

Test-Retest Reliability

The test-retest reliability analysis, using the Intraclass Correlation Coefficient (ICC), gave a reliability coefficient of 0.986, while the 95% confidence interval for ICC was 0.982 to 0.989 (Table 4). This, according to Cicchetti (1994), showed significant excellence, since ICC values ranging from 0.75 to 1.00 indicate excellent reliability,

Table 3
Reliability statistics

Cronbach's Alpha	N of Items
0.881	39

Table 4
Intra-class correlation coefficient

	Intra-class Correlation ^b	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	0.972 ^a	0.965	0.978	70.585	305	305	0.000
Average Measures	0.986 ^c	0.982	0.989	70.585	305	305	0.000

Note. Two-way mixed effects model where people effects are random and measures effects are fixed

^a The estimator is the same, whether the interaction effect is present or not.

^b Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance.

^c This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

and it clearly indicated that the VRS-CS has outstanding stability and reliability.

Content Validity

The content validity test was carried out using a pool of eight experts from choral music and vocal health. The experts rated each item for clarity, relevance, and comprehension to determine its adequacy for use by choristers. The average scale-level content validity index (S-CVI/Ave) for the items from the expert judgement scores was 0.98, using the I-CVI, while the scale-level universal agreement index (S-CVI/UA) was 0.87 (Table 5). This scale was beyond the acceptable level for both I-CVI ≥ 0.78 and S-CVI ≥ 0.80 , offering

conclusive evidence on the scale's content validity (Polit & Beck, 2004).

Construct Validity

The correlation matrix gave an initial interpretation for the factor analysis process (Table 6). Values that exceeded 0.30 offered valuable associations, while correlations exceeding 0.50 offered significance from the perspectives of practice (Hair et al., 2010). Those that were lower than 0.30 were discarded for better clarity and significance during the process. Variables that offered strong correlations include 1 and 3 ($r = 0.668$), 1 and 4 ($r = 0.558$), and 3 and 4 ($r = 0.686$) for items that could fall under one category, while others were presented in Table 6.

Table 5
Content validity statistics

Sum of I-CVI	38.375	Sum of UA	34
S-CVI Average (Sum of I-CVI/No.of items)	0.98	S-CVI Relevance (Sum of UA/No. of items)	0.87

Table 6
Correlation Matrix^a

Hypothetic Factor 1					Hypothetic Factor 5			
Variable	1	2	3	4	37	38	39	
1	1				37	1		
2	0.411	1			38	0.592	1	
3	0.668	0.490	1		39	0.538	0.649	
4	0.558	0.471	0.686	1				

Hypothetic Factor 2			
Variable	10	12	13
10	1		
12	0.549	1	
13	0.588	0.548	1

Hypothetic Factor 3						
Variable	18	19	20	21	23	24
18	1					
19	0.694	1				
20	0.378	0.464	1			
21	0.446	0.552	0.613	1		
22	0.406	0.451	0.290	0.376		
23	0.475	0.504	0.480	0.540	1	
24	0.467	0.581	0.570	0.635	0.783	1

Hypothetic Factor 4						
Variable	30	31	32	33	35	36
30	1					
31	0.426	1				
32	0.611	0.615	1			
33	0.395	0.584	0.580	1		
34	0.405	0.567	0.588	0.760		
35	0.473	0.508	0.624	0.608	1	
36	0.427	0.450	0.483	0.457	0.605	1

Note Correlation is practically significant for highlighted values

To further investigate the dimensionality of the scale, an exploratory factor analysis (EFA) was carried out using Principal Component Analysis (PCA) and Direct Oblimin rotation. The dataset was found to fulfil the requirements for factor analysis, namely that it was suitable for factor analysis, reflected by the significance of Bartlett's test of sphericity ($p < .001$) and that the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (0.884) exceeded the recommended threshold level of 0.60 (Hair et al., 2010).

The exploratory factor analysis process produced 19 items that were removed for reasons related to the factors of cross-loading and low values, culminating in the derivation of a 20-item instrument for vocologist risk factors affecting singers. The final model based on Table 7 produced factors cumulatively explaining 69.80% of the total variance. The five factors based on the constructs of 'Dietary habits', 'Speaking habits', 'Health problems', 'Choral Rehearsal', and 'Peer Influence' were found to have sound construct validity since items fit correctly into the factors as seen in Table 8.

Factor 1 (dietary habits) included items regarding pre-bed eating and the consumption of fried and cold foods. Factor 2 (Speaking Habits) reflected items on yelling or talking too much when having a sore throat. Factor 3 (Health Issues) covered items related to allergies, upper respiratory tract infections, treatments for voice, and ENT visits. Factor 4 (Choral Rehearsal) included items related to the clarity of

direction by conductors, the delivery of vocal health education, and factors such as soundproofing and acoustic quality. Factor 5 (Peer Influence) dealt with items related to peer influences, such as noise, competition, and vocal misuse when singing in groups. These findings supported the five-factor model solution, construct validity, and the VRS-CS instrument in evaluating risk factors for voice problems for choristers.

Convergent Validity

Figure 2 showed the graphical display of the final confirmatory factor analysis (CFA) model. The model displayed strong standardised factor loadings and acceptable fit indices, ensuring that the proposed measurement model was appropriate. The output information related to this model is presented in Table 9.

Confirmatory factor analysis (CFA) using AMOS analysis software was conducted to test the overall model of the respondents' questionnaire in the research. The analysis produced a good model fit. The model fit indices satisfied a set of standards of $\chi^2/df = 1.866$, RMSEA = 0.053, GFI = 0.916, and CFI = 0.957. These values surpassed the acceptable cut off values set by Hu and Bentler (1999) and Browne and Cudeck (1992). Furthermore, high factor loadings above 0.50 were observed for all items. The average variance extracted in each construct also exceeded 0.50. The measurements indicated that the convergent validity of the research instrument was satisfactory, as it surpassed 0.50, as recommended by Hair et al. (2017). Furthermore, the measures of

Table 7
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.884
Bartlett's Test of Sphericity	Approx. Chi-Square	5795.444
	df	741
	Sig.	0.000

Table 8
Rotated factor Matrix^a

	Factor 1 Dietary Habits	Factor 2 Speaking Habits	Factor 3 Health Issues	Factor 4 Choral Rehearsal	Factor 5 Peer Influence
Q1	0.818				
Q3	0.880				
Q4	0.865				
Q10		-0.808			
Q12		-0.784			
Q13		-0.833			
Q20			0.845		
Q21			0.798		
Q23			0.718		
Q24			0.825		
Q30				0.684	
Q31				0.769	
Q32				0.828	
Q33				0.803	
Q34				0.825	
Q35				0.826	
Q36				0.705	
Q37					-0.774
Q38					-0.737
Q39					-0.681

Note. Extraction Method: Principal Component Analysis

Rotation Method: Oblimin with Kaiser Normalisation

^aRotation converged in 9 iterations

Table 9
Reliability and convergent validity

Variables/ Constructs	Items	Standardised Factor Loadings	Cronbach α	Composite Reliability	Average Variance Extracted	Maximum Shared Variance
Dietary Habits	Q1	0.749	0.863	0.845	0.647	0.245
	Q3	0.891				
	Q4	0.765				

Table 9 (continued)

Variables/ Constructs	Items	Standardised Factor Loadings	Cronbach α	Composite Reliability	Average Variance Extracted	Maximum Shared Variance
Speaking Habits	Q10	0.759	0.842	0.794	0.562	0.314
	Q12	0.726				
	Q13	0.764				
Health Issues	Q20	0.657	0.852	0.877	0.643	0.438
	Q21	0.759				
	Q23	0.918				
	Q24	0.850				
Choral Rehearsal	Q30	0.640	0.903	0.888	0.534	0.010
	Q31	0.695				
	Q32	0.800				
	Q33	0.742				
	Q34	0.794				
	Q35	0.788				
	Q36	0.634				
Peer Influence	Q37	0.690	0.836	0.816	0.597	0.438
	Q38	0.842				
	Q39	0.779				

Note. Model Fitness: $X^2 = 285.563$, $df = 153$, $X^2/df = 1.866$, RMSEA = 0.053, RMR = 0.056, GFI = 0.916, CFI = 0.957

the total shared variance for each construct were lower than the measures of average variance extracted. This finding confirmed that the overall model had captured a distinct concept. The Cronbach alpha statistics and values for each dimension exceeded 0.70, confirming that the research instrument was reliable, as the internal consistency surpassed 0.70.

Discriminant Validity

The analysis used the Fornell and Larcker (1981) criterion to evaluate the measurement instrument for its discriminant validity. The instrument was evaluated to determine if each dimension captured a unique concept by estimating the square roots of

average variance extracted (AVE) for each dimension, then comparing them to the correlations amongst constructs. The square roots of average variance extracted for each dimension were presented diagonally in bold (Table 10), while inter-construct correlations were presented in other cells. To establish construct discriminant validity, each element in the diagonal cells needed to exceed the correlations in the corresponding cells. This study met the requirements, thereby confirming that each dimension is unique without overlapping.

To establish how widespread perceived voice handicap is, participants were divided equally along their scores on the Mandarin version of the Singing Voice Handicap

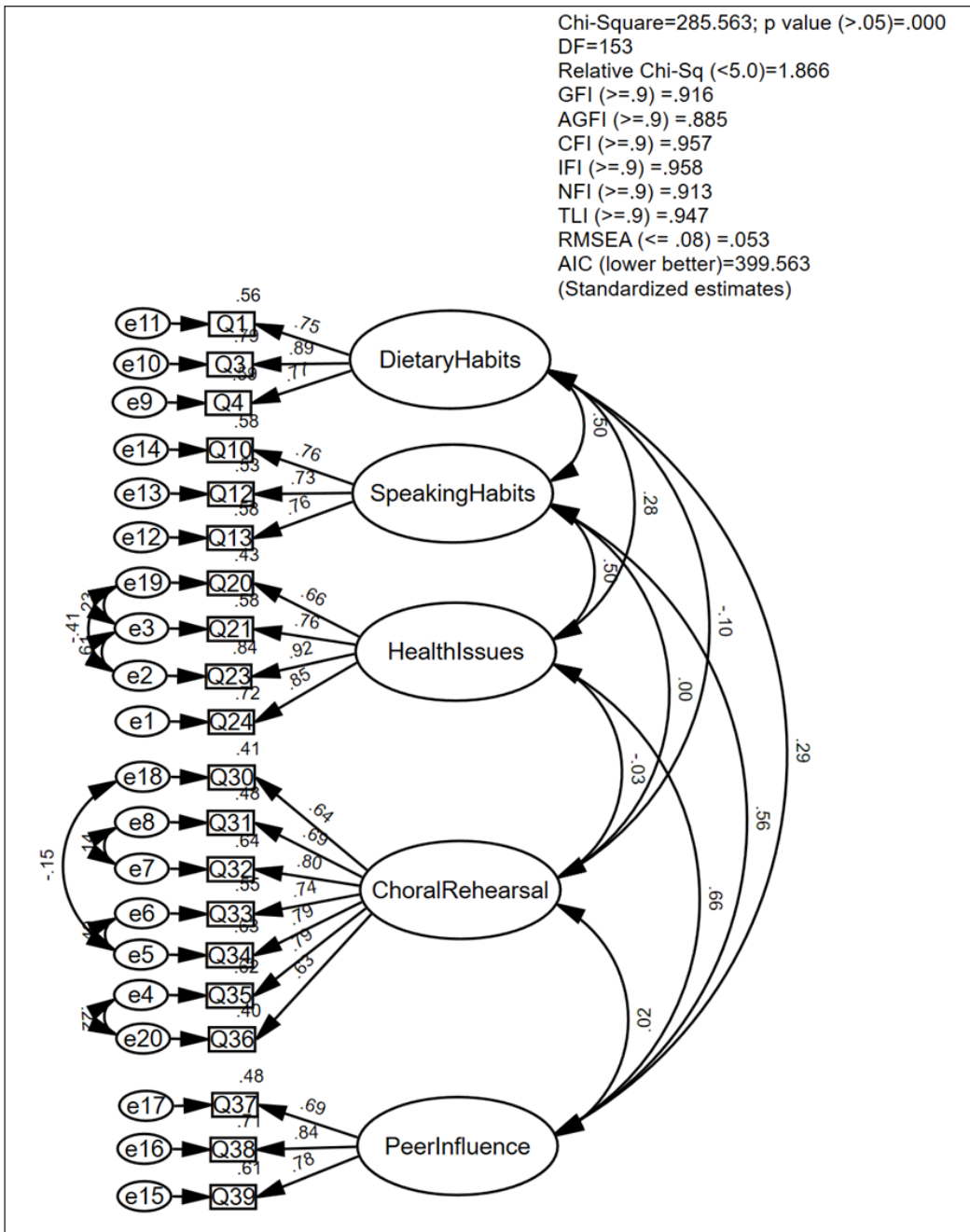


Figure 2. CFA Model

Table 10
Discriminant validity

	Speaking Habits	Health Issues	Choral Rehearsal	Dietary Habits	Peer Influence
Speaking Habits	0.750				
Health Issues	0.504	0.802			
Choral Rehearsal	0.002	-0.028	0.731		
Dietary Habits	0.495	0.281	-0.102	0.804	
Peer Influence	0.560	0.662	0.025	0.292	0.773

Table 11
VRS-CS-20 mean scores for Choristers with and without voice problems

	N	Minimum	Maximum	Mean	Std. Deviation	Sig. (2-tailed)
With Voice Handicap	182	15	53	30.46	7.80	
Without Voice Handicap	124	8	47	20.29	6.99	<0.001

Index-10 (Fu et al., 2022). The group without a voice handicap (NVH) was then contrasted with the group having a voice handicap (VH). The average scores for both groups were evaluated using the Vocal Risk Screening for Choristers Scale-20 (VRS-CS-20) (Table 11). The average score for the NVH group was 20.29 (SD = 6.99), contrasted with a significantly higher average score for the VH group, which was 30.46 (SD = 7.80) for the VRS-CS-20. The result from the independent samples t-test identified that the difference was significantly different at $p < 0.001$. The finding clearly identified that choral singers perceiving a voice handicap were at significantly greater risk than the group without problems. The results significantly

identified that the scores for the VRS-CS-20 clearly offered confirmatory support for the scale's use for discriminant validity.

DISCUSSION

This study resulted in the construction and validation of a scale called the VRS-CS that was multidimensional and helped identify various factors that contributed to the risk of vocal strain in choristers. The results clearly showed that the proposed scale had strong reliability and validity, along with outstanding stability. The creation of a structure comprising five factors, namely diet, speaking habits, health, practice habits, and social factors, helped clearly identify the risk for vocal strain, breaking it down from its multidimensional construct.

The robust performance of the VRS-CS from a psychological perspective clearly established the reliability and validity of the instrument's use for assessing the risk level for vocal health in choristers. The internal consistency reliability, reflected by Cronbach's alpha ($\alpha = 0.881$), clearly signified that the instrument accounted for a definite construct and that various underlying elements were related to each other, forming the domain of vocal behaviour, health, and environmental factors. The reliability on a test and retest basis also clearly signified that it had strong ICC (test-retest) reliability (ICC = 0.986). The factor analysis assumed considerable importance, as it clearly gave strong indications for evaluating the construct validity, and the model identified, consisting of five constructs, indicated a strong conceptual validity model.

The current study contributed to the existing literature by combining various predictors of vocal strain, that is, occupational voice load (Huston et al., 2023), noise level (Perry et al., 2023), and classroom air quality (Vertanen Greis et al., 2023), into a single validated instrument. The VRS-CS transcended existing symptom-oriented or profession-oriented assessments (Pestana et al., 2017) by embracing the interactions that existed at behavioural, biological, and social levels of vocal health, thereby supporting the philosophy advocated by Smith and Sataloff (2006) that choral pedagogy and vocal physiology need to be integrated for good vocal health to occur.

Some items were removed during the exploratory factor analysis, since the

loading factors suggested that there were low correlations for some items related to participants' experiences with vocal problems. This was carried out to improve the factor clarity and reliability of the scale. The items with low factor loadings could still affect vocal outcomes in different situations and populations. In the study, hydration, warm-ups, and eating spicy food were excluded. However, these variables could still be in an indirect relationship that could act either as a moderator or a mediator.

This view was also supported by existing literature, whereby unstructured warm-up exercises were found to contribute to, rather than improve, the subjective effort of vocalisation (Whitling et al., 2023). Thus, the effectiveness of the warm-ups seems to rely less on their implementation as part of the rehearsal schedule and more on how the warm-up activities are carried out and how well the activities meet the principles of voice hygiene. Inconclusive implementation of warm-up activities among the conductors of the choir groups can also account for the disparity, as the conductors can end up placing more emphasis on the musical preparation instead of the voice hygiene and physiologic readiness (Freer, 2022). Another perspective related to voice health indicated that specific and gradual warm-up activities emphasising appropriate support respiration and onset procedures can play a greater role in voice efficiency and prevention of voice fatigue than other factors (McAllen et al., 2025; Van Lierde et al., 2021).

While hydration, a crucial process that helps to maintain viscosity in mucous

tissues, also generally showed little relation to perceived vocal quality when examined through self-report analysis (Sivasankar & Leydon, 2010). Furthermore, Chowdhury et al. (2023) noted that improper eating behaviours, such as the excessive intake of high-fat foods, spicy foods, caffeinated beverages, and highly acidic foods and drinks, may trigger events that contribute to the exacerbation of reflux. This may consequently affect the tissues of the larynx and lead to laryngitis and vocal discomfort.

However, there were strong correlations observed to exist between vocal fatigue and poor practices of vocal hygiene, excessive duration of musical practice, poor acoustic conditions, and peer influence. The findings from the research were consistent with those of Meerschman et al. (2022), who observed that increased levels of vocal load and poor acoustic conditions had a strong association with increased phonation effort. Additionally, poor awareness of vocal hygiene practice remained a concern for amateur choristers and was often linked to the prevalence of vocal symptoms (Sharma et al., 2021). The findings confirmed that existing knowledge on the implications of negligence and environmental factors had more significance than preventive factors on the incidence of vocal fatigue.

Theoretically, the evidence that validated the VRS-CS showed that the multidimensional approach to the risk of vocal health encompassed the interactions of behaviour, environment, and physiology. The findings of the research confirmed that there was more to vocal health than

technique or hygiene-related concerns, and that vocal health could indeed be viewed as a systemically defined set of interactions among various psychological and environmental factors that contributed to an individual's level of vulnerability to the risk of vocal health, as observed by Stemple et al. (2018).

The VRS-CS proved to be an effective screening tool for teachers, clinicians, and researchers to identify early on various potential factors of vocal health. The VRS-CS showed high levels of both reliability and structural validity. As such, it appears to be an important screening instrument in choral educational settings, where systematic monitoring of vocal health has not occurred frequently. The scale could also provide direction for interventions, preventive vocal training, and a basis for evaluation in longitudinal studies concerned with strategies for vocal pedagogy, health, and rehearsals.

In conclusion, the VRS-CS not only provides a validated method of assessing the risk factors of voice handicap for young choral singers but also offers an important contribution towards the further advancement of vocal pedagogy. The comprehensive framework of VRS-CS that includes characteristics of both the Behavioural dimension, as well as the Environmental dimension and Health-related dimension, provides a valuable resource that not only helps early diagnosis of vocal risk but also helps develop strategies towards sustainable vocalisation.

Research Significance

The present study has made a major contribution to the areas of vocal pedagogy, choral education, and voice therapy. The concept of the Vocal Risk Screening for Choristers Scale (VRS-CS) outlined and verified through the study signifies more than a psychometric milestone, as it has established a framework for choral understanding that can promote healthy choral practice for young choristers on a sustainable level. The verification process for the scale has demonstrated that, for many years, choral research has lacked standardised measurement scales, and hence systematic study has not been possible in relation to the risk factors associated with healthy choral practice.

The relevance and significance of VRS-CS reside in the capacity of the study to integrate pedagogical, behavioural, and clinical paradigms. It attempted to offer a comprehensive theoretical foundation for vocal well-being on account of the capacity of the model to define the notion of vocal health risk based on the encounter that takes place at the levels of behaviours, physiology, and environment. The outstanding psychometric qualities of VRS-CS offer an important indication that it possesses stability and thus the capacity of the research to act as a benchmark for future comparison. In addition to the methodological aspect of the research, it also contributes to the emerging literature that proposes a preventive approach in relation to voice care. The significance of risk analysis towards vocal health not only

includes the aspect of consequences of voice misuse and strain, but also the perspective of searching for patterns within educational contexts.

Research Limitations

However, there are certain limitations that need to be understood when analysing the outcomes derived from this research. The first limitation is the use of self-reporting, whereby the study could be prone to certain types of bias, such as social desirability, accuracy of recall, and so forth, and individuals may have responded to the study questions in accordance with expected behaviour related to their vocal use patterns.

Second, the study did not use objective clinical measurements, for example, laryngoscopy, to confirm the participants' vocal fold health. The results, therefore, were based on perceived rather than objectively validated vocal health conditions.

Third, while the participants came from 17 provinces across mainland China, the study population was limited by its participants' age range, consisting only of adolescents and young vocalists from secondary educational institutions and universities. Despite its well-defined demographics, the results do not apply to populations different from the original study group, not only in geography, culture, and language, but also in learning settings and health services.

Finally, the analysis employed a cross-sectional study design, which made it rather difficult to establish whether causal links existed among the various identified factors.

For instance, long-term research designs should be used to determine the influence of factors such as behavioural, environmental, and physiological variables that affect the vocal outcomes of choristers.

CONCLUSION

The reliability and validity of the VRS-CS were assessed critically within the research. The findings provide evidence of the usefulness of the VRS-CS as a valid scale used in evaluating contributory factors that influence voice difficulties in choristers. The reliability and validity indices were found to produce highly significant results, making the VRS-CS scale highly dependable for use in research, educational, and professional settings. Collectively, it can be agreed that the results form a solid basis for future research and health efforts by concerned parties to protect and improve the vocal well-being of choristers.

Ethical Considerations

The study protocol was reviewed and approved by the Ethics Committee of Universiti Putra Malaysia (JKEUPM). All research procedures complied with the institutional ethical standards for studies involving human participants.

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APPENDIX

Validation format for data collection instruments

Title of the instrument for validation: “The Vocal Risk Screening for Choristers Scale (VRS-CS-39) Questionnaire among Chinese Younger Choristers”

Dear Experts,

We beseech your expert opinion in how relevant each item is being measured. The instructions are provided below to guide you in your analysis. Please use the following rating scale and rate each item as objective as possible in your review.

Instruction: This instrument is used for the EXPERT EVALUATOR to assess the relevance and effectiveness of the instrument that is validating. You must place the punctuation that you consider appropriate to the different statements according to the following scale:

1. Not Relevant 2. Somewhat Relevant 3. Quite Relevant 4. High Relevant

Questionnaire Item The Vocal Risk Screening for Choristers Scale (VRS-CS)	Scale			
	1 (Not Relevant)	2 (Somewhat Relevant)	3 (Quite Relevant)	4 (High Relevant)
Have you had formal musical training before? If yes, how long? 你之前有接受过多久的专业声乐训练?				
How long have you participated in choral singing? 你参加合唱团的日常排练共多久?				
Which part do you sing? 你在合唱团中担任的声部是?				
1. I would like to eat within three hours before bedtime. 我会在睡觉前三小时吃东西。				
2. I prefer to eat spicy food. 我喜欢吃辣的食物。				
3. I prefer to eat oil food. 我喜欢吃油炸食品。				
4. I prefer to eat ice cream or have cold drinks. 我喜欢吃冰激淋或喝冰饮料。				
5. I prefer to eat too hot food or drink hot water or soup. 我常吃很热的食物或者喝烫水。				
6. I can drink at least 1000-1500mL of water every day. 我每天至少能保证摄入1000-1500mL的水。				
7. I can sleep well at night. 我的睡眠质量很好。				
8. I usually have excessive talking every day. 我每天会说很多的话。				
9. I usually clear throat or cough. 我会经常清嗓子或者咳嗽。				
10. I usually scream, yell or holler. 我会尖叫或者大声吼叫。				

11. I usually whisper. 我会窃窃私语或者小声哼歌。				
12. I have to talk during throat infection. 嗓子发炎期间我不得不讲很多话。				
13. I have to talk in noise situations. 我不得不在很吵闹的环境下讲话。				
14. I have poor postures when speaking or singing (Hunched back). 当我说话或者歌唱的时候, 我的体态不好。(比如: 低头, 含胸, 驼背, 坐着唱)				
15. I usually sing without warming up. 我在歌唱前没有进行开嗓练习。				
16. I am out of break when singing. 唱歌时我的气息总是不够。				
17. I do not experience emotional stress or frequent feelings of sadness and depression. 我没有情绪上的压力或时常感到沮丧和抑郁。				
18. I have experienced acid reflux (The backflow of stomach contents, including acid, into the throat or mouth, causing a sour or bitter taste). 我有经历过胃酸返流(胃内容物(胃酸)回流到喉咙或口腔中, 导致酸味或苦味)。				
19. I have heart burn (A burning sensation in the chest, often after eating or when lying down). 我有经历过烧心或者消化不良(胸部烧灼感, 通常在进食后或躺下时出现)。				
20. I have nasal/inhalant allergies. 我有鼻炎或者吸入式的过敏症状。				
21. I have upper respiratory tract infection (URTI). 我经历过上呼吸道感染。				
22. I have the flu or a cold. 我患了流感或感冒。				
23. I have some voice treatments. 我接受过一些嗓音的治疗。				
24. I have consulted an ENT (ear, nose and throat) specialist. 我有去寻求过耳鼻喉科医生的帮助。				
25. I usually have practiced singing each day more than 2 hours except choral rehearsals. 我每天练歌超过两小时。				
26. I have participated in choral rehearsals for more than 2 hours every time. 我每次在合唱团的排练时间超过两个小时。				
27. Perform vocal warm up at the beginning of choral singing. 在合唱团排练时, 会先进行集体练声。				
28. Perform cool down at the end of choral singing. 在合唱团排练结束时, 会进行声音的放松训练。				
29. I feel difficult about selected repertoires. 感觉合唱团排练的曲目超出了我的歌唱水平。				
30. Choral conductors can clearly instruct the choral rehearsal. 我可以清晰的明白和理解合唱指挥的指示。				

31. Choral conductors have mentioned vocal hygiene during rehearsals. 合唱指挥有普及过声音健康方面的常识。				
32. I can get useful vocal techniques during choral rehearsals. 在合唱排练期间，我能够学到有效的发声技巧。				
33. The rehearsal room has soundproofing to prevent external noise from interfering with rehearsals. 排练厅有隔音设备能有效防止外部的噪音干扰。				
34. The rehearsal room is dusty. 排练厅布满灰尘。				
35. I have enough time to take a rest after the rehearsal. 我有充足的时间去休息自己的嗓子。				
36. I usually feel that my voice quality is good. 我觉得自己的声音质量很好。				
37. I am easily disturbed by other choristers when I am singing. 在合唱过程中，我容易受到其他合唱团员的干扰。				
38. I would like to compete with other choristers during choral rehearsals. 排练过程中，我喜欢和其他合唱团员相互竞争（比如飙高音）。				
39. I usually overuse my voice during choral singing with peers. 和同伴一起合唱时，总会不可避免的过度用嗓。				

Please write out the **risk factors** that were not mentioned and **comments**:

请写出上面没有提到过的风险因素和意见：

Name: _____

APPENDIX

The Vocal Risk Screening for Choristers Scale (VRS-CS-20)

The following statements are used by many people to describe their vocal habits, lifestyle, and other external factors that may affect vocal health. Over the past THREE months, based on your actual situation, please check the frequency of the following circumstances by marking the appropriate response.

下列的叙述是许多人用来描述他们的用嗓习惯，生活方式以及其他外部可能会影响声音健康的因素，在过去的三个月内，根据您自身的真实情况，请选出以下情况的频繁程度。

1=Never从不 2=Occasionally偶尔 3=Sometimes有时 4=Often经常 5=Always总是

How many years of professional vocal training have you received? (years) 你接受过多久的专业声乐训练？（单位：年）					
How long have you been a member of the choir? (years) 你加入合唱团多久了？（单位：年）					
What vocal part do you sing in the choir 你在合唱团中担任的声部是：	Soprano 女高音	Alto 女中音	Tenor 男高音	Bass 男低音	
Risk Factors 风险因素	Frequency 频繁程度				
	1. Never 从不	2. Occasionally 偶尔	3. Sometimes 偶尔	4. Often 经常	5. Always 总是
Q1. I would like to eat within three hours before bedtime. 我会在睡觉前三小时吃东西。	1	2	3	4	5
Q3. I enjoy fried food. 我喜欢吃油炸食品。	1	2	3	4	5
Q4. I like to eat ice cream or drink cold beverages. 我喜欢吃冰激淋或喝冰饮料。	1	2	3	4	5
Q10. I usually scream, yell, or holler. 我会尖叫或者大声吼叫。	1	2	3	4	5
Q12. I have to talk a lot when my throat is inflamed. 嗓子发炎期间我不得不讲很多话。	1	2	3	4	5
Q13. I have to speak in very noisy environments. 我不得不在很吵闹的环境下讲话。	1	2	3	4	5
Q20. I have nasal/inhalant allergies. 我有鼻炎或者吸入式的过敏症状。	1	2	3	4	5
Q21. I have upper respiratory tract infection (URTI). 我经历过上呼吸道感染。	1	2	3	4	5
Q23. I have some voice treatments. 我接受过一些嗓音的治疗。	1	2	3	4	5

Q24. I have consulted an ENT (ear, nose and throat) specialist. 我有去寻求过耳鼻喉科医生的帮助。	1	2	3	4	5
Q30. Choral conductors can clearly instruct the choral rehearsal. 我可以清晰的明白和理解合唱指挥的指示。	1	2	3	4	5
Q31. Choral conductors have mentioned vocal hygiene during rehearsals. 合唱指挥有普及过声音健康方面的常识。	1	2	3	4	5
Q32. I can get useful vocal techniques during choral rehearsals. 在合唱排练期间，我能够学到有效的发声技巧。	1	2	3	4	5
Q33. The rehearsal room has soundproofing to prevent external noise from interfering with rehearsals. 排练厅有隔音设备能有效防止外部的噪音干扰。	1	2	3	4	5
Q34. The rehearsal room is dusty. 排练厅布满灰尘。	1	2	3	4	5
Q35. I have enough time to take a rest after the rehearsal. 我有充足的时间去休息自己的嗓子。	1	2	3	4	5
Q36. I usually feel that my voice quality is good. 我觉得自己的声音质量很好。	1	2	3	4	5
Q37. I am easily disturbed by other choristers when I am singing. 在合唱过程中，我容易受到其他合唱团员的干扰。	1	2	3	4	5
Q38. I would like to compete with other choristers during choral rehearsals. 排练过程中，我喜欢和其他合唱团员相互竞争（比如飙高音）。	1	2	3	4	5
Q39. I usually overuse my voice during choral singing with peers. 在和同伴一起合唱时，总会不可避免的过度用嗓。	1	2	3	4	5

The Influence Loop: How Perceived Norms Drive Academic Librarians' Use and Advocacy of Generative AI for Information-seeking

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ABSTRACT

Although generative AI tools are becoming increasingly popular in the workplace, owing partly to the belief that they can boost efficiency and productivity, empirical evidence is limited on the norms that drive actual usage and advocacy behaviour among academic librarians, particularly in developing countries. The current study aims to determine the influence of two types of perceived norms (injunctive norms and descriptive norms) on academic librarians' generative AI use and advocacy behaviours while examining the mediating role of behavioural intention and the role of digital information-seeking skills. This study applies the integrated behavioural model to correlational research among academic librarians in three Federal Universities in South-Western Nigeria. A sample of 133 participants was selected using simple random sampling, and responses were obtained using a self-report questionnaire. Partial Least Squares structural equation modelling validated the research model. Results suggest that injunctive norms and information-seeking skills directly influence Generative AI use and advocacy behaviours. Descriptive norms directly influence use behaviour, but not advocacy behaviour and behavioural intention mediates the relationship between injunctive norms and generative AI use behaviour. The Findings have implications for learning and technology adoption among library and information science practitioners, particularly for improving skills through targeted training programmes and social interaction in the workplace. The study offers insights into the potential of Generative AI for information discovery, advocacy, and service delivery by academic librarians in a non-Western context, and provides valuable evidence relevant to policymaking, training, and development.

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INTRODUCTION

Information literacy constitutes individuals' personal, social, and ethical skills when interacting with information (Boon et al., 2007). It encompasses a wide range of knowledge, skills, and actual behaviours related to localisation, evaluation, and efficient use of information (Timmers & Glas, 2010). Within higher education, effective information literacy is necessary for critical thinking, information management, cross-disciplinary collaboration, and effective environmental adaptation among academic staff and students (Bhimani, 2011; Lauri & Virkus, 2019; White & Wood, 2021). Professional academic staff, like librarians, are mediators of information literacy as they are responsible for developing and teaching information literacy programmes for library users. Many librarians report that this makes their work more meaningful and highly engaging. It provides opportunities for collaboration with faculty while building a sense of community on and off campus (Tewell, 2018; Yevelson-Shorsher & Bronstein, 2018).

Effective information literacy begins with individuals seeing the need for information, gaining access to resources and developing skills for information-seeking (Bhimani, 2011). For centuries, libraries have been the primary location for achieving these. For instance, libraries provide reliable access to curated resources and expert assistance, and in many advanced countries, public libraries are essential locations for education and literacy (Sin & Kim, 2008; Whiteman et al., 2018). Librarians guide

library users in the cognitive, investigative and ethical processes of information-seeking (Smith & Dailey, 2013). When public librarians in Demasson et al. (2019) were asked what information literacy entails, they stated that it requires an intellectual process and technical, social, and navigation skills to achieve desired results. This suggests that information-seeking among librarians is at the core of information literacy, as their job is a goal-oriented process that requires cognitive and practical skills and an adequate contextual understanding.

Despite their relevance to information discovery and delivery, librarians face challenges that limit the effectiveness of their practice. For instance, librarians are expected to follow professional norms and meet high client and institutional expectations ranging from the basic location of physical library resources to teaching critical information literacy and navigating many different complex technologies and web services (Tewell, 2018; Vitak et al., 2018); library staff often report having average levels of work engagement and high levels of workload imbalance (Martin, 2020); librarians who are in the process of becoming teachers lack pedagogical knowledge (Austin & Bhandol, 2013); and librarians whose promotion depends on research, complain that they lack time to conduct quality research (Donkor et al., 2024). In developing countries like Nigeria and South Africa, a substantial inadequacy in ICT knowledge and skills is evident among university librarians (Adeyoyin, 2005; Hoskins, 2005).

Separating information literacy from digital literacy in contemporary library service delivery is almost impossible. This is because of the recent breakthroughs in information discovery using generative artificial intelligence (Akakpo, 2024). Library staff in India express a positive attitude towards AI integration into library services, believing that it can enhance service delivery and that they are willing to understand its various uses and ethical implications (Kalbande et al., 2024a). Research indicates that Generative AI can help reduce library workers' workload by streamlining indexing and classification processes and extracting and composing descriptive metadata while enhancing consistency and accuracy (Formanek, 2024; Mahmud, 2024). AI-assisted chatbots can also facilitate personalised recommendations and specific support, and increase user satisfaction (Ikwuanusi et al., 2024).

Most importantly, generative AI offers tremendous opportunities for information retrieval (Y. Huang & J. Huang, 2024). This is particularly important for library staff dealing with clients' queries, whose work involves teaching and research or those interested in transitioning into teaching. A comprehensive list of generative AI tools useful for librarians can be found in (Gasparini & Kautonen 2023). The benefits of generative AI within libraries are not without costs. Research indicates that many academic libraries in the UK and China exclude AI integration from their strategic plans or agendas (Huang et al., 2023). For instance, AI integration and maintenance

may be expensive for libraries, particularly in developing countries plagued with inefficient internet access, digitalisation policies and funding (Adarkwah et al., 2024; Kalbande et al., 2024b); issues relating to privacy infringement, security and inequality in access to digital resources may impede AI integration (Kalbande et al., 2024b; Zeb et al., 2024); and as prevalent with new technology adoption, inadequate technical skills and training of library staff (Adeyoyin, 2005; Akakpo, 2024; Hoskins, 2005). However, as new technologies evolve, they generally become cheaper, more accessible, and more secure while policies guiding their ethical use are developed. Hence, to help library staff adapt to emerging technologies in information seeking, it is crucial to understand their current norms, intentions, usage behaviour, and advocacy.

Investigating the norms, skills, and intentions that drive generative AI use and advocacy behaviour for information seeking is expedient for library and information science practitioners, as they are the principal mediators in its integration within academic libraries. Although generative AI tools are becoming increasingly popular in the workplace, owing partly to the belief that they can boost efficiency and productivity, empirical evidence is limited on the norms that drive actual usage and advocacy behaviour among academic librarians, particularly in developing countries where libraries have insufficient access to fiscal and infrastructural resources, and where digital information seeking skills are inadequate.

In addition, very little is known about how digital information-seeking skills influence generative AI use and advocacy behaviour among library and information science practitioners. Hence, this study hopes to bridge these gaps.

The current study aims to determine the influence of two types of perceived norms (descriptive norms and injunctive norms) on academic librarians' generative AI use behaviour and advocacy, while examining the mediating role of behavioural intention and the role of digital information-seeking skills. This study seeks to inform institutional adoption initiatives and guide policies for training and the ethical integration of generative AI for research and learning. Most importantly, it provides context-specific insights that identify constraints and enablers of AI integration within academic libraries.

Beyond examining generative AI uses among academic librarians, this study makes a theoretical contribution by refining the application of the Integrated Behavioural Model (IBM). While IBM recognises normative influence as a determinant of behaviour, prior technology adoption studies have often treated perceived norms as a single construct. By explicitly distinguishing between injunctive norms (perceived social approval) and descriptive norms (perceived behaviour of others) and examining their differential associations with both generative AI use and advocacy, this study extends IBM's explanatory scope. This refined application is particularly important within a non-Western academic library context,

where professional norms and institutional expectations may shape technology-related behaviours in distinct ways.

LITERATURE REVIEW

Theoretical Framework and Hypothesis Development

Research in social psychology and consumer behaviour suggests that a significant influencer of individuals' behavioural intentions and actual behaviour is the perception of social pressure. Findings from empirical, review and theoretical literature indicate that social influence is essential in adopting new technology (Kavandi & Jaana, 2020; Teo & Noyes, 2014; Venkatesh et al., 2016). Given this, research on the impact of social influence in the context of technology adoption has been heavily reliant on the Unified Theory of Acceptance and Use of Technology (UTAUT and UTAUT 2) (Venkatesh et al., 2003, 2012), compared to the subjective norms in the foundational theories on which the UTAUT is based, e.g. the Theory of Reasoned Action (TRA) (Heilbroner et al., 1980) and the Theory of Planned Behaviour (TPB) (Ajzen, 1991), which have been useful in a variety of change interventions (Hardeman et al., 2005; Jemmott, 2012; Mosleh et al., 2014). Perhaps this is based on the belief that social influence transcends individual beliefs of the opinion of relevant referent individuals to actual recommendations and behaviour (Eckhardt et al., 2009).

However, recent developments in the TRA and TPB have incorporated elements from similar behavioural theories to create

the integrated behavioural model (IBM). As hypothesised in the TPB and TRA, intention is the most potent predictor of behaviour. However, a strong intention to take on behaviour may depend heavily on knowledge and skill, the absence of or limited environmental constraints, strong behavioural salience and significant experience that makes behaviour habitual (Montãno & Kasprzyk, 2015). In the TRA and TPB, Subjective norms refer to the perceived social expectation of an individual to engage or refrain from a particular behaviour (Ajzen, 1991). Within these frameworks, subjective norms are injunctive (i.e. normative beliefs about the expectation and approval of others). However, this may not entirely capture normative influences (Montãno & Kasprzyk, 2015). According to Fishbein & Ajzen (2010), the perceived behaviour of one's referent group (descriptive norms) is also a potent attribute of normative influences. Meta-analytical studies' findings suggest that descriptive norms have a medium to strong correlation with behavioural intention and can be effective in interventions targeted at behavioural change (Borsari & Carey, 2003; Ravis & Sheeran, 2003). The current study examines normative pressure to use Generative AI through the Integrated Behavioural Model (IBM). While IBM accommodates both injunctive and descriptive norms, prior technology adoption research has often operationalised normative influence as a general construct. By explicitly separating injunctive norms and descriptive norms and examining their

differential associations with generative AI use and advocacy behaviours, this study refines the application of IBM in a professional technology adoption context. This distinction allows for a more nuanced understanding of normative influence, clarifying whether librarians' engagement with generative AI is driven primarily by perceived social approval or by observed effectiveness through colleagues' use. Given the explicit separation of injunctive and descriptive norms in IBM, we argue that the observed actual usage of generative AI by fellow librarians will influence usage intention, use behaviour, and advocacy. Therefore, we hypothesise that:

H1. Injunctive norm is positively associated with generative AI use behaviour among librarians.

H2. Descriptive norm is positively associated with generative AI advocacy behaviour.

H3. Injunctive norm is positively associated with generative AI advocacy behaviour.

H4. Descriptive norm is positively associated with generative AI use behaviour among librarians.

In addition to actual use, this study examines advocacy as a distinct behavioural outcome. While use behaviour reflects an individual's personal engagement with generative AI tools, advocacy involves actively recommending, endorsing, or promoting these tools to others. In the

context of academic librarianship, advocacy represents a meaningful extension of technology adoption because librarians function as information intermediaries, educators, and institutional actors whose professional recommendations can influence users' practices and institutional decision-making (Emanuel, 2013; Sun et al., 2011). As such, advocacy constitutes a socially oriented and professionally consequential behaviour that may be shaped by normative pressures in ways that differ from individual use.

A consensus in studies using the TRA, TPB, and IBM is that behavioural intention is the most significant predictor of behaviour (Fishbein & Ajzen, 2010; Montãno & Kasprzyk, 2015). The potency of intention is evident in a meta-analytical study on behavioural intention and behaviour change in experimental research, which found that a medium to a large change in intention is associated with a small to medium change in actual behaviour (Webb & Sheeran, 2006).

In technology adoption studies, intention not only gives a glance into users' adoption behaviour but can also offer insights into continued use and advocacy behaviour (Zhou & Ma, 2025). Indeed, various studies on generative AI use have limited their outcome variable to intention (Cao & Peng, 2024; Kim, 2025; Tang et al., 2025). At the same time, other studies maintained their role as a mediator (Ivanov et al., 2024; Zaim et al., 2024). According to Ajzen (2011), as time passes, more intervening events can influence the translation of intention into actual behaviour. However, experimental

or correlational research can explore the intention-behaviour relationship. Therefore, we hypothesise that:

H5a. Intention will mediate the relationship between injunctive norms and generative AI use behaviour.

H5b. Intention will mediate the relationship between descriptive norms and generative AI use behaviour.

H6a. Intention will mediate the relationship between injunctive norms and generative AI advocacy behaviour.

H6b. Intention will mediate the relationship between descriptive norms and generative AI advocacy behaviour.

Many behaviours relating to technology adoption require adequate skills for effective performance (Goncalves et al., 2018). Digital skills are essential for effective search, retrieval, dissemination, and ethical use of information (Akakpo, 2024). According to Ajzen (2014), for a positive intention to translate into actual behaviour, individuals must have the means, skills, and other necessary resources to perform the behaviour. Among librarians, digital skills, when available, can aid the development and management of digital library resources and improve service delivery (Hamad et al., 2021; Nisar et al., 2024; Okeji et al., 2020), and when insufficient, it can hinder the integration of technological innovation (Hoskins, 2005). It can also determine the diffusion of ICTs and advocacy (Hamad et al., 2021; Rafi et al., 2019). A study on the

determinants of ICT adoption behaviour found digital skills to be a significant moderator of technology adoption (Yu et al., 2017). Therefore, we hypothesise:

H7. Digital information skill is positively associated with generative AI use behaviour among librarians.

H8. Digital information skills are positively associated with generative AI advocacy among librarians.

Figure 1 presents the conceptual framework guiding this study. The framework posits that perceived norms, operationalised as injunctive and descriptive norms, serve as key social predictors of academic librarians' engagement with generative AI (Fishbein & Ajzen, 2010; Montãno & Kasprzyk, 2015). These normative influences are proposed to affect both generative AI use behaviour and advocacy directly, while also shaping behavioural intention to use generative AI. Behavioural intention

functions as a mediating mechanism through which normative pressures may translate into actual use and advocacy behaviours (Fishbein & Ajzen, 2010). In addition, digital information-seeking skills are conceptualised as a capability-based factor that directly supports both generative AI use and advocacy, reflecting the role of skills in enabling effective technology engagement (Ajzen, 2014; Yu et al., 2017). Together, the framework integrates social influence, intention, and skill-based resources to explain variation in generative AI use and advocacy among academic librarians.

MATERIALS AND METHODS

Participants and Procedures

This study employs a cross-sectional research design. A survey was conducted among academic librarians working in general and faculty libraries from 3 public universities in southwestern Nigeria: The Federal University of Technology, Akure,

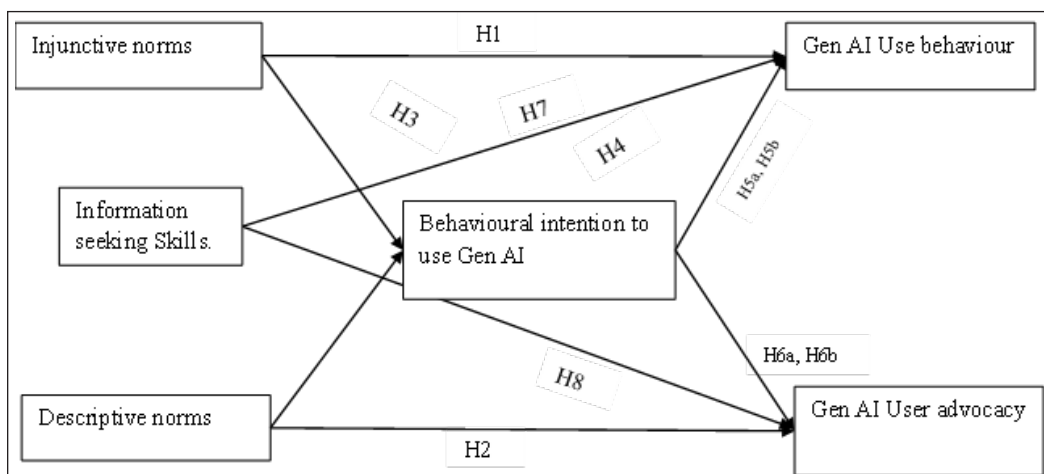


Figure 1. Conceptual framework

Ekiti State University and Federal University Oye. A simple random sampling technique was selected for this study because of its convenience and affordability benefits. Respondents were invited to participate in an online questionnaire through a Google Forms link. A descriptive analysis of the study samples is depicted in Table 1. Although the study draws on academic librarians from three public universities, the sample represents librarians within these specific institutional contexts rather than the entire population of academic librarians in Nigeria. Consequently, the findings should be interpreted as reflective of the sampled universities rather than broadly generalised across all academic library settings.

Respondents were predominantly male (54.9%) and aged 36 to 50 (52.2%). Most respondents (39.8%) have bachelor's degrees, and most respondents (57.5%) have worked as librarians for less than 10 years.

Questionnaire Design and Data Collection

A self-report questionnaire is instrumental in obtaining responses from the study participants. In addition to questions obtaining information on the demographic characteristics of the respondents, which solicits gender, age, level of education and number of years of librarianship experience information, the questionnaire also contained items from six major variables, namely.

1. Injunctive norms
2. Descriptive norms
3. Behavioural intention to use generative AI
4. Digital information-seeking skills
5. Generative AI use of behaviour
6. Generative AI user advocacy

Questions regarding injunctive and descriptive norms and intention to use

Table 1
Demographic characteristics of respondents

Variable	Frequency	Percentage (%)
Gender		
Male	62	54.9
Female	51	45.1
Age		
Below 35 years	13	11.5
36 to 50 years	59	52.2
Above 50 years	41	36.3
Level of education		
Diploma	38	33.6
Bachelor's degree	45	39.8
Master's degree	24	21.2
Doctorate	6	5.3
Years of librarianship experience		
Below 10 years	65	57.5
11 to 20 years	40	35.4
Above 20 years	8	7.1

generative AI were adapted from a prior study (Park & Smith, 2007) and phrased to fit the study's context appropriately. Sample items on injunctive norms are 'most people whose opinion I value would approve of my using Gen AI tools to search for information' and 'most people who are important to me would support that I use Gen AI tools to search for information'. Responses were obtained on a 7-point Likert-type scale ranging from 1 = 'Strongly Disagree' to 7 = 'Strongly Agree'. Sample items on descriptive norms are 'most people who are important to me use Gen AI tools to search for information' and 'most people whose opinions I value have used Gen AI tools to search for information'. Responses on descriptive norms were obtained on a 7-point Likert-type scale ranging from 1 = 'Strongly Disagree' to 7 = 'Strongly Agree'. Sample items on behavioural intention are 'I intend to use Gen AI tools to search for information in the near future' and 'I will use Gen AI tools to search for information in the near future'. Responses on behavioural intention were also obtained on a 7-point Likert-type scale ranging from 1 = 'Strongly Disagree' to 7 = 'Strongly Agree'.

Selected questions measuring generative AI use behaviour were adapted from the information-seeking behaviour scale designed by Timmers and Glas (2010) and rephrased to fit the study context. Respondents were asked to provide answers to the statement, 'When I search for information using generative AI tools. Sample items in the scale are 'I search for general background information of the topic'

and 'I adjust the questions when I find little or no information on the topic'. Items on the information-seeking behaviour scale were measured on a 6-point Likert-type scale, with responses ranging from 1 = 'Strongly Disagree' to 6 = 'Strongly Agree'. Questions measuring generative AI advocacy were adapted from the e-WOM scale designed by Goyette. et al. (2010). Some examples are 'I speak of Gen AI tools more frequently than any other information-seeking tools' and 'I discuss the user-friendliness of Gen AI tools. Responses were obtained from participants on a 7-point Likert-type scale, ranging from 1 = 'Strongly Disagree' to 7 = 'Strongly Agree'. A modified online searching skills questionnaire, which was designed to assess respondents' online searching self-efficacy by Monoi et al. (2005), was used to measure the digital information-seeking skills of respondents in the study. Sample items are 'I can construct a complex search using more than one Boolean operator and grouping terms using parentheses' and 'I can narrow or broaden my search to retrieve the appropriate quantity of information'. Responses were obtained on a 6-point Likert-type scale ranging from 1 = Strongly Disagree to 6 = 'Strongly Agree'.

Preliminary Analysis

The dataset for this study was cleaned before data analysis to remove missing values and outliers. Descriptive data such as age, gender, level of education and number of years of librarianship experience were analysed using IBM SPSS version 24. However, the research hypothesis was

analysed using Smart PLS software version 4.1.1.1. A structural equation modelling comprising 5000 bootstrapping sub-samples was conducted. PLS-SEM was chosen for the study because it utilises multiple observed indicators to measure unobserved latent concepts. It also confirms and validates the constructs of an instrument and their relationships with other constructs (Chin, 1998; Hair et al., 2014). PLS-SEM is particularly relevant for the current study because it can ameliorate the inadequacies of studies conducted with small samples (Rigdon et al., 2017). Although PLS-SEM is appropriate for exploratory models and complex relationships, the results should be interpreted with an awareness of its emphasis on prediction rather than overall model fit, and its reliance on correlational data.

PLS-SEM is specifically designed to achieve greater statistical power with small sample sizes compared to covariance-based SEM. According to Hair et al. (2017), at least 100 samples are recommended for PLS-SEM models with multiple arrows pointing at endogenous variables, assuming medium effect sizes, 5% significant levels and 80% power. Considering that the current study has two endogenous variables each receiving four arrows, the sample size of 113 comfortably meets these guidelines, satisfying the Inverse Square Root requirement. G power analysis was instrumental in determining the minimum required sample size for the study. For studies with medium effect sizes (i.e., $f^2 = 0.15$) and a power of 0.80, the minimum

sample size typically used in social science research is approximately 80-100 (Cohen, 1988).

RESULTS

Measurement Model

All constructs in the study were reflectively measured. According to Ringle et al. (2020), the reflective measurement model examines indicator reliability, convergent and discriminant validity, and internal consistency.

As table 2 depicts, the indicator loadings of all constructs exceeded the 0.5 significant threshold. Composite reliability scores for all constructs ranged from 0.78 to 0.89, and average variance extracted scores ranged from 0.50 to 0.63. Hence, all constructs in the study met the criterion for acceptable convergent validity. Results in table 2 also show that all the constructs in the model passed the reliability test, with Cronbach's alpha scores ranging from 0.62 to 0.85, suggesting that the constructs demonstrated medium to strong internal consistency.

To assess the discriminant validity of the study constructs, the Fornell and Larcker (1981) criterion and HTMT (Henseler et al., 2015) scores were evaluated. According to Fornell & Larcker's criterion, the assumption of discriminant validity is met when the AVE of each construct is greater than the squared correlation between a construct and any other construct in the model. Also, Henseler and colleagues posit that discriminant validity is achieved when the comparison of heterotrait and monotrait

Table 2
Construct validity and reliability.

Construct	Indicators	Factor loadings	VIF	Average Variance Extracted (AVE)	Rho_A	Composite Reliability (CR)	Cronbach's α
Descriptive Norms (DN)	DN1	0.838	1.411	0.575	0.681	0.797	0.623
	DN3	0.841	1.434				
	DN5	0.561	1.106				
Injunctive Norms (IN)	IN1	0.824	1.48	0.636	0.732	0.839	0.713
	IN3	0.848	1.534				
	IN5	0.714	1.281				
Behavioural Intention (BI)	BI1	0.888	1.798	0.514	0.84	0.798	0.712
	BI2	0.524	1.518				
	BI3	0.865	1.807				
	BI4	0.500	1.473				
Information Seeking Skills (ISS)	ISS1	0.742	1.513	0.501	0.834	0.857	0.808
	ISS11	0.681	2.096				
	ISS3	0.75	1.62				
	ISS5	0.677	1.543				
	ISS7	0.665	1.646				
Generative AI use behaviour (ISB)	ISS9	0.728	2.343	0.538	0.864	0.89	0.857
	ISB1	0.761	1.808				
	ISB11	0.783	2.137				
	ISB13	0.663	1.747				
	ISB3	0.736	1.874				
	ISB5	0.723	1.725				
	ISB7	0.768	1.827				
	ISB9	0.691	1.611				
	GAIAB1	0.763	1.522				
GAIAB3	0.79	1.431					
GAIAB5	0.679	1.394					
GAIAB7	0.654	1.187					
Generative AI Advocacy Behaviour (GAIAB)				0.524	0.707	0.814	0.70

correlation ratios produces scores less than 0.85 or 0.9. The heterotrait correlation refers to cross-construct correlations, while the monotrait correlation refers to within-construct correlations (Rönkkö & Cho, 2022).

The results in Table 3 show that the assumptions of discriminant validity were not violated, as the AVE of each construct is greater than the squared correlation between other constructs, and HTMT values in the model were less than 0.9.

Structural Model

After confirming that the measurement model of PLS-SEM meets all relevant criteria, researchers can interpret the structural model, which involves running robustness checks to ensure the stability of results (Hair et al., 2019). These include examination of the coefficient of determination (R²), Cross-validated redundancy (Q²), Collinearity statistics, and the path coefficient for reflective measurements. The R² value for generative AI use behaviour (0.591) indicates the proportion of variance in information-seeking using generative AI

that is associated with injunctive norms, descriptive norms, and digital information-seeking skills. In addition, generative AI advocacy behaviour produced an R² value of 0.372, indicating that the independent variables in the model are associated with 37.2% of the variance in generative AI advocacy behaviour. The R² value for behavioural intention (0.262) indicates that injunctive and descriptive norms are associated with 26.2% of the variance in behavioural intention.

The model's predictive power was evaluated using the cross-validated redundancy Q² values. This test omits a portion of the data matrix, approximates the model's parameters and predicts the omitted portion using the estimates that were previously computed (Ringle et al., 2020). According to Chin (1998), a model's predictive accuracy is sufficient when a high Q² value results from a small difference between the predicted and actual values. Hence, Q² values greater than 0, 0.25 and 0.50 demonstrate small, medium and large predictive relevance, respectively (Hair et al., 2019). The

Table 3
Discriminant validity of constructs

Constructs	Fornell-Lacker						HTMT				
	1	2	3	4	5	6	1	2	3	4	5
BI	0.717										
DN	0.435	0.758					0.586				
GAIAB	0.398	0.486	0.724				0.506	0.704			
IN	0.472	0.577	0.521	0.797			0.553	0.863	0.709		
ISB	0.59	0.594	0.505	0.659	0.733		0.655	0.784	0.618	0.833	
ISS	0.604	0.516	0.489	0.448	0.58	0.708	0.742	0.686	0.596	0.566	0.647

Q^2 values for behavioural intention, generative AI advocacy behaviour and generative AI use behaviour in the study's model were 0.22, 0.32 and 0.53, respectively. Therefore, behavioural intention demonstrates a small predictive power, generative AI advocacy behaviour demonstrates a medium predictive power, while generative AI use behaviour demonstrates a large predictive power. The assumptions of collinearity were not violated in the study's model, as VIF for all indicators was below three, based on Hair et al. (2019).

The results presented in Table 4 show that five of the six direct hypotheses proposed in the study were supported by statistically significant associations at the $p = 0.05$ significance level. Injunctive norm was significantly and positively associated with generative AI use behaviour ($\beta = 0.35$, $t = 3.86$, $SD = 0.093$, $f^2 = 0.188$, $p = 0.000$). Similarly, descriptive norm was significantly and positively associated with generative AI use behaviour ($\beta = 0.19$, $t = 2.06$, $SD = 0.095$, $f^2 = 0.054$, $p = 0.039$). Therefore, the findings confirmed H1 and H4.

The results also reveal that injunctive norm is significantly and positively associated with generative AI advocacy behaviour ($\beta = 0.29$, $t = 2.47$, $SD = 0.119$, $f^2 = 0.082$, $p = 0.013$). In contrast, descriptive norms were not significantly associated with generative AI advocacy behaviour ($\beta = 0.175$, $t = 1.678$, $SD = 0.104$, $f^2 = 0.028$, $p = 0.093$). Consequently, these findings confirmed H3 and rejected H2. Furthermore, digital information-seeking skills were

significantly and positively associated with generative AI use behaviour ($\beta = 0.18$, $t = 2.11$, $SD = 0.086$, $f^2 = 0.045$, $p = 0.035$). Also, digital information-seeking skill was significantly and positively associated with generative AI advocacy behaviour ($\beta = 0.245$, $t = 2.09$, $SD = 0.117$, $f^2 = 0.053$, $p = 0.035$). Therefore, the findings confirmed hypotheses H7 and H8.

Regarding the effect size (f^2), which measures a change in R^2 with the omission of an exogenous construct, Cohen (1988), suggests that values of 0.02, 0.15 and 0.35 represent small, medium, and large effects, respectively. For generative AI use behaviour, the effect sizes for the exogenous constructs were injunctive norms ($f^2 = 0.188$), descriptive norms ($f^2 = 0.054$), and digital information seeking skills ($f^2 = 0.045$). For generative AI advocacy behaviour, the effect sizes were injunctive norms ($f^2 = 0.082$), descriptive norms ($f^2 = 0.028$), digital information seeking skills ($f^2 = 0.053$). The results show that injunctive norms have the strongest influence on both generative AI usage behaviour and advocacy behaviour. In contrast, descriptive norms have the least impact on advocacy behaviour. Additionally, it is important to note that the effects of digital information-seeking skills on both key constructs in this study are substantial.

Mediation Test of Behavioural Intention

The relationship between injunctive norms and generative AI use behaviour in the direct model was statistically significant, as shown in table 5. When behavioural

Table 4
Results of direct hypothesis testing

H	Constructs	β	STDEV	T	Sig	Conclusion
H4	DN -> GAIAB	0.175	0.104	1.678	0.093	Not Significant
H2	DN -> ISB	0.195	0.095	2.062	0.039	Significant
H3	IN -> GAIAB	0.293	0.119	2.473	0.013	Significant
H1	IN -> ISB	0.357	0.093	3.863	0.001	Significant
H8	ISS -> GAIAB	0.245	0.117	2.097	0.036	Significant
H7	ISS -> ISB	0.182	0.086	2.111	0.035	Significant

Table 5
Results of the indirect effects of behavioural intention

Path	β	P values	95% CI Bootstrap BC		Conclusion
			LB	UB	
DN -> BI -> GAIAB	0.009	0.762	-0.042	0.078	Not significant
DN -> BI -> ISB	0.055	0.1	0.009	0.154	Not significant
IN -> BI -> GAIAB	0.012	0.753	-0.054	0.097	Not significant
IN -> BI -> ISB	0.075	0.038	0.021	0.172	Significant

intention was included in the model, injunctive norm remained a significant predictor of generative AI use behaviour ($\beta = 0.075$, $t = 2.079$, $p = 0.038$). These results indicate that behavioural intention serves as a mediating variable in the association between injunctive norms and generative AI use behaviour. Accordingly, hypothesis H5a was supported.

In contrast, the results presented in Table 5 indicate that behavioural intention did not function as a mediating variable in the association between descriptive norms and generative AI use behaviour ($\beta = 0.055$, $t = 1.643$, $p = 0.100$), injunctive norms and generative AI advocacy behaviour ($\beta = 0.012$, $t = 0.314$, $p = 0.753$), and descriptive norms and generative AI advocacy behaviour ($\beta = 0.009$, $t = 0.303$, $p = 0.762$). Therefore,

hypotheses H5b, H6a and H6b were not supported.

DISCUSSIONS

The study's primary objective was to examine the role of perceived norms and information-seeking skills on generative AI use and advocacy behaviours when behavioural intention is a mediator among academic librarians. The integrated behavioural model provided a sound foundation for explaining generative AI use and advocacy behaviours. The positive association between injunctive norms and both generative AI use and advocacy behaviours can be understood through the role of perceived social approval and professional expectations in shaping librarians' technology-related decisions, as emphasised in behavioural models of

normative influence (Fishbein & Ajzen, 2010; Montão & Kasprzyk, 2015). Within academic library environments, librarians operate in close professional communities where peer expectations, managerial signals, and institutional culture strongly influence perceptions of acceptable and valued practices. When the use of generative AI is perceived as professionally endorsed or socially approved, librarians are more likely to align their behaviour with these expectations, not only by adopting the technology for their own information-seeking activities but also by supporting its broader diffusion, a pattern consistent with prior studies on social influence and technology adoption (Zino et al., 2022). Informal workplace interactions further reinforce this process by increasing awareness of colleagues' competencies and shared norms, thereby strengthening confidence in using emerging technologies (Cross et al., 2001). In addition, librarian-led generative AI training initiatives may function as visible institutional cues that legitimise generative AI use, reinforcing both individual engagement and professional endorsement of these tools within academic library settings (Carroll & Borycz, 2024).

The findings of this study also underscore the importance of contextualising the integrated behavioural model within a developing-country academic library setting. In contexts such as Nigeria, where institutional resources, formal AI policies, and infrastructural support may be uneven, social and professional norms can assume a more central role in shaping technology-

related behaviours. Under such conditions, librarians may rely more heavily on peer expectations, professional approval, and shared workplace practices to guide decisions about engaging with emerging technologies. Prior research on emerging digital technologies in Nigeria, including frameworks for integrating metaverse technologies into educational contexts, highlights how institutional readiness, ethical considerations, and contextual constraints shape the adoption and use of advanced digital systems (Badiru & Aladelusi, 2023). This suggests that the influence pathways proposed in the integrated behavioural model may operate differently in non-Western professional environments, with normative pressures partially compensating for structural constraints (Fishbein & Ajzen, 2010; Montão & Kasprzyk, 2015). By demonstrating how injunctive and descriptive norms function within this context, the study extends the applicability of IBM beyond predominantly Western settings and supports the need for context-sensitive interpretations of technology adoption models.

The association between descriptive norms and generative AI use behaviour can be explained by observational learning and social comparison processes within academic library settings, where individuals often look to peers for behavioural cues when engaging with new technologies (Miranda et al., 2024). When librarians observe colleagues using generative AI tools effectively, such behaviours provide practical cues about the utility, legitimacy,

and appropriateness of the technology for professional tasks. This form of learning helps reduce uncertainty surrounding emerging technologies and lowers perceived risk, thereby making individual experimentation more likely. Observing peers' successful use of generative AI may also normalise its integration into everyday information-seeking practices, encouraging wider uptake through shared professional routines (Miranda et al., 2024). Within academic libraries, these social learning processes can further promote collaboration, experimentation, and knowledge sharing, creating an organisational environment that supports the diffusion of generative AI tools (Gupta, 2025).

The association between injunctive norms and generative AI advocacy behaviour can be understood in relation to the evolving professional role of academic librarians and the expectations attached to that role. Prior research has shown that innovations in information technology have progressively expanded librarians' responsibilities beyond information provision to include instructional and educational functions, positioning them as key actors in promoting information literacy and responsible technology use (Sun et al., 2011). As teaching, learning, and research practices become increasingly technology-mediated, librarians' engagement with emerging tools is often evaluated against professional and institutional expectations. Within this context, perceived expectations from colleagues, supervisors, and the broader academic community can motivate

librarians to move beyond personal use and actively endorse generative AI as part of their professional mandate. This normative pressure may be particularly salient among younger librarians, who may view advocacy for new technologies as a way of shaping professional identity, demonstrating competence, and contributing to the future direction of librarianship (Emanuel, 2013).

Advocacy represents a qualitatively different behavioural outcome from individual use, as it involves public endorsement, recommendation, and professional signalling rather than private engagement with technology. Within academic librarianship, advocacy is closely tied to professional identity and institutional responsibility, as librarians act as educators, information intermediaries, and trusted advisors whose recommendations can shape students' practices, faculty behaviour, and organisational adoption decisions (Emanuel, 2013; Sun et al., 2011). Because advocacy is outward-facing and professionally visible, it carries greater reputational and normative risk than individual use, making it more sensitive to perceived social approval and professional expectations. In this sense, librarians may be willing to experiment with generative AI based on observation alone, while advocacy requires stronger normative alignment and institutional legitimacy. This distinction helps explain why injunctive norms play a more prominent role in motivating advocacy behaviours, whereas descriptive norms may be sufficient to encourage individual experimentation and use (Zino et al., 2022).

The association between digital information-seeking skills and generative AI use behaviour can be explained by the role of skills in reducing cognitive and technical barriers to engaging with emerging technologies. Librarians with stronger digital competencies are better equipped to evaluate, experiment with, and integrate new tools into their information-seeking workflows, which increases confidence and lowers perceived difficulty when adopting generative AI. Prior studies indicate that digital information skills support effective search, retrieval, and ethical use of information technologies, thereby facilitating engagement with novel digital systems (Bolasco, 2023). This relationship is further reflected in evidence that library and information science students draw on existing information retrieval, summarisation, and analytical skills when incorporating AI tools into academic and professional tasks (Hossain et al., 2025). In this sense, digital information-seeking skills function as enabling resources that make the transition from traditional information practices to generative AI use more attainable within academic library contexts (Kalbande et al., 2024a).

The association between digital information-seeking skills and generative AI advocacy behaviour can be understood through the link between competence, credibility, and professional influence within academic libraries. Prior research has shown that librarians with strong digital competencies are often positioned as trusted experts in ethical information

practices and technology governance, which enhances their professional credibility within institutions (Michalak, 2023). As a result, such librarians are more likely to feel confident in evaluating the benefits, limitations, and ethical implications of generative AI tools, increasing their willingness to publicly recommend or support their adoption. In organisational settings, employees with specialised skills frequently exert greater influence over technology-related decisions, particularly in contexts where managerial expertise in emerging technologies is limited, and leadership relies on expert input to navigate innovation and risk (Daft, 2017). In this way, digital information-seeking skills enable librarians not only to use generative AI effectively but also to assume advocacy roles grounded in expertise and institutional trust.

The mediating role of behavioural intention highlights the psychological process through which normative pressures are translated into generative AI use among academic librarians. Behavioural intention reflects a deliberate readiness to act, shaped by perceived social approval and professional expectations, and serves as a proximal driver of actual behaviour (Fishbein & Ajzen, 2010). When injunctive norms signal that generative AI use is professionally valued or expected, librarians are more likely to form strong intentions to integrate such tools into their information-seeking practices. Prior research suggests that intention plays a central role in converting social influence into technology adoption, particularly in

professional contexts where norms function as intrinsic motivators (Nassar et al., 2019). This mechanism may be especially salient in academic libraries, where professional norms can at times outweigh formal managerial directives, reinforcing the role of intention as a bridge between social expectations and technology use (Fang et al., 2025; Venkatesh et al., 2012).

CONCLUSION

This study demonstrates that the integrated behavioural model provides a robust framework for understanding generative AI use and advocacy among academic librarians when normative influences, intention, and skill-based capabilities are considered together. By distinguishing between injunctive and descriptive norms and examining their associations with both use and advocacy behaviours, the study extends the application of IBM to a professional technology adoption context within a developing-country academic library environment. The findings highlight how perceived social approval, observed peer behaviour, and digital information-seeking skills jointly shape librarians' engagement with generative AI, with behavioural intention serving as a key mechanism linking normative pressures to actual use. Beyond individual adoption, the study underscores advocacy as a distinct and professionally consequential outcome, reflecting librarians' roles as educators and institutional actors. Collectively, these insights advance understanding of how social, cognitive, and contextual factors

interact to influence emerging technology adoption in academic libraries, particularly outside Western-centric research settings.

Theoretical Contributions

This study contributes to the literature in several important ways. First, it extends scholarship on generative AI adoption in library and information science by empirically examining both use and advocacy behaviours among academic librarians, an outcome combination that remains underexplored. Second, by distinguishing between injunctive and descriptive norms, the study refines the application of the integrated behavioural model, demonstrating that normative influences may operate differently depending on the nature of the behaviour under investigation. Specifically, injunctive norms appear more salient for behaviours involving persuasion, endorsement, and social approval, whereas descriptive norms may be more relevant for observable and collective practices. Third, the findings underscore the role of digital information-seeking skills as a capability-based enabler of both use and advocacy, highlighting how skills can reinforce normative influences and support organisational-level technology diffusion. Finally, the absence of a significant mediating role of behavioural intention in advocacy behaviour suggests that advocacy may be driven by additional motivational mechanisms beyond intention, pointing to the need for future theoretical extensions that incorporate factors such as trust, professional identity, or ethical orientation.

Practical implications of the study

The findings of this study also offer practical implications for academic and special libraries. First, the strong role of digital information-seeking skills in both generative AI use and advocacy suggests the need for continuous, targeted training programmes that focus not only on technical proficiency but also on ethical and responsible AI use in library services. Such training initiatives could include practical modules on information retrieval, content evaluation, bias awareness, and privacy protection when using generative AI tools.

Second, the limited role of descriptive norms in predicting advocacy behaviour indicates that mere exposure to colleagues' AI use may be insufficient to encourage active promotion of generative AI. To address this, library leadership and senior professionals can play a more visible role in legitimising ethical AI use by explicitly endorsing AI-related initiatives, supporting peer mentoring, and creating formal opportunities for knowledge sharing. Clear institutional signals of approval may therefore be critical in transforming individual experimentation into collective advocacy and sustained adoption.

Limitations and Directions for Future Research

Although the current study offers valuable insights into the application of the Integrated Behavioural Model to generative AI research, several limitations should be considered when interpreting the findings.

First, the cross-sectional design restricts the ability to conclude changes in perceived norms, skills, and behaviours over time. As a result, the observed associations should be interpreted as reflective of relationships at a single point rather than as developmental or causal processes. Future longitudinal studies could provide deeper insight into how generative AI use and advocacy evolve as institutional familiarity increases.

Second, because generative AI was still an emerging technology at the time of data collection, participants' levels of familiarity may have influenced how norms, intention, and skills were formed and expressed. Consequently, the findings should be interpreted within the context of early-stage adoption, and future research may consider examining more established information technologies or conducting follow-up studies as generative AI becomes more embedded in professional practice.

Third, the study was limited to academic librarians in Nigerian public universities, which may constrain the generalisability of the findings to other library types or professional sectors. Therefore, the results should be interpreted as context-specific, and future studies may extend the model to public libraries, private institutions, or other industries to assess its applicability across different organisational and cultural contexts.

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Revealing Intentions of Substance Abuse: How Adverse Childhood Experiences and Sensation-seeking Affect Adolescents in High-risk Areas

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ABSTRACT

Drug addiction continues to be a significant global social issue affecting both individuals and society. Adolescents are recognised as the most vulnerable group and the primary contributors to drug addiction statistics. Factors such as psychosocial development, peer influence, adverse childhood experiences, and curiosity contribute to early substance use. This study investigates the factors influencing substance abuse intention (SAI) among adolescents living in high-risk areas of Peninsular Malaysia, utilising the Theory of Planned Behaviour (TPB) as its primary framework. It specifically explores the mediating role of adverse childhood experiences (ACE) and the moderating effect of sensation seeking. Data were gathered from 112 adolescents using homogeneous convenience sampling. Analysis was conducted utilising Partial Least Squares structural equation modelling (PLS-SEM). Results indicate that attitude, subjective norms, and sensation seeking serve as direct predictors of SAI. A partial mediating effect of ACE was found in the relationship between subjective

norms and SAI, while sensation seeking significantly moderated the relationship between attitude and SAI. These findings illuminate the considerations that adolescents in at-risk areas make regarding substance abuse, providing valuable information for policymakers to address these factors and prevent early substance use among adolescents. By introducing three new psychological constructs, this study expands the TPB's application for predicting intentions in substance abuse research. It also addresses a significant gap in understanding the critical

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factors influencing adolescent substance abuse. A deeper understanding of these factors can enhance awareness of where intervention strategies may be more effective.

Keywords: Adverse childhood experiences, sensation seeking, substance abuse intention, theory of planned behaviour

INTRODUCTION

Drug addiction is widely recognised as a chronic and multifaceted condition, as well as a form of social pathology that poses a serious threat to human health and societal well-being. Globally, nearly 292 million people aged 15 to 64, or about one in every 18 individuals, were estimated to have used drugs in the previous 12 months (United Nations Office on Drugs and Crime, 2024). Reflecting this global trend, Malaysia also experienced a concerning rise in drug abuse, with a prevalence of 436 individuals per 100,000 population. Recent national statistics show an 11.27 percent increase in recorded drug users, reaching a total of 130,788 in 2023. Notably, youth remain the most affected group, as individuals aged 15-39 make up 63.2 percent of drug-related cases; an increase of 4.2 percent from previous years, while adolescents aged 14-19 account for an additional 1.98 percent of identified users (National Anti-Drug Agency [NADA], 2020). Various initiatives and strategies have been implemented to address the issue of drug addiction among youth, aligning with NADA's aims to reduce this rate to 400 or fewer per 100,000 residents by 2025. This target aligns with the United Nations Sustainable Development Goal (SDG) 3, target 3.5, which aims to improve the prevention and treatment of

substance abuse while supporting the vision of safe, resilient communities outlined in SDG 16. The prevalence indicators emphasise the scale of the challenge and the essential importance of coordinated, multisectoral action in achieving the National Drug Policy's goal of drug-free families, communities, and workplaces.

Adolescents are particularly susceptible to drug addiction due to the interplay of multiple vulnerability and risk factors (Ersche et al., 2020). This period represents a critical transition during which adolescents and young adults are more vulnerable to substance initiation and misuse. Substance exposure during adolescence has been shown to markedly increase the risk of later substance use disorders (Kirsch & Lippard, 2022), which naturally heighten their curiosity and interest. Within the Theory of Planned Behaviour (TPB), adolescent curiosity shapes attitudinal belief. However, its translation into intentions to use substances depends on subjective norms and perceived behavioural control. Affiliation with substance-using peers and permissive or conflicted family climates elevates injunctive and descriptive norms that favour use, while low-income family functioning and perceived ease of access erode control beliefs, thereby strengthening intentions to experiment or use (Bunu et

al., 2023; Latt et al., 2024; Nakibuuka & Nalubega, 2022).

Curiosity is a normative adolescent phenomenon because adolescents are developmentally predisposed. However, when compounded with poor environmental factors, this process may become a strong risk factor that leads to further substance use. Based on the TPB, the intention to engage in substance use depends on three constructs, namely, attitudinal beliefs, subjective norms, and perceived behavioural control. Peer influence, in particular, affiliation with drug-using peers is pivotal in the formation of normative beliefs, whereas familial risk factors such as poor functioning, history of substance use can weaken behavioural control and self-efficacy (Bunu et al., 2023; Latt et al., 2024; Nakibuuka & Nalubega, 2022). Socioeconomic disadvantage, including poverty and inadequate socioeconomic support, may heighten the risk of substance misuse by increasing exposure to stress, hopelessness, and psychological depression among vulnerable youth (Kamal et al., 2024). The interaction of dysfunctional family conditions and environmental deprivations may contribute to adverse childhood experiences (ACEs) and early adversity, which have been linked to earlier initiation of substance use and greater vulnerability to problematic substance use among young people (Meadows et al., 2024; Mongan et al., 2025). Previous studies show that cumulative exposure to ACEs significantly increases an individual's likelihood of substance dependence, and greater ACE scores are also associated with

severe substance dependence trajectories or poorer treatment outcomes (Bogetić et al., 2023). This association is also enhanced by sense-seeking, a state of personality characterised by an interest in new, extreme experiences, as well as an openness to risks associated with them. The results show that ACEs such as emotional abuse and neglect may influence sensation-seeking among emergent adults, thus increasing their risk-taking tendency (Babad et al., 2021). However, there are minimal studies on ACE, sensation seeking, and adolescents' substance abuse in the Asian context. Thus, this study was designed to investigate its relationship in the local context, and the data will contribute to relevant agencies and policymakers in preventing adolescents' involvement in drug abuse.

LITERATURE REVIEW

The TPB suggests that intention is the primary predictor of behaviour, and it is shaped by attitude, subjective norms, and perceived behavioural control (Ajzen, 2005). These constructs represent views on the behaviour, any perceived social expectations, and perceived ability to execute or resist such behaviour (Fishbein and Ajzen, 2010). TPB is also extensively used in both health and risk research due to its parsimonious but adaptable model to predict intention in a variety of contexts, and longitudinal research findings suggest that its results remain constant over time (Hagger and Hamilton, 2023). TPB, therefore, offers a theoretically sound explanation of the intentions of adolescents to use substances.

Attitude and Substance Abuse Intention

Adolescents' attitude towards substance use is among the leading determinants of substance abuse, with a positive attitude more likely to increase abuse than a negative attitude (Garcia-Cerde et al., 2021). These attitudes are shaped by various factors, including age, gender, religion, environment, socioeconomic status, and educational background; however, the findings of empirical evidence on these factors tend to contradict one another. Young people, due to their increased curiosity, may have a positive attitude towards alcohol and substance use; however, this positive disposition may decline with age. In a study of 174 medical students, Shafiq et al. (2006) found that senior students rated substances as less beneficial than junior students. A similar pattern was reported among 400 Jordanian high school students, where Haddad et al. (2010) found that 65% of respondents viewed substance use as a serious issue, with older students showing greater awareness than younger students. Although males have traditionally shown higher rates of substance use disorders than females, the gender gap has been narrowing over time (McHugh et al., 2018). Indeed, research indicates that adolescent girls may be more likely than boys to engage in polydrug and alcohol use (Garcia-Cerde et al., 2021).

Changes in social environment and cultural context may shape adolescents' attitudes and intentions towards substance abuse. A comparative study of Middle

Eastern adolescents living in Los Angeles, California, and Beirut, Lebanon, found that a longer duration of residence in the United States was associated with a greater likelihood of substance abuse among both Muslim and Christian adolescents (Badr et al., 2014). At the same time, substance use remains an important public health concern in Middle Eastern countries. Evidence from a systematic review of youth in the Eastern Mediterranean region suggests that attitudes and subjective norms are significantly associated with intentions to use substances, highlighting the importance of sociocultural influences in shaping substance-related perceptions and behaviours (El Khoury et al., 2019). Therefore, we hypothesise:

H1. Attitude is positively associated with intention to abuse substances among adolescents in at-risk communities.

Subjective Norms and Substance Abuse Intention

Social influence plays an important role in substance abuse among adolescents. Subjective norms refer to an individual's perception of social approval or disapproval regarding a particular behaviour, especially from important referent groups, and this perceived social pressure may shape behavioural intention (Ajzen, 1991). Research indicates that the influence of referent groups and environment on adolescent substance abuse intention is very potent, where the onset of cannabis use is

associated with drug use among friends and time spent in bars and discos, and the predictive effects of subjective norms on binge drinking intention was more potent when accessed in a bar than in the library (Cooke & French, 2011; Guxens et al., 2007). According to (Dir et al., 2017), a key socio-developmental determinant of binge drinking among female adolescents is peer influence, while males are more vulnerable to binge drinking because of gendered norms that socially accept and even sometimes reward boys for binge drinking. Although peer influence on adolescent substance abuse is usually manifest during adolescence, latent influences that emerge after adolescence are also possible. For instance, Visser et al. (2013) presented evidence that having alcohol users as friends during adolescence increases the likelihood of alcohol abuse during young adulthood. Also, many children in the United States live with a parent who misuses alcohol or other substances, and this exposure may increase their vulnerability to later substance use problems (Straussner & Fewell, 2011; Usher et al., 2015). A recent study found an indirect association between older siblings' cannabis and e-cigarette use and adolescents' later substance use intention (Maiya et al., 2023). Therefore, we hypothesise:

H2. Subjective norms are positively associated with intention to abuse substances among adolescents in at-risk communities.

Perceived Behavioural Controls and Substance Abuse Intention

According to Ciranka and van den Bos (2021), adolescents are active explorers and learners whose propensity for risk-taking may increase when they encounter opportunities to explore, take risks and adapt to their environment. Perceived behavioural control refers to an individual's perceived ease or difficulty in performing a particular behaviour (Ajzen & Madden, 1986). Within the Theory of Planned Behaviour, perceived behavioural control is one of the strongest predictors of actual behaviour because, together with intention, it serves as a direct predictor of behaviour (Ajzen, 2011). A meta-analytic study of the moderating effects of perceived behavioural control on all TPB constructs in 39 health-related studies found that the stronger people believe they can control a particular behaviour, the more likely they are to act on their intentions. Research indicates that young people's behavioural control beliefs over consuming substances vary from their control beliefs over obtaining them (Orbell et al., 2001). This finding highlights the key role that the environment plays in controlling beliefs about substance abuse. A longitudinal study involving 514 children of alcoholic parents and matched controls found that slower rates of increase in behavioural control were associated with a greater likelihood of alcohol and illicit drug use during adolescence, while higher initial levels of resiliency were linked to a lower likelihood of early alcohol use

(Wong et al., 2006). Similarly, in a study of early adolescents in at-risk communities characterised by widespread substance abuse problems, perceived behavioural control is the predominant factor that predicts substance use intention (Huang et al., 2014). Therefore, we hypothesise:

H3. Perceived behavioural control is positively associated with intention to abuse substances among adolescents in at-risk communities.

Knowledge of Substances and Substance Abuse Intention

Adolescents generally become more aware of substance use as they grow older, partly because this stage of life is often marked by curiosity and exploration. However, their understanding of substance-related symptoms, withdrawal, and treatment remains relatively limited (El Khoury et al., 2019). Greater age is often associated with better knowledge of substance use, as shown by Haddad et al. (2010), who reported that more than a quarter of students considered their knowledge to be very good, especially regarding the harmful effects of substances on the body and society. Adolescents also tend to receive substance-related information from those around them, particularly peers (Macdonald & Howard, 2020; Manuel et al., 2024). At the same time, media and online platforms have become increasingly influential sources of such information (Engel et al., 2024; Hendriks et al., 2020; Kong et al., 2019). It is important to note that knowledge of

the harmful effects of substances does not always translate to avoidance. A study of secondary school students in Kenya found that three-quarters of students were aware of the health risks associated with drug use; however, almost an equal number of participants in the study knew a schoolmate who was on drugs (Ndetei et al., 2010). A recent systematic review of studies on cannabis knowledge and risk perception among adolescents found that intention to use and current usage of cannabis reduce with higher levels of knowledge and/or perception of risk (Harrison et al., 2024). Also, research indicates that although at-risk youths may rely heavily on trusted friends for drug information, they also use the internet to obtain additional information about side effects and associated risks before trying them (Macdonald & Howard, 2020). Therefore, we hypothesise:

H4. Knowledge of substance use is negatively associated with intention to abuse substances among adolescents in at-risk communities.

Mediating role of adverse childhood experiences

Though the TPB primarily deals with immediate psychological variables, it can also incorporate more background variables, like personality, social setting, and life experiences that would indirectly influence intention via attitudes, social norms, and control beliefs (Ajzen, 2005; Fishbein and Ajzen, 2010). This concept is common in health behaviour studies, in which

TPB has typically been integrated with larger developmental and environmental frameworks to more effectively understand behaviour (Conner & Norman, 2015). It is particularly crucial during adolescence, as this period of life is characterised by heightened peer influence, life stress, and brain alterations that influence reward seeking and self-control (Romer et al., 2017). This is why, the inclusion of developmental risk factors and personality traits into TPB is theoretically justified when their roles are clearly articulated.

Adverse Childhood Experiences (ACEs) are defined as stressful or harmful events in childhood, which may impact the emotional control, coping skills, and thinking patterns, which consequently influence the way adolescents interpret social situations and the way they evaluate risky behaviour (Cicchetti, 2016). Developmental theory demonstrates that early adversity may alter the path of development and predispose a child to unhealthy coping or a high risk of making dangerous decisions later in life (Cicchetti, 2016). Within an extended TPB model, ACE could be considered a process that assists in explaining why certain adolescents tend to translate positive attitudes or lax social norms regarding substance use more often than others into actual intention. Simply put, early adversity could render certain young people more susceptible to stress or social pressure, which can strengthen the connection between their beliefs and their intentions.

Research indicates that ACE is associated with adolescent risk-taking

partly because it reduces self-control, which implies that its effects are typically mediated by psychological mechanisms as opposed to being direct (Wang et al., 2025). Studies also reveal that adolescent risk taking is best explained by interactions of several factors, particularly how stressful environments affects thinking and emotions that influence decision-making (Bozzini et al., 2020). Corresponding results indicate that challenging life circumstances modulate risk behaviour via mental and self-regulation capacities (Jia et al., 2021). This evidence, combined with the factors discussed earlier, contributes to the notion that ACE can be a mediator in a more extended TPB framework since it illustrates how background experiences influence intentions. In this model, ACE is conceptualised as mediating the relationship between TPB belief components (attitudes, norms and perceived behavioural control) and substance use intention.

Research indicates that exposure to traumatic experiences before the age of 11 years increases adolescents' likelihood of using cannabis, cocaine, prescription medicine, and other drugs (Carliner et al., 2016). Childhood traumatic experiences range from emotional and physical neglect to experiences of physical, emotional, and sexual abuse, and prevalence varies across the world, with North and South American countries ranking the highest (Zhang et al., 2020). In non-Western countries like China, childhood maltreatment has also been positively associated with non-medical prescription opioid use (Lei et

al., 2018). Other indicators of adverse childhood experiences include parental separation or divorce, domestic violence, household mental illness, family member imprisonment, and household substance abuse (Baglivio & Epps, 2014).

For many adolescents who have experienced childhood trauma, substance use may function as a maladaptive coping strategy for managing distress. Previous studies suggest that stress exposure is associated with greater substance use risk among adolescents, while trauma-exposed individuals may report using substances to temporarily reduce stress or avoid uncomfortable feelings (Charles et al., 2017; Froelich et al., 2022). In addition, adverse childhood experiences, including physical and emotional abuse, sexual abuse, neglect, and household substance abuse have been positively associated with adolescent substance use and later substance use severity (Halpern et al., 2018; Kobulsky et al., 2018; Usher et al., 2015). Therefore, we hypothesise.

H5a. Adverse childhood experiences will mediate the relationship between attitude and substance abuse intention.

H5b. Adverse childhood experiences will mediate the relationship between subjective norms and substance abuse intention.

H5c. Adverse childhood experiences will mediate the relationship between PBC and substance abuse intention.

H5d. Adverse childhood experiences will mediate the relationship between knowledge of substance use and substance abuse intention.

Moderating Role of Sensation Seeking

It is also possible to include moderators in the extended TPB models since individuals differ in the strength of the link between beliefs and intention. Moderation is used when a factor changes the strength of a relationship, and statistical methods may be used to test moderators along with mediators to better understand behaviour (Hayes, 2022). Personality traits are strong candidates for this role because they influence adolescents' responses to rewards, risks, and social circumstances. Research evidence shows that not all adolescents make rational decisions; some are more impulsive, and individual differences can help explain these variations (Maslowsky et al., 2019). Sensation seeking, i.e. preference for new and exciting experiences, is one such trait. It is closely associated with risky behaviour and reward-oriented decision making which may enhance the impact of favourable attitudes on intention (Maslowsky et al., 2019; Romer et al., 2017; Zuckerman, 2007). Studies building on TPB also demonstrate that personality traits can affect its pathways, which justifies adding them as moderators (Van Le et al., 2023).

Taken together, the suggested model is theoretically sound as it retains the core TPB framework but situates it within a broader developmental and personality framework. According to developmental

theory, early adversity may result in later risk through psychological mechanisms (Cicchetti, 2016), and studies indicate that these effects are typically indirect rather than direct (Wang et al., 2025). At the same time, individual differences help explain why certain adolescents act more strongly on their beliefs than others, which reinforces the moderating role of sensation seeking (Hayes, 2022; Maslowsky et al., 2019; Zuckerman, 2007). The integration of these ideas aligns with the existing studies showing that multi-factor models that include beliefs, life experiences, and personality are most appropriate for explaining adolescent risk intentions (Bozzini et al., 2020; Jia et al., 2021; Romer et al., 2017; Van Le et al., 2023).

Sensation seeking refers to an individual's propensity to seek novel, intense, and risky experiences (Arnett, 1994). For adolescents and adults alike, sensation seeking is a basic psychological need and a significant predictor of intrinsic motivation (González-Cutre et al., 2016). Sensation seeking may be especially salient during adolescence and emerging adulthood, as this developmental period is often characterised by identity exploration, instability, self-focus, and experimentation, all which may increase openness to substance-related risk-taking (Arnett, 2005). Consistent with this view, earlier research found that the sensation seeking was linked to alcohol and marijuana use during adolescence (Bates et al., 1986). Prior research shows that positive disposition towards alcohol and cannabis use in early adolescence has been associated

with higher sensation seeking (LaSpada et al., 2020). In addition, youth exposed to substance-using family environments may be more vulnerable to later substance-related problems, although Straussner and Fewell (2011). Is better suited as a broad background source than as direct evidence for positive attitudes towards substance use. Meldrum et al. (2022) found that greater exposure to adverse childhood experiences was associated with developmental patterns marked by lower impulse control and higher sensation seeking, which in turn were linked to greater delinquency. Based on this, the following hypothesis is proposed:

H6a. Sensation seeking is associated with intention to abuse substances among adolescents in at-risk communities.

H6b. Sensation seeking will moderate the relationship between attitude and substance abuse intention among adolescents in at-risk communities.

METHODOLOGY

Participants

The population of the study consists of adolescents living in high-risk drug use areas, as well as in hotspot areas identified by the NADA. Approximately 9,939,491 individuals reside in 155 high-risk areas (NADA, 2020). According to the United Nations Population Fund (UNFPA, 2020), individuals aged 10 to 19 years represent approximately 15% of the total population,

corresponding to 1,490,923 individuals in the targeted areas. To determine an appropriate sample size, this study employed Cochran's formula, using a 95% confidence interval and a $\pm 5\%$ margin of error as recommended by Chaokromthong and Sintao (2021) and Cochran (1977). The minimum required sample size for this study is 385 respondents. To ensure greater reliability and account for potential non-responses or incomplete questionnaires, the sample size was rounded up to 400 respondents.

Sampling Procedure

This study employed multistage sampling, beginning with the selection of areas based on four zones (northern region, central region, east coast, and southern region) in Peninsular Malaysia, using simple random sampling from a list of high-risk drug areas. Four states (Kedah, Kelantan, Johor, and Selangor) were randomly chosen from these zones, representing each country's geographic regions. Afterwards, researchers selected the location based on a list of high-risk drug areas. Two districts were selected for each state. Adolescents 18 years old or younger living at high risk met the inclusion criteria as respondents. Data collection was conducted with the approval of the Ethics Committee for Research Involving Human Subjects at Universiti Putra Malaysia (reference no: JKEUPM-2022-969). The process involved various approaches within the community. For residential areas, researchers and enumerators sought permission from the

village or residential area chief to inform them about the research. They requested their assistance in disseminating information to residents. In public areas, such as residential parks or other public spaces, researchers obtained consent from the parents or guardians of adolescent respondents. For respondents without immediate parental or guardian presence, researchers distributed questionnaires to selected adolescents, requesting them to take the forms home, obtain parental or guardian consent, and return the completed questionnaires the next day. A trained enumerator worked with the researcher to collect the data, assess the respondents' reading ability in Malay, and explain the questionnaire content to prevent misinterpretation.

Measures

Consistent with TPB and additional constructs, eight independent variables were included in the survey: attitude towards substance use, subjective norms, perceived behavioural control, adverse childhood experiences, sensation seeking, and knowledge. The dependent variable was substance use intention in the future. All variables were measured using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Substance abuse intention was assessed using a 9-point scale by adopting items from scholars (Ajzen, 2006; Bait Ajzoon, 2017; Cabral, 2022; Ma et al., 2018). A higher score indicated a stronger intention to use substances in the future. Examples of items in this instrument are "I intend to smoke a cigarette", "If it is allowed

by law, I will use kratom, " etc. Attitudes towards substance use were assessed using an 11-item inventory adapted from Ajzen (2006), Bait Ajzoon (2017), and Fok & Tsang (2). A higher score indicated a positive evaluation of substance use—examples of these items included: 'For me, people who vape look cool'; 'Everyone who tries drugs will eventually regret it'. Subjective Norm was measured with 12 items (Ajzen, 2006; Mereish et al., 2017; Zaleski & Aloise-Young, 2013). Higher scores indicate high social approval for substance use, for instance, 'my friends feel it's not wrong if I smoke', 'my parents forbade me to vape', and 'there's someone close to me drinking wine/beer in front of me'. PBC was measured using an eight-item inventory (Ajzen, 2006; Tavousi et al., 2009). Higher scores indicate that respondents perceive greater ease or difficulty in performing the behaviour and demonstrate more confidence in their ability to resist substance use under challenging situations, items such as 'getting a vape in my area is easy if I want'; 'taking prohibited substances, e.g. kratom/marijuana/shabu or not, it's up to me'), Substance use knowledge was assessing respondents' understanding of substance user symptom and substance use harmfulness with 20 items inventory. This measure was developed by adapting information from NADA on the symptoms of substance use and its harmfulness (Gaiha et al., 2021). ACE is measured by 13 items adapted from a previous study (Felitti et al., 1998). with items such as "I live in an unsafe environment", "I often do not have enough food to eat", and "I have

experienced abuse from a family member." "Higher scores indicate adolescents experienced house challenges, neglect, and abuse. Sensation seeking was measured by an 8-item inventory adapted from The Brief Sensation Seeking Scale (BSSS) (Stephenson et al., 2003) with items such as "I enjoy travelling without planning", "I enjoy doing thrilling activities", and "I seek new and exciting experiences, even if it means breaking the rules". A higher score indicates a high tendency to pursue new and different sensations, feelings, and experiences in risky activity. Additionally, the substance use behaviour of the respondent is measured by items which include the first experience with substance use, whether it was voluntary, forced, or influenced by friends, and how many of their friends were involved in these behaviours. For example: "my first experience with smoking was..." and "number of friends who use drugs: ...".

ANALYSIS

Demographic Analysis

Phase 2 data collection was conducted after the data analysis of the EFA with updated measures. The sample comprises 400 respondents (54.8%) identified as female, while 181 (45.3%) identified as male. As shown in Table 1, the respondents ranged from 13 to 18 years, with a mean age of 15.99 years (SD = 1.672). The sample population is predominantly Malay, with 341 respondents (85.3%) identifying as such. The Chinese ethnic group constitutes the

Table 1
Respondent's background

Variable	Frequency= n (%)
Gender	
Male/ boy	181 (45.3%)
Female/girl	219 (54.8%)
Age (in years)	
13-15	159 (39.8%)
16-18	241 (60.2%)
Mean = 15.99, SD. =1.672, Min = 13, Max = 18	
Ethnicity	
Malay	341 (85.3%)
Chinese	48 (12.0%)
Indian	7 (1.8%)
Bumiputera Sabah and Sarawak	2 (0.5%)
Others	2 (0.6%)
Education level	
Form 1- Form 5	266 (66.4%)
Drop out and enrol in vocational college	99 (24.8%)
Completed secondary education	34 (8.5%)
Drop out	1 (0.3%)
Parent marital status	
Married/living together	339 (84.0%)
Divorce/separated	29 (7.8%)
Widowed	32 (8.1%)

second largest category, with 48 respondents (12.0%). Other ethnic groups include Indian (7 respondents, 1.8%), Bumiputera Sabah and Sarawak (2 respondents, 0.5%), and others (2 respondents, 0.6%). This distribution highlights a significant majority of Malay respondents, reflecting the ethnic composition of the broader population. The educational background of respondents varies, with the majority currently enrolled in secondary education. Specifically, 266 respondents (66.4%) attended form 1 to form 5. Vocational school students constitute 24.8% of the sample (99 respondents). A

smaller portion of the sample has completed secondary education (34 respondents, 8.5%), and only one respondent (0.3%) has dropped out. This distribution emphasises a strong engagement in formal education among the respondents. Most respondents come from households where parents are married or living together, comprising 339 respondents (84.0%). Households with divorced or separated parents account for 7.8% (29 respondents), and those with widowed parents make up 8.1% (32 respondents). This data indicates that a significant majority of the respondents

experience family structures with married or cohabitating parents.

The data from Table 2 indicate the type of substance used among respondents. Electric cigarette/vape use is the most common, followed by cigarette smoking, alcohol consumption, and lastly, illicit drug use. Specifically, 20.3% of respondents have used electric cigarettes/vapes, 15.3% have smoked cigarettes, 10.0% have consumed alcohol, and only 2.3% have used illicit drugs. The high prevalence of non-users across all categories suggests that while some experimentation or use of substances exists, it is not widespread among the respondents.

The analysis reveals that 28.0% (n = 112) of the respondents have experimented with at least one type of substance. This indicates that over a quarter of the

respondents have engaged in some form of substance use, whether it be cigarettes, electronic cigarettes/vapes, alcohol, or illicit drugs. Conversely, 72.0% (n = 288) of respondents are classified as non-experimenters, meaning they have not tried any of the listed substances. The majority suggests a general trend of abstinence from substance use among the respondents.

Table 3 and 4 revealed that 28% of the study participants had at least tried one type of substance. There was a significant difference in mean substance use intention between substance experimenters and non-experimenters, $(152.171) = 5.360, p < 0.001, d = .704$. The average substance use intention score for non-experimenters was 1.2167, lower than the average substance use intention score for substance experimenters (1.5794).

Table 2
Lifetime substance-use experience by substance type among respondents

Variable	Frequency= n (%)
Cigarette	
Yes	61(15.3%)
No	339 (84.8%)
Electric cigarette/ vape	
Yes	81 (20.3%)
No	319 (97.0%)
Alcohol	
Yes	40 (10.0%)
No	357 (89.3%)
Missing	3 (0.8%)
Illicit drug	
Yes	9 (2.3%)
No	387 (96.8%)
Missing	4 (1.0%)

Despite the complete sample consisting of 400 adolescents, only 112 respondents reported prior substance use. As the construct of intention is more significant and predictive for those with direct experience of the activity, a multivariate analysis using Partial Least Squares Structural Equation Modelling (PLS-SEM) was performed solely on this subgroup. This approach enables a concentrated analysis of the psychosocial factors affecting the intention to maintain interest in substance use among those who have a history of such behaviour.

Analysis

The current study's model was validated using partial least squares structural equation modelling (PLS-SEM) version 3.2.8 software. A bootstrapping procedure comprising 5000 subsamples was carried out in the validation process, and all constructs

were measured reflectively. The effects of attitude, subjective norms, perceived behavioural control, and knowledge of substance use, and the mediating role of adverse childhood experiences, were concurrently examined, while the moderating role of sensation seeking in the attitude-substance abuse intention relationship was examined using the product indicator moderation method. The mean effect was statistically significant at ($p < .05$) as the confidence interval did not include zero.

Preliminary Analysis.

The study employed a measurement model in its analysis framework, necessitating the examination of convergent and discriminant validity, as well as the reliability of measurements at the scale level. In line with work by Hair et al. (2019), the first

Table 3
Substance experimentation status

Variable	Frequency= n (%)
Substance experimenters	112 (28.0%)
Non-experimenters	288 (72.0%)

Table 4
Differences between substance use intention scores between substance experimenters and non-experimenters

	Substance experimenters (n=112)		Non-experimenters (n=288)		Df	t	p	Cohen's d
	M	SD	M	SD				
SUI	1.5794	0.65985	1.2167	0.44643	152.171	-5.360	<0.001	-0.704

measure of the reflective PLS-SEM models is indicator loadings and internal consistency reliability. The authors indicate that the loadings should exceed 0.5, and the composite reliability should be regarded as good at a point between 0.70 and 0.90. The findings of the present study establish that all the indicators have loadings greater than 0.50, and the composite reliability ranges from 0.78 to 0.91, including subjective norms, sensation seeking, and substance abuse intention.

After establishing internal reliability, convergent and discriminant validity were assessed. Convergent validity was evaluated using Average Variance Extracted (AVE), with all constructs exceeding the 0.50 threshold, indicating satisfactory results (Hair et al., 2017). Discriminant validity was examined using the Fornell and Larcke (1981), and Henseler et al. (2015) methods. According to Fornell and Larcker, each construct's AVE square root should be greater than its inter-construct correlations. As shown in Table 5, this requirement was met, confirming that the constructs in this study possess adequate discriminant validity.

According to Hair et al. (2019), acceptable values for HTMT for conceptually different constructs should not exceed 0.85, while values for conceptually similar constructs should not exceed 0.90. The results, as shown in Table 5, reveal that the values of HTMT for all constructs in the study's model do not exceed the acceptable threshold.

RESULTS

Structural Model

Findings from the bootstrapping analysis conducted to assess the substance abuse intention model revealed that three of the five direct hypotheses tested in the study were supported by significant associations at the $p = 0.05$ level (Table 3). Attitude was found to be a significant and positive predictor of substance abuse intention ($\beta = 0.251$, $t = 3.2$, $SD = 0.079$, $f^2 = 0.114$, $p = 0.001$). This suggests that hypothesis H₁ is supported. In contrast, the results did not find a significant effect of perceived behavioural control ($\beta = -0.208$, $t = 1.026$, $SD = 0.094$, $f^2 = 0.019$, $p = 0.305$) and knowledge of the substance use ($\beta = -0.174$, $t = 1.731$, $SD = 0.101$, $f^2 = 0.051$, $p = 0.084$). Therefore, hypotheses H₂ and H₄ were rejected.

The results, as shown in Table 6, reveal that subjective norms were significantly and positively associated with substance abuse intention ($\beta = 0.198$, $t = 2.727$, $SD = 0.073$, $f^2 = 0.074$, $p = 0.006$). Consequently, this confirms hypothesis H₃. Also, the path coefficient of sensation seeking was significantly associated with substance abuse intention ($\beta = -0.208$, $t = 2.662$, $SD = 0.078$, $f^2 = 0.096$, $p = 0.008$). Therefore, hypothesis H_{6a} is supported.

Mediating Role of Adverse Childhood Experiences

As Table 7 reveals, the relationship between attitude and substance abuse intention was significant in the direct model. However,

Table 5
Measurement model (discriminant validity)

Constructs	Fornell-Lacker Criterion							HTMT										
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	α	rho_A	CR	AVE
1 ACE	0.72														0.87	0.90	0.89	0.527
2 A	0.21	0.72					0.23								0.72	0.85	0.81	0.524
3 SAI	0.43	0.50	0.76				0.44	0.55							0.89	0.89	0.91	0.588
4 PBC	-0.16	-0.07	-0.16	0.72			0.19	0.29	0.19						0.85	0.79	0.85	0.527
5 SS	0.17	0.03	-0.19	0.14	0.75		0.33	0.25	0.19	0.23					0.9	1.05	0.91	0.567
6 SN	0.25	0.25	0.41	0.12	0.03	0.74	0.31	0.36	0.53	0.43	0.19				0.61	0.57	0.78	0.55
7 KSU	-0.13	-0.22	-0.45	0.13	0.15	-0.15	0.77	0.17	0.23	0.47	0.15	0.17	0.28		0.89	0.94	0.92	0.599

Table 6
Structural model result

H	IV	DV	Path Coefficient	Critical Ratio	Significance	Conclusion
H1	A	SAI	0.251	3.2	0.001	Significant
H2	PBC	SAI	-0.208	1.026	0.305	Not significant
H3	SN	SAI	0.198	2.727	0.006	Significant
H4	KSU	SAI	-0.174	1.731	0.084	Not significant
H6a	SS	SAI	-0.208	2.662	0.008	Significant

Table 7
Mediation result

H	Path Direction	β	P	95% CI Bootstrap BC	LB	UB
H5a	A→ACE→SAI	0.049	0.161	-0.014	-0.014	0.122
H5c	PBC→ACE→SAI	-0.065	0.397	-0.171	-0.171	0.134
H5b	SN→ACE→SAI	0.087	0.045	0.019	0.019	0.186
H5d	KSU→ACE→SAI	-0.016	0.751	-0.119	-0.119	0.074

in the presence of adverse childhood experiences, the relationship between attitude and substance abuse intention was insignificant ($\beta = 0.049$, $t = 1.401$, $p = 0.161$). Additionally, in the direct model, the effect of perceived behavioural control on substance abuse intention was not significant, and when controlling for adverse childhood experiences, the relationship remained insignificant ($\beta = -0.065$, $t = 0.847$, $p = 0.397$). However, the size of the standard coefficient decreased. This suggests that adverse childhood experiences did not mediate the relationship between both attitude and perceived behavioural control and substance abuse intention. Therefore, hypotheses H_{5a} and H_{5c} are not supported.

Subjective norm had a significant and positive association with substance abuse intention in the direct model. A became significant. Additionally, the inclusion of adverse childhood experiences also yielded a significant relationship ($\beta = 0.087$, $t = 2.002$, $p = 0.045$). Thus, adverse childhood experiences partially mediate the relationship between subjective norms and substance abuse intention, and hypothesis H_{5b} is supported. The result shows that adverse childhood experiences did not mediate the relationship between knowledge of substance use and substance abuse intention ($\beta = -0.016$, $t = 0.318$, $p = 0.751$); therefore, hypothesis H_{5d} is not supported. With adverse childhood experiences included as a mediator in the model, R^2 values for adverse childhood experiences and substance abuse intention were 0.126 and 0.596, respectively.

Moderating Role of Sensation Seeking

The results of the moderation analysis revealed a significant relationship between attitude and substance abuse intention ($\beta = 0.251$, $t = 3.2$, $p = 0.001$) and a significant association between sensation seeking and substance abuse intention ($\beta = -0.208$, $t = 2.662$, $p = 0.008$). The interaction effect of attitude and sensation seeking had a significant association with substance abuse intention ($\beta = -0.152$, $t = 1.979$, $p = 0.048$). Therefore, sensation seeking played a moderating role in the relationship between attitude and substance abuse intention, and hypothesis H_{6b} is supported.

DISCUSSION

The primary aim of this study was to identify the determinants of substance abuse intention and to examine the moderating role of sensation seeking and the mediating role of adverse childhood experiences (ACEs) among adolescents residing in at-risk communities in Peninsular Malaysia. The results indicate that attitude, subjective norms, and sensation seeking are the most significant direct predictors of substance abuse intention. The influence of attitude aligns with previous findings by Donaldson et al. (2016), Garcia-Cerde et al. (2021), and Mao et al. (2009), who reported that a favourable attitude towards substance use is associated with increased use of cigarettes, prescription stimulants, and other drugs among adolescents and young adults. This suggests that adolescents in high-risk settings may have become desensitised

to the risks of substance use, potentially due to its normalisation within their social environment. A pro-substance attitude may also be reinforced by perceived benefits of substance use, which are often culturally or socially embedded.

The findings of this study also reveal that subjective norms are positively associated with adolescents' substance abuse intention, confirming findings of (Shafiq et al., 2006; Visser et al., 2013) that peer influence is the leading determinant of alcohol and substance abuse during adolescence. Our finding also echoes those of (Macdonald & Howard, 2020; Melkman, 2015) that peer and deviant peer influence are pivotal to substance abuse patterns of at-risk youths. Findings also suggest that if adolescents in at-risk communities consider substance abuse as socially acceptable, it may increase their intention to abuse substances because of their desire for approval and social acceptance. Given the increased prevalence of social media use among adolescents, peers may also increase adolescents' risk of substance abuse through interaction on social media. (Yoo et al., 2016) found that exposure to pro-smoking messages on social media amplifies and reinforces smoking norms among young people, while also increasing their smoking intentions.

Our finding on the significant effects of sensation seeking was significant but surprisingly negative. Suggesting that low sensation seeking is associated with the substance abuse intention of at-risk adolescents. This is in contrast with previous studies (Charles et al., 2017; Kamel et al.,

2021; LaSpada et al., 2020; Melkman, 2015), which finds an association between high sensation seeking and increased likelihood of substance abuse. Likely reasons for our unconventional finding are that low sensation-seeking adolescents in at-risk communities may still experience significant emotional and psychological stressors, and may require support, the lack of which may increase their substance use intention. For these adolescents, increased substance abuse intention may not be a result of the thrill, adventure and novelty associated with sensation seeking; however, low sensation seekers may be inclined to abuse substances as a result of a lack of parental support, which may increase anxiety and depression and their chances of substance abuse (Fröjd et al., 2007; Lai et al., 2015; Rioux et al., 2019).

However, findings from the study showed that perceived behavioural control exerts an insignificant effect on substance abuse intention. Likely reasons for this are that, as research suggests, although abusers control beliefs over consuming substances may be high, their beliefs over obtaining those substances may be limited (Orbell et al., 2001). Consequently, findings from this study contradict previous research (Huang et al., 2014), which finds perceived behavioural control to be a leading factor in substance abuse intention of adolescents in at-risk communities. This study also found that knowledge of substance use did not exert a significant effect on substance abuse intention. This finding contradicts previous studies (Harrison et al., 2024), which finds

that an increase in knowledge of substances is associated with reduced current use and intention to use.

When considering the mediating role of adverse childhood experiences, this study finds that adverse childhood experiences partially mediate the relationship between subjective norms and substance abuse intention. This implies that adverse childhood experiences can shape how adolescents in at-risk communities perceive and internalise societal expectations about substance abuse. This finding is consistent with previous studies (Maiya et al., 2023; Usher et al., 2015), which find that childhood trauma can normalise substance abuse, particularly for adolescents whose immediate family members are substance abusers. This study's findings also suggest that adolescents who consider substance abuse as a coping mechanism are more likely to abuse substances themselves. This is consistent with previous studies (Cabanis et al., 2021; Costanzo et al., 2023). Substance abuse can be a buffer for distressing emotions for children who have undergone developmental trauma, helping them distance themselves from associated painful memories.

CONCLUSION

The findings support the hypothesis that sensation seeking moderates the effects of attitude on substance abuse intention. Specifically, the negative coefficient beta observed indicates that lower levels of sensation seeking weaken the positive influence of attitude on the intention to use

substances. In other words, adolescents with low sensation-seeking tendencies are less likely to form favourable attitudes towards substance use, which in turn diminishes their intention to engage in such behaviour. This finding aligns with previous studies suggesting that low sensation seekers generally exhibit less favourable attitudes towards substance use and are at lower risk of engaging in it (Everett & Palmgreen, 1995; Palmgreen et al., 2001). However, the current findings diverge from those of Puente et al. (2008), who reported that sensation seeking amplifies the association between attitude and substance use, suggesting that this relationship may be context-dependent and influenced by environmental or cultural factors specific to the adolescent population under study.

Contributions of the Study

Overall, this study contributes to the theory of planned behaviour by incorporating knowledge of substance use and sensation-seeking as complementary predictors, sensation-seeking as a moderator, and adverse childhood experiences as a mediator, thereby extending the pertinency of TPB to studies of public health issues and high-priority populations. The findings demonstrate that, compared to attitude, subjective norms, and sensation-seeking, knowledge of substance use and perceived behavioural control are less influential determinants of substance abuse intention of at-risk adolescents. The finding on the mediating role of adverse childhood experiences demonstrates how developmental adversities open a

pathway through which risky normative beliefs can influence intention formation to abuse substances. Suggesting that adverse childhood experiences can increase adolescents' susceptibility to misconceptions coming from peers about the benefits of using substances.

Theoretical Implications of the Study

This study's findings validate the core assumptions of the TPB, which suggest that attitude and subjective norms are essential predictors of behavioural intention, while perceived behavioural control is not. The significant effect of sensation seeking on intention suggests that including relevant dispositional constructs in the TPB is crucial when researching risky behaviours. The mediating role of adverse childhood experiences suggests that subjective norm, as a TPB construct, is less contemporaneous, linking it to developmental history. Finally, the moderating effect of sensation seeking indicates that the relationship between attitude and intention to abuse substances is not uniform for all at-risk adolescents but may depend on individual characteristics. It also suggests that attitude may be a more potent motivator to abuse substances for at-risk adolescents who are less prompted by sensation-seeking.

Practical Implications of the Study

The findings of the study offer guidance for designing preventive and curative substance abuse interventions for adolescents. The

significant positive effect of attitude on substance abuse intention suggests that targeted preventive interventions should focus on debunking the beliefs at-risk adolescents have about the incentives associated with using substances while emphasising the associated health and legal risks. Alternative coping mechanisms for stress associated with adverse childhood experiences should be incorporated into curative interventions. Similarly, the positive effects of subjective norms suggest that curative interventions should incorporate normative re-education comprising peer-based education and mentorship into campaigns against adolescent substance abuse while disproving the misconceptions of the social acceptability and prevalence of substance use in high-risk and general populations. Lastly, interventions may include assessments to identify at-risk adolescents' levels of developmental psychopathology and sensation-seeking for more personalised interventions.

Ethics Review Board Clearance

This study complied with the ethical guidelines and was approved by the Universiti Putra Malaysia Ethics Committee (reference number JKEUPM-2022-969).

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