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Development and validation of the entrepreneur hardiness scale for immigrant entrepreneurs in the UAE: a comprehensive study

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Abstract

This study introduces the Entrepreneur Hardiness Scale (EHS), tailored to evaluate the hardiness of immigrant entrepreneurs in the United Arab Emirates (UAE). It derives from an analysis of three crucial traits – commitment, challenge, and control and their underlying eighteen categories of variables. The effectiveness of the EHS as an assessment tool for immigrant entrepreneurs in the UAE is emphasized. Structural Equation Modeling (SEM), along with Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), is employed in a multi-step approach to develop and validate the EHS. This process includes the analysis of three cross-sectional samples across five studies. The psychometric properties of the scale are thoroughly examined. The initial item pool of 35 items undergoes expert evaluation, resulting in the selection of 18 items through exploratory factor analysis and item analysis with 360 participants. Reliability and convergent validity are established using Cronbach's alpha and correlation with the Dispositional Resilience Scale in a sample of 1273 participants. The three-factor model of the EHS proves beneficial for entrepreneurs, especially in the Middle East, aiding them in focusing their entrepreneurial executions on commitment, challenge, and control. While rooted in interpersonal traits, this model utilizes a data reduction technique (three-factor model/18-factor loading) for better comprehension. By examining the entrepreneurial traits of immigrlant entrepreneurs, the study sheds light on the UAE's broader support for entrepreneurship. The study furnishes insights from the EHS for entrepreneurs of diverse backgrounds, facilitating their engagement in various business ventures and identifying strategic opportunities in foreign markets. It aims to inspire and motivate emerging entrepreneurs with immigrant backgrounds, particularly in the Middle East, contributing a valuable instrument for understanding and supporting the resilience of entrepreneurial populations in multicultural contexts. The EHS-18 exhibits robust psychometric properties, making it suitable for assessing hardiness among immigrant entrepreneurs in the UAE. CFA confirms the theoretical sensitivity of the three-dimensional structure of the scale, comprising commitment, control, and challenge dimensions.

Keywords Hardiness · Commitment · Control · Challenge · Entrepreneur · Factor analysis · Structural equation modeling

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Introduction

Hardiness stands as a key facet in positive psychology, potentially shaping personality development and quality of life. It denotes an individual's capacity to confront and overcome stressors and challenges (Jianping et al., 2023; Tantry & Singh, 2016). As defined by Maddi (1990), hardiness encompasses a set of cognitive styles determining how individuals perceive and respond to critical incidents or stressors. These styles include commitment, reflecting the inclination to find purpose in difficult situations; control, indicating the belief in managing stressful events; and challenge, representing the tendency to view stressors as avenues for personal growth (Shepperd & Kashani, 1991; Maddi, 1990 as cited in Rybakovaitė et al., 2021).

Various research outcomes underscore the positive correlation between hardiness and mental well-being (Bartone & Bowles, 2021; Mazzetti et al., 2019). Recent studies reveal that individuals exhibiting high levels of commitment, control, and challenge are inclined towards active coping strategies rather than avoidance mechanisms. They demonstrate commitment to civic duties and possess confidence in navigating mandatory military service (commitment); moreover, they perceive the stress inherent in such service as an opportunity for personal and professional advancement (challenge). Additionally, resilient individuals exhibit a penchant for exploration and self-discovery, regarding change as advantageous. They tend to be deeply engaged in their pursuits (Mazzetti et al., 2019), displaying proactive coping mechanisms and utilizing available resources to tackle disturbances as they arise (Rybakovait et al., 2021). Theoretically, resilient individuals experience similar circumstances to their less resilient counterparts but maintain a more positive outlook, perceiving their situations as less stressful and possessing confidence in their coping abilities. The three facets of hardiness synergize to foster a resilient mindset adept at navigating stressful conditions effectively (Bartone et al., 2023).

Entrepreneurship epitomizes the process of initiating and establishing a business venture. It encompasses the conception and development of new concepts, products, services, enterprises, or activities (Hayes, 2021). An entrepreneur, by definition, is an individual who takes the initiative to establish a new business venture, assuming both the risks and potential rewards associated with it. The indispensable role of entrepreneurs in any economy lies in their ability to identify emerging needs and transform innovative ideas into commercial realities (Hayes, 2021). Successful entrepreneurship, marked by the willingness to undertake business risks, is rewarded with financial gains, recognition, and avenues for further growth, while failure can lead to financial losses and a diminished market presence.

Given the significant impact of entrepreneurship on employment, innovation, and societal stability, policymakers prioritize its promotion alongside Small and Medium Enterprises (SMEs) within the economy (Alibhai et al., 2017). Governments worldwide recognize the pivotal role of fostering an entrepreneurial culture and fostering innovation within SMEs to enhance their global competitiveness. Indeed, SMEs constitute the backbone of many economies worldwide, representing over 95% of registered businesses, employing approximately 50% of the workforce, and contributing more than 35% to GDP in numerous emerging regions (Alibhai et al., 2017).

In recent times, driven by the imperative for economic diversification, the government of UAE has acknowledged the multiplier impact of SMEs and initiated programs aimed at bolstering the sector's capabilities, particularly innovation fostering (Issac, 2024). The Vision 2021 of UAE sets ambitious targets to elevate SMEs' contribution to GDP to 70%. Notably, findings from a survey conducted in the MENA region reveal that for every ten successful new SMEs established, approximately $1.5 billion in current valuations and over 2,500 job opportunities are generated (Alkasmi et al., 2018). Entrepreneurship stands recognized as a crucial driver of innovation, employment generation, and economic prosperity, thereby enhancing overall societal well-being.

Immigrant entrepreneurship refers to the establishment of businesses by immigrants in their host countries (Aaltonen & Akola, 2014). One of the central theories underpinning immigrant entrepreneurship is the Disadvantage Theory proposed by Light (1979), which suggests that immigrants often face challenges in securing employment due to factors such as xenophobia, language barriers, and cultural differences, leading them to pursue entrepreneurship as a means of survival (Fatoki, 2019). Immigrant entrepreneurs play a vital role in job creation, poverty alleviation, and economic growth within their host nations. However, they also encounter significant obstacles, including limited access to funding, inadequate infrastructure, managerial skills shortages, discrimination, and competition from native business owners (Ngota et al., 2018).

The pursuit of entrepreneurship amidst these challenges exposes immigrant entrepreneurs to considerable stress, commonly referred to as entrepreneurial stress, which encompasses work-related stressors unique to business owners (Fatoki, 2019). Unlike other individuals, entrepreneurs often find it challenging to detach from work due to their financial and emotional investment in their ventures (White & Gupta, 2020). This stress can lead to severe mental and emotional issues such as burnout, interpersonal difficulties, and diminished well-being (Fatoki, 2019). Moreover, research has linked low levels of hardiness, a concept

encompassing resilience and coping abilities, to avoidance coping strategies and several mental health issues, including anxiety, depression, and stress vulnerability (Bartone & Bowles, 2021).

The Dispositional Resilience Scale (DRS) is commonly used to assess hardiness, yet it has limitations, including low subscale reliability and limited construct validity (Bartone et al., 2023). Additionally, no specific scale exists to assess immigrant entrepreneurial hardiness. Therefore, this study aims to develop and evaluate the psychometric properties of a reliable measure of immigrant entrepreneurial hardiness.

The unique challenges faced by immigrant entrepreneurs in the UAE

One significant regulatory constraint faced by immigrant entrepreneurs in the UAE is the requirement that international investors conducting business in the mainland must form a partnership with a local UAE national or UAE-owned firm, which holds 51% of the company's share capital. This arrangement often leaves immigrant investors with limited control over their business operations and exposes them to various risks and uncertainties (James et al., 2024).

There are still several unclear areas in the structure and legal-regulatory protections governing foreign-owned enterprises, despite their gradual improvement. For instance, local courts will only uphold the decisions of foreign courts in arbitrable situations if the requirements of the foreign law do not conflict with the UAE's Islamic Shari'a. The arbitrability of issues pertaining to real estate is another topic of debate (James et al., 2024).

Banks are highly cautious about funding immigrants because they lack the "control" that comes with having borrowers who are citizens of a country. This is because immigrants in the United Arab Emirates are temporary residents who are not permitted to obtain citizenship or permanent resident status, unlike those in other countries. Similarly, opening a bank account is a challenge for 50% of UAE business owners. This number is much higher than the 25% global average. The financing of SMEs by banks is also unclear and opaque, and there are no organizations such as the European Investment Advisory Hub or the Banque de France's well-established network of regional correspondents, which has about 100 advisors, that provide small local businesses with advice on new financial matters pertaining to their operations (James et al., 2024).

Banks require business borrowers to own physical offices registered in the name of their businesses and need them to pay huge security deposits to alleviate the potential risks of bad debts posed by transient immigrants. This, as several of them have turned out to be fly-by-night operators, with no strings attached to the country, due to their permanently impermanent (non-citizen) status (James et al., 2024).

With over 85% of the UAE's population being transient expatriates who can never aspire to be citizens or permanent residents (including the EEs themselves), the economy relies almost wholly on expatriate labour (Beyer, 2023), which can pose problems in case of changes in immigration policies, or in case of political or economic disturbances in the workers' parent countries.

Immigrants need to provide "employment visas" to their staff before they can begin work, as they are not citizens of the country, and are drawn from the expatriate pool (of over 85%). Immigrants in the UAE (and not the government) must provide health insurance to cover their employee's medical expenses (James et al., 2024).

Recent data indicate that approximately 85% of the UAE's population consists of expatriates (James et al., 2024), and nearly 60% of SMEs are owned and operated by immigrant entrepreneurs (Ameen & Anand, 2020). These businesses play a significant role in the UAE economy, contributing around 53% of the country's GDP. Immigrant entrepreneurs are particularly active in sectors such as convenient stores, real estate, education, health and beauty, highlighting their critical role in the nation's economic diversification and innovation strategy.

Therefore, this research aimed to develop and rigorously validate a robust tool specifically designed to measure entrepreneurial hardiness among immigrant-owned businesses in the UAE.

An overview of the hardiness measures

During the initial stages of exploring the concept of hardiness, measuring it posed significant challenges. Kobasa (1979) pioneered its analysis by amalgamating 18 psychological factors aimed at encompassing commitment, control, and challenge aspects. This initial inventory, comprising over 100 items, was subsequently condensed into various shorter versions (Ouellette, 1993). However, these iterations still exhibited notable flaws, as they predominantly comprised negative or "non-hardy" elements, allowing neuroticism to influence responses (e.g., "No matter how hard I try, my efforts will accomplish nothing"; Funk, 1992). Additionally, several studies failed to replicate the hypothesized three-dimension structure of hardiness, casting doubt on the validity of these measures (Funk, 1992). Subsequently, a briefer version of the hardiness measure, initially comprising 50 items and later refined to 45 items, known as the Dispositional Resilience Scale (DRS), was developed. Over time, the DRS underwent further modifications, resulting in

30-item and 15-item versions. The final iteration, the concise DRS-15, aimed to enhance scale reliabilities and mitigate linguistic biases in item phrasing (Bartone, 2013).

Despite its utility as a hardiness assessment tool, the DRS-15 exhibits notable limitations. Reliability coefficients for commitment, challenge, and control often fall below expected levels. For instance, in a sample of Norwegian naval cadets, reported coefficients were as low as 0.62 for challenge and 0.73 for commitment. Similarly, Cronbach's coefficients of 0.58, 0.67, and 0.67 for hardiness, commitment, control, respectively, and only 0.69 for the entire scale were reported in another study (Madrigal et al., 2016). Furthermore, the short 5-item scales of the DRS-15 may inadequately capture the multifaceted nature of hardiness facets, raising concerns about construct validity. Consequently, scale reliability remains a significant issue for the DRS-15 (Bartone et al., 2023).

To address these shortcomings, this study aims to develop a new, more reliable, and construct-valid hardiness measure tailored to the immigrant entrepreneur population in the UAE. The scale's construction is intended to facilitate research on hardiness and its applications within industrial and business contexts, improve the measurement of hardiness, both theoretically and practically, and potentially extend its applications to broader domains.

Sector-wise overview or research gap

There have been many studies on hardiness measures established in various sectors, target demographics, publication times, and nations, but none have focused on entrepreneurial hardiness. Because modern life relates to numerous rapid changes and stressful conditions, individuals at all stages of life, fields, and conditions, particularly entrepreneurs in today's dynamic global economy, must be able to build toughness to meet life's challenges. Scales for hardness were developed for different age groups, from children to the elderly.

Also, different circumstances were considered such as patients (Pollock & Duffy, 1990), general population (Bartone et al., 2023; Maddi et al., 2006; Funk & Houston, 1987), employees (Moreno-Jiménez et al., 2014), adolescents (Sujisha & Manikandan, 2018), athletes (YAMAGUCHI et al., 2020), students (Soheili et al., 2021; Cheng et al., 2019; Kamtsios & Karagiannopoulou, 2013), parents (Soheili et al., 2021), and family caregivers (Hosseini et al., 2022). As a result, eight scales were constructed for students; this could be as students are more likely to face stress and difficulty and have less time to acquire hardiness (Cheng et al., 2019). The most used scale is the Dispositional Resilience Scale (DRS-15).

The Personal Views Survey (PVS), PVS- II, III, and III-R, which have been translated and studied in many languages (Madrigal et al., 2016). The most recent scales were the "family caregivers' hardiness scale" for family caregivers of Alzheimer's patients (Hosseini et al., 2022) and the Hardiness Resilience Gauge (HRG) for assessing hardiness in adult populations (Bartone et al., 2023).

Kobasa classified the aspects of all scales into three themes: commitment, challenge, and control. The dimension of commitment relates to the tendency to be involved in the situation rather than isolated, and it explains variations ranging from 8.92 (Madrigal et al., 2016) to 38.91% (Kamtsios & Karagiannopoulou, 2013) in this research. The Control dimension refers to conviction in the efficacy of effort in producing results, even in stressful settings. According to several studies (YAMAGUCHI et al., 2020; Pollock & Duffy, 1990), this dimension accounts for most of the overall explained variance in hardiness.

The final factor is challenge, which refers to accepting life's obstacles as normal and attempting to turn them into learning experiences. This component also accounts for most of the overall explained variance in hardiness in certain studies (Madrigal et al., 2016; Moreno-Jiménez et al., 2014). The most dimension is related to Kamtsios et al., with nine components, six of which are related to commitment, two to challenging, and one to the control dimension. Factor extraction increases explained variance by categorizing items into a minimum number of components. Most research explained $\leq$50% of total variance, with a maximum of 68.9% for one research with two factors (Funk & Houston, 1987) and 65.75% for three factors (Soheili et al., 2021). Furthermore, the lowest variance explained by Pollok's study (32.1%) indicated two components that investigated the role of hardiness in an individual with a real health problem.

However, several studies did not explicitly describe key information on psychometric features, and the quality of newer articles was higher than that of previous ones. This could be attributed to the creation of writing guidelines by journals as well as new approaches for psychometric scale evaluation. Furthermore, most research neglected to address essential psychometric aspects (Hosseini et al., 2022). Despite these developments, there is still a significant gap in literature due to the lack of a comprehensive entrepreneur hardiness scale. Recently, Quiun et al. (2021) investigated the presence of burnout among entrepreneurs and the role of hardy personalities in this process. Work-related characteristics were revealed to be the most important predictors of burnout in entrepreneurs, and a hardy personality was found to mitigate these effects and thereby reverse the negative repercussions of burnout.

The findings highlight the necessity of assessing entrepreneurial hardiness and implementing training programs to foster hardy personality traits for better entrepreneur health and performance (Quiun et al., 2021). Given the importance of hardiness in business success, there was an obvious need to develop and validate a scale tailored to the entrepreneurial context. Such a scale would allow researchers and practitioners to gain a better understanding of the significance of hardiness in the entrepreneurial sphere, as well as design interventions aimed at enhancing entrepreneurial hardiness and performance.

This study sought to address this gap by developing and validating an entrepreneur hardiness measure, drawing on concepts from current hardiness measures and applying them to the entrepreneurial sector. Through rigorous psychometric evaluation and validation procedures, the proposed scale sought to provide a valuable tool for assessing and enhancing hardiness among entrepreneurs, contributing to the advancement of knowledge in the domain of entrepreneurship and hardiness.

While many tools assess hardiness broadly, they often lack specificity for entrepreneurial contexts and do not account for the unique challenges faced by immigrant entrepreneurs. These challenges include cultural and sector adaptation, directing regulatory frameworks in a foreign country, and overcoming migration-specific barriers to business success. Existing measures, therefore, may fail to capture the aspect of hardiness required in this sector and demographic, particularly within the UAE's diverse and competitive entrepreneurial ecosystem. An overview of these hardiness measures is presented in Table 1.

Methodologies and results

Drawing primarily from Kobasa's (1979) concept of hardiness, an initial pool of questionnaire items was created to represent the traditional dimensions of challenge, commitment, and control. To mitigate the introduction of construct-independent variance associated with complex response scales, a simple response scale ranging from 1 (strongly disagree) to 4 (strongly agree) was adopted. Some items were phrased negatively, denoted by 'R', and were reverse scored. Item refinement proceeded through two stages. Initially, eight subject matter experts assessed content validity (Jaafari et al., 2023) and reviewed the initial pool of 42 items. Responses were scored on a scale of 1 to 4: 1 = not relevant, 2 = unable to assess relevance without item revision, 3 = relevant but requires minor changes, and 4 = very relevant. Items rated 3 or 4 by experts were assigned a score of 1, while those rated between 1 and 3 were scored as 0. The Content Validity Index (CVI) was calculated using the formula proposed by Yusoff (2019). Thirty-five items were retained for further analysis, as the CVI exceeded 0.875 for these items, surpassing the recommended cutoff of 0.80 (Jaafari et al., 2023; Yusoff, 2019).

Summing up of studies and steps for methodologies and results

Study 1 involved item generation and content validity After thorough review of the literature items pool was generated and 8 subject experts were involved to establish the content validity of the tool. This step ensured that the items were relevant and adequately covered the construct of hardiness.

Study 2 established exploratory factor analysis (EFA) *Conducted with sample group 1 of 360 participants to perform an EFA. This method helped identify the underlying factor structure of the tool and refine the items based on factor loadings.*

Study 3 involved reliability and convergent validity Employed sample group 2 of 1273 respondents to evaluate the reliability of the tool using Cronbach's alpha, ensuring internal consistency. Additionally, this study assessed convergent validity to confirm that the tool correlates well with other measures that it theoretically should correlate with.

Study 4 conducted confirmatory factor analysis (CFA) *Used the same sample group 2 of 1273 participants to conduct a CFA. This step validated the factor structure identified in the EFA, confirming that the data fits the hypothesized model.*

Study 5 established criterion and discriminate validity Involved sample group 3 of 204 respondents to test criterion validity (concurrent validity) and discriminate validity. Criterion validity ensured that the tool accurately measures the hardiness construct in relation to other relevant criteria, while discriminate validity confirmed that the tool does not measure unrelated constructs.

Sample overview Participants were recruited through a multistage sampling approach. First, three emirates were randomly selected from the seven emirates of the UAE. Subsequently, SMEs within these selected emirates were mapped, and every fifth business unit was approached for participation in the study. Consent was obtained prior to data collection.

The socio-demographic characteristics of the participants reflect the diverse expatriate population of the UAE, including individuals from South Asia (India, Pakistan), the Far

Table 1 An overview of hardiness measures

Author(s)	Items	Dimensions	Population	Limitations
Kobasa (1979) Hardiness Scale	100	Commitment, Challenge, and Control	Ailing adult executives (40–50 years)	exhibited notable flaws, as it predominantly comprised negative or "non-hardy" elements, allowing neuroticism to influence responses (e.g., "No matter how hard I try, my efforts will accomplish nothing"; Funk, 1992)
Bartone et al. (1989) Dispositional Resilience Scale	50	Commitment, Challenge, and Control	Military	scale reliability remains a significant issue for the DRS-15 (Bartone et al., 2023)
Bartone (1995) (DRS-15)	15	Commitment, Challenge, and Control	Army Special Forces	Reliability coefficients for commitment, challenge, and control often fall below expected levels. For instance, in a sample of Norwegian naval cadets, reported coefficients were as low as 0.62 for challenge and 0.73 for commitment (Hystad et al., 2015). Similarly, Cronbach's coefficients of 0.58, 0.67, and 0.67 for hardiness, commitment, control, respectively, and only 0.69 for the entire scale were reported in another study (Madrigal et al., 2016); has several serious limitations, including low subscale reliability and limited construct validity (Bartone et al., 2023)
(Pollock & Duffy, 1990)	34	Commitment and Control	Patients (individuals with actual health problems)	Low reliability
(Jiménez et al., 2014. Occupational Hardiness Questionnaire	15	Commitment, Challenge, and Control	employees	Psychometric limitations, especially poor test-retest reliability of dimensions
(Sujisha & Manikandan, 2018)	22	unidimensional construct	Adolescents (Malayalam Language)	Psychometric limitations,
(YAMAGUCHI et al., 2020)	12	Commitment, Challenge, and Control	Japanese university athletes	Psychometric limitations
Soheili et al., 2021	20	Commitment, Challenge, and Control	Children	Poor psychometric properties
(Kamtsios & Karagiannopoulou, 2013)	36		late elementary school students	Psychometric limitations: e.g., the test–retest reliability for the nine factors was reported moderate e, g., coefficient of 0.61
(Soheili et al., 2021)	37	three-factor model (responsive interaction, empowering participation, and learning-oriented support)	Parents of children aged between 7–12 years	The results of the internal consistency of HBPBQ were good to excellent for the whole scale (Soheili et al., 2021)
(Hosseini et al., 2022)	21	five factors- religious coping, self-management, empathic communication, family affective commitment, and purposeful interaction	family caregivers of Alzheimer's patients	samples were recruited from Iranian populations.
(Bartone et al., 2023) the Hardiness Resilience Gauge (HRG)	28	Commitment, Challenge, and Control	adult populations	possesses excellent reliability and validity and appears to be a more effective tool for measuring hardiness in adult populations (Bartone et al., 2023)

Table 1 (continued)

Author(s)	Items	Dimensions	Population	Limitations
EHS-18	18	Commitment, Challenge, and Control	Immigrant Entrepreneurs	However, the quality of the more recent papers was higher than that of the earlier ones, and several research failed to clearly convey important information on psychometric traits. Journals' development of writing guidelines and novel methods for evaluating psychometric scales may be to blame for this. Additionally, some studies failed to address crucial psychometric elements (Hosseini et al., 2022). Despite these advancements, the absence of a thorough entrepreneur hardiness scale has left a sizable void in literature. The prevalence of burnout among entrepreneurs and the part that resilient personalities play in this process were recently examined by Quiun et al. (2021). The most significant predictors of burnout in entrepreneurs were found to be work-related traits, and a resilient personality was found to counteract these effects and reverse the detrimental consequences of burnout. The results emphasize that to improve the health and performance of entrepreneurs, it is essential to evaluate entrepreneurial hardiness and put in place training programs that cultivate hardy personality qualities (Quiun et al., 2021). It was clear that a measure specific to the entrepreneurial setting needed to be developed and validated, considering the significance of hardiness in business success. Researchers and practitioners could better understand the importance of hardiness in the entrepreneurial realm and create treatments to improve entrepreneurial performance and hardiness with the use of such a scale. The above discussed scales have strengths and some limitations; however, they are validated on different populations. There is no scale on hardiness for entrepreneur population. Therefore, this study aimed to address this gap by developing a hardiness measure specialized for entrepreneurs. EHS-18 has good psychometric properties.

East (China), the Middle East (Lebanon, Egypt), and Africa (Nigeria, South Africa). The businesses represented a variety of sectors, including education, health and beauty, entertainment, convenience stores, restaurants, and real estate.

Only businesses that had moved beyond the start-up phase and were operating in the profitability stage were included in the sample. Start-up phase businesses were excluded to ensure the study focused on entrepreneurial hardiness in established and profitable enterprises.

This research was reviewed and approved by an ethics review board of Fatima College of Health Sciences, Abu Dhabi prior to data collection, ensuring that all ethical guidelines and protocols were followed.

Item generation process and expert review criteria The item generation process involved a thorough review of existing hardiness scales and literature on entrepreneurial and immigrant hardiness. This review helped identify gaps and ensured relevance to the target population. To establish content validity, an initial pool of items was shared with eight subject matter experts specializing in psychology, entrepreneurship, and cross-cultural studies. The experts evaluated the items using a 5-point Likert-type scale (1 = Not Relevant to 5 = Highly Relevant). Only items with an average rating of 4.0 or higher were retained for further analysis. This rigorous review process ensured that the scale items were contextually appropriate and psychometrically robust.

For the preliminary stage of tool development, a sample of 360 immigrant SME owners was used. This sample size was deemed sufficient for exploratory factor analysis (EFA) based on established guidelines (e.g., 5–10 participants per item) (Mwansisya et al., 2021).

For the validation phase, the sample size was expanded to 1,273 respondents to ensure sufficient power for confirmatory factor analysis (CFA) and structural equation modeling (SEM). This sample was obtained by mapping businesses in three randomly selected emirates and approaching every fifth business unit for participation. While some declined or did not respond, the resulting sample size exceeded the minimum requirements for robust statistical analysis. Moreover, criterion validity was established on a sample of 206 respondents ensuring the sufficient sample size.

Flowchart of the scale development process The following flowchart summarizes the multi-step scale development process including the review of literature, item generation, content validity, EFA, Reliability, CFA, and Criterion Validity (Fig. 1).

Demographic characteristics of participants Demographic information on the participants is included to provide a clearer profile of the sample. For instance, participants represented diverse nationalities, including expatriates from South Asia (India, Pakistan), the Far East (China), the Middle East (Lebanon, Egypt), and Africa (Nigeria, South Africa). Their businesses spanned multiple industries, such as education, health and beauty, entertainment, convenience stores, restaurants, and real estate. Additionally, all participants were owners of businesses in the profitability

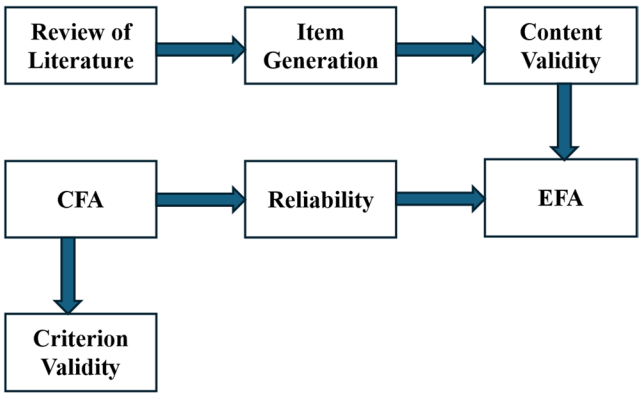

Fig. 1 Flowchart of the scale development process

stage, further focusing the study on established immigrant entrepreneurs.

Study 1 Content validity for the new hardiness measure was assessed in Study 1 by consulting experts in positive psychology ($N=8$ expert raters). Initially, a pool of 35 items was derived from 42 items. In Study 2, this pool of 35 items was administered to 360 participants to explore its internal structure and assess item properties, aiming to select the most suitable items for the Hardiness Scale. Detailed discussions on item generation and the initial validation of the questionnaire using EFA were conducted, alongside an investigation into internal consistency.

Study 2 Validation of the 35-item questionnaire was conducted in Study 2 through EFA. Items with a corrected item-total correlation exceeding 0.60 were shortlisted for analysis, surpassing the cutoff criterion of 0.40 (DeVellis and Thorpe, 2021). Seventeen items were subsequently removed, leaving a total of 18 items for the final scale.

Participants The sample for Study 2 comprised 360 immigrant entrepreneurs from the UAE, with a mean age of 33.73 years (SD = 7.76). Female participants accounted for 14.7%, while males accounted for 85.3%, the gender ratio is similar in other studies (e.g., Gilani et al., 2025). Participants provided informed consent, and anonymity was guaranteed.

Exploratory factor analysis (EFA)

To explore the factor structure of the Hardiness Scale, the final set of 18 items was subjected to EFA employing the Principal Axis Factoring (PAF) analysis using Oblimin rotation with Kaiser Normalization as the extraction method. Prior to the analysis, the authors assessed the psychometric adequacy of the items by examining the Kaiser-Meyer-Olkin Sampling Adequacy and Bartlett's Sphericity Test (Jaafari et al., 2023). Several criteria were utilized to determine the number of factors to retain, including the Kaiser criterion (eigenvalue greater than 1), and factor loadings equal to or greater than 0.70 (Kaiser, 1970), to allocate items to factors. The results revealed a Kaiser-Meyer-Olkin index of 0.903, surpassing the recommended minimum value of 0.60 (Kaiser, 1970). Additionally, Bartlett's Test of Sphericity (Bartlett, 1954) yielded a significant result ($\chi 2=2.97$, $df=153$, $p=.001<.01$ level of significance), indicating sufficient inter-item correlations and validating the suitability of exploratory factor analysis.

The PAF was used as the extraction method. The Scree Test for factor identification, according to Cattell (1966), revealed a three-factor model (F1, Eigenvalue = 5.976; F2 Eigenvalue = 4.959; F3 Eigenvalue = 4.133), explaining 83.717% of the total cumulative variance (F1 Variance = 33.201; F2 Variance = 27.552; F3 Variance = 22.963). Further support for the three-factor solution was provided by parallel analysis (Lim & Jahng, 2019). The scree plot, depicting the number of factors using eigenvalues as criteria, is presented in Fig. 2.

The PAF analysis with Oblimin rotation showed a three-factor solution. The method was chosen to allow for potential correlation between factors, which is theoretically justified given the interrelated nature of psychological constructs like entrepreneurial hardiness.

Items related to commitment dimension (factor 1) demonstrated strong loadings, such as Item 10, 3, 5, 17, 14, and 15. Loadings for this factor ranged from 0.765 to 0.872, suggesting a well-defined and internally consistent construct. Factor 2 consisted of items of control dimension, including Item 9, 1, 6, 18, 4, and 2, which loaded substantially on this component (range: 0.670 to 0.835). Moreover, factor 3 included items for challenge dimension such as Item 11, 7, 8, 12, 13, and 16, with loadings ranging from 0.652 to 0.805 (see Table 2).

All items loaded most strongly on a single factor, and cross-loadings were generally low, reinforcing the distinctiveness of the three dimensions. These findings confirm the conceptual structure of the EHS-18 and support its

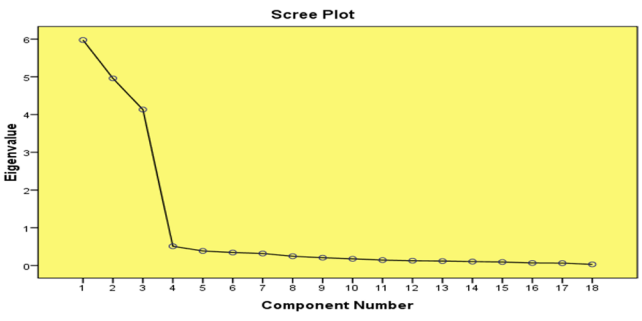

Fig. 2 The Scree Plot for showing three factors with eigenvalues much higher than 1, the cut-off value

Table 2 The principal axis factoring (PAF) analysis using oblimin rotation with Kaiser normalization

Items	Factor 1	Factor 2	Factor 3
ITEM_10	0.872	0.21	−0.22
ITEM_3	0.803	0.198	−0.215
ITEM_5	0.797	0.185	−0.24
ITEM_17	0.782	0.202	−0.212
ITEM_14	0.776	0.217	−0.198
ITEM_15	0.765	0.2	−0.188
ITEM_9	−0.28	0.835	0.21
ITEM_1	−0.21	0.742	0.195
ITEM_6	−0.22	0.731	0.22
ITEM_18	−0.205	0.725	0.183
ITEM_4	−0.215	0.698	0.271
ITEM_2	−0.24	0.67	0.188
ITEM_11	0.275	0.21	0.805
ITEM_7	0.18	0.195	0.7
ITEM_8	0.23	0.184	0.688
ITEM_12	0.2	0.223	0.675
ITEM_13	0.26	0.211	0.66
ITEM_16	0.25	0.226	0.652

psychometric robustness. Furthermore, the use of PAF with Oblimin rotation allowed for a more detailed understanding of the underlying factor relationships, showing slight intercorrelations without compromising factor clarity. Overall, the factor solution is theoretically sound, empirically robust, and consistent with previous exploratory findings, validating the EHS-18 as a multidimensional measure of hardiness specifically suited to the context of immigrant entrepreneurship in the UAE.

Study 3 The third phase of the study involved assessing the reliability and validity of the measure.

Study 4 Subsequently, CFA was conducted in the fourth phase of the study.

In Study 3, the overall Cronbach's alpha coefficient for the tool was found to be 0.848. Additionally, Cronbach's alpha values for the Challenge, Commitment, and Control factors were 0.985, 0.967, and 0.921, respectively, indicating high internal consistency of the three-factor 18-item version of the hardiness scale (see Table 3). Furthermore, the correlated item-total correlation values for all items exceeded the cutoff criterion of 0.3 (refer to Table 4). Additionally, the inter-item correlations for all items fell within the range of 0.3 to 0.9 (Quinn et al., 2019).

Convergent validity was assessed by computing the overall correlation between the scale and the Dispositional Resilience Scale (DRS-15) (Bartone, 2013). The 18-item measure demonstrated a notably strong positive correlation with the DRS-15 (r=.79, N=1273, p=.001<.01 level).

Structural equation modeling

An analysis of factor structure in Study 4, Structural Equation Modeling (SEM) was employed to investigate the factor structure of the 18 items through CFA.

The study involved 1273 immigrant entrepreneurs engaged in managing small and medium-sized enterprises. The sample encompassed both male and female participants, with a mean age of 32.51 years (SD=8.08). The gender distribution consisted of 1107 male and 166 female entrepreneurs, with males comprising the majority (86.96%) of the sample. All participants provided informed consent, ensuring anonymity and confidentiality of their responses.

Confirmatory factor analysis (CFA)

Confirmatory Factor Analysis was conducted using AMOS V24.00 to validate the model derived from exploratory factor analysis (EFA) (Jaafari et al., 2023). Maximum likelihood estimation and a covariance matrix were utilized for analysis. Skewness and kurtosis values for all variables were within acceptable ranges (Sharma & Ojha, 2019). Various fit indices were employed, including the Normal Fit Index (NFI), Relative Fit Index (RFI), Incremental Fit Index (IFI), Goodness-of-fit Index (GFI), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). A χ^2/df ratio of 2 was considered indicative of a good fit, while values of 0.90 or higher for CFI, RFI, IFI, TLI, and GFI, and 0.08 or lower for RMSEA indicated reasonable model fit (Jaafari et al., 2023).

Table 3 Presents cronbach's alpha for 18 items hardiness scale and item-total statistics on all three factors:

Overall Scale's Cronbach's Alpha (EHS-18)	0.848					
Factor 1 Commitment Cronbach's Alpha (No. of Items=6)	0.985					
Factor 1 Cronbach's Alpha if Item Deleted	Item 3	Item 5	Item 10	Item 14	Item 15	Item 17
	0.881	0.879	0.881	0.883	0.882	0.884
Factor 2 Commitment Cronbach's Alpha (No. of Items=6)	0.967					
Factor 2 Cronbach's Alpha if Item Deleted	Item_1	Item 2	Item 4	Item 6	Item 9	Item_18
	0.86	0.858	0.86	0.865	0.862	0.858
Factor 3 Challenge Cronbach's Alpha (No. of Items=6)	0.921					
Factor 3 Cronbach's Alpha if Item Deleted	Item_7	Item 8	Item 11	Item 12	Item 13	Item_16
	0.809	0.807	0.812	0.803	0.806	0.805

Table 4 Presents item-total statistics on an overall 18 items scale:

Overall Scale	Item content	Corrected Item-Total Correlation	Cronbach Alpha if Item Deleted
Item 1	The failure of a business to achieve its goals is solely due to a lack of hard work.	0.427	0.842
Item 2	Avoiding irregularities in business activities is always a top priority.	0.423	0.842
Item 3	I feel like my business lacks a clear sense of purpose.[R]	0.522	0.837
Item 4	In entrepreneurship, the success of a business depends on the decisions made by its leadership.	0.47	0.839
Item 5	I am motivated by the work activities involved in running my business.	0.529	0.837
Item 6	I believe that my role significantly impacts the future success of my business.	0.337	0.846
Item 7	As an entrepreneur, I am comfortable taking on complex tasks that require managing multiple responsibilities.	0.428	0.841
Item 8	As an entrepreneur, I find it difficult when unexpected events disrupt my daily routine.[R]	0.382	0.843
Item 9	The success of my business is largely determined by the actions that I take.	0.387	0.844
Item 10	I find the process of growing my business to be engaging.	0.475	0.839
Item 11	I feel comfortable with a flexible daily schedule that allows for adaptation to changing business needs.	0.327	0.846
Item 12	I am efficient at swiftly addressing any problems that may develop in my enterprise.	0.467	0.84
Item 13	As an entrepreneur, I can maintain a sense of balance in difficult situations.	0.436	0.841
Item 14	I am fully purposeful in achieving the goals of my business.	0.535	0.836
Item 15	I believe that every action I take toward growing my business has a clear purpose.	0.533	0.836
Item 16	I remain passionate about growing my business even when faced with setbacks.	0.411	0.842
Item 17	I can find fulfillment in the routine tasks associated with running my business.	0.509	0.838
Item_18	I strongly believe in the mission of my business.	0.432	0.841

[R] The negatively scored items

The evaluation of the Goodness-of-Fit Indices for three-factor model (EHS-18) ($N=1273$) revealed favourable fit indices ($\chi^2/df=2.930$, NFI = 0.947, RFI = 0.939, IFI = 0.952, GFI = 0.880, TLI = 0.944, CFI = 0.952, and RMSEA = 0.035). The path model exhibited a strong fit, as demonstrated by the indices.

Factor loadings/standardized beta coefficients on three dimensions for all 18 items on EHS-18 *The results of the CFA indicated that the 18 items effectively capture the dimensions of hardiness, namely commitment, challenge, and control (see Fig. 3). The factor loadings or standardized beta values for all 18 items exhibited significant and positive associations with their respective factors (β values ranging from 0.776 to 0.983, p =.000, indicating significance at the < 0.001 level for all item loadings). Even the lowest loading, at 0.776, exceeded the acceptable threshold (see Supplementary Table A in supplementary document).*

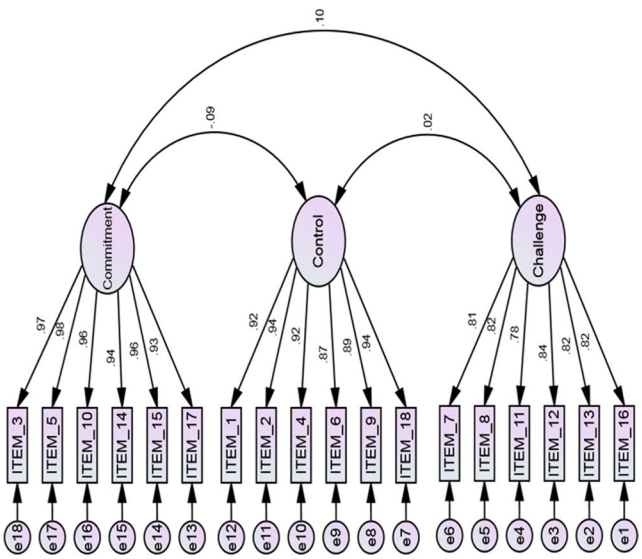

Fig. 3 Path diagram showing dimension-wise factor loadings on CFA

Correlation matrix presenting criterion validity of EHS-18 with BRS-6 and PSS-10

Criterion (concurrent) validity was assessed by examining the correlation between the final 18-item Entrepreneur Hardiness Scale and the Brief Resilience Scale (BRS-6) (Smith et al., 2008) as well as for discriminate validity with Perceived Stress Scale (PSS-10) (Mozumder, 2022). The sample for this study included 206 participants. The analysis revealed a notably strong positive correlation with the BRS-6 (r=.71, N=206, p=.021, indicating significance at the <0.05 level). Conversely, a significant moderate negative correlation was observed with the PSS-10 (r=−.62, N=206, p=.038, also significant at the <0.05 level).

The final 18-item Entrepreneur Hardiness Scale (EHS-18) was developed in this study to assess entrepreneur hardiness. Respondents are required to rate each item on a 4-point Likert scale, ranging from 1 (strongly disagree) to 4 (strongly agree). Notably, two items in the scale, specifically items 3 and 8, are reverse scored. The scale is structured into three dimensions: commitment (6 items: 3, 5, 10, 14, 15, 17), control (6 items: 1, 2, 4, 6, 9, 18), and challenge (6 items: 7, 8, 11, 12, 13, 16). Scores for each dimension are computed by summing the responses to all items within that dimension. Likewise, the total score on the EHS-18 is obtained by summing the responses to all 18 items, with scores ranging from a minimum of 18 to a maximum of 72. A normalized score exceeding the respective normalized mean score on each dimension, or the total scale indicates higher levels of the corresponding factor/hardiness, whereas a lower score suggests lower levels of the factor.

Analysis and discussion

The reviewed hardiness scales present a wide range of strengths and limitations, reflecting the evolution of hardiness measurement tools across diverse populations and contexts. Kobasa's (1979) original Hardiness Scale, though pioneering, faced criticism for its negative framing, allowing neuroticism to influence responses. Bartone et al.'s Dispositional Resilience Scales (DRS-50 and DRS-15) brought notable advancements in hardiness research, yet issues of low subscale reliability and construct validity persist, particularly in diverse populations like military personnel and naval cadets (Madrigal et al., 2016). Other scales, such as Pollock and Duffy's (1990) 34-item measure, and Sujisha and Manikandan's (2018) unidimensional construct for adolescents, have struggled with psychometric limitations, including poor test-retest reliability.

Scales tailored for specific populations, such as the Occupational Hardiness Questionnaire (Jiménez et al., 2014) and tools developed for family caregivers (Hosseini et al., 2022) or children (Soheili et al., 2021), revealed the adaptability of hardiness constructs across contexts. However, these scales lack validation for entrepreneurial populations. While the Hardiness Resilience Gauge (HRG) (Bartone et al., 2023) has demonstrated robust reliability and validity in adult populations, it does not address the unique demands of the entrepreneurial domain.

The Entrepreneurial Hardiness Scale (EHS-18) was developed to fill this critical gap. Specifically tailored to the entrepreneurial context, EHS-18 incorporates the foundational dimensions of commitment, challenge, and control, ensuring alignment with established hardiness constructs. The scale demonstrates strong psychometric properties, including internal consistency and construct validity, highlighting its suitability for assessing hardiness in this unique population. Furthermore, the development of EHS-18 aligns with recent research emphasizing the importance of resilient personality traits in mitigating burnout and enhancing entrepreneurial performance (Quiun et al., 2021). By providing a reliable and valid tool for entrepreneurial hardiness, the EHS-18 not only bridges a significant gap in the literature but also paves the way for targeted interventions and training programs to promote resilience and success in entrepreneurial field.

This study took the global hardiness scale as its starting point and developed a new, more nuanced hardiness scale with 18 factors and a 3-factor model. The goal was to determine how male and female entrepreneurs in the UAE engage with commitment, control, and challenge norms. By examining the entrepreneurial traits of these individuals, the study sheds light on the UAE's broader support for entrepreneurship. Ultimately, the findings suggest that a national effort to streamline and regulate entrepreneurship is essential for shaping the country's economic development and entrepreneurial activity.

Small and medium-sized enterprises (SMEs), which encompass self-employed individuals, contribute significantly to the global economy, constituting 90% of enterprises worldwide and generating 70% of global employment opportunities. These enterprises, often led by entrepreneurs, face various stresses and challenges, such as the recent COVID-19 pandemic, putting millions of jobs at risk (Stephan et al., 2021). Drawing from the provided literature, hardiness emerges as an individual's capacity to cope with stress and mitigate its adverse effects on performance. Both the original Kobasa (1979) model and the more contemporary Maddi et al. (2006) model suggest that hardiness involves cognitive appraisal, a positive outlook on life, and adaptive coping strategies.

In this study, grounded in Kobasa's theoretical framework (1979), we outlined the development of the hardiness

instrument and presented evidence supporting its psychometric properties. The final hardiness model comprised three factors: commitment, control, and challenge. Our data indicated that the three-factor model, with six items per factor, exhibited a favourable fit. From a psychometric perspective, the final instrument demonstrated that hardiness manifests as a construct with three components, exhibiting good internal consistency.

As detailed across Studies 1 through 5, an initial 42-item measure was developed to assess entrepreneur hardiness. Study 1 involved distributing the entire item pool to eight subject experts to assess content validity. Subsequently, seven items were eliminated, resulting in a 35-item set for EFA. The findings from Study 2 revealed a clear three-factor structure comprising commitment, challenge, and control. This three-factor model aligns with existing literature, such as the work by Bartone et al. (2023), who developed the Hardiness Resilience Gauge, which also consists of commitment, control, and challenge factors. Additionally, our model substantiated the theoretical framework proposed by Kobasa (1979) and findings from other studies (e.g., Bartone, 2013).

In Study 3, reliability and validity were assessed by examining internal consistency and concurrent validity in a second sample group. Cronbach's alpha was computed to assess the reliability of the multifactor model. The results indicated high-reliability coefficients for the Entrepreneur Hardiness Scale (EHS), with a total hardiness Cronbach's α of 0.848 and Cronbach's α values of 0.986, 0.967, and 0.921 for the commitment, control, and challenge subscales, respectively. Additionally, convergent validity was examined by correlating the EHS with an existing hardiness measure, the DRS-15 (Bartone, 2013). The correlation coefficient between the EHS and DRS-15 revealed a strong correlation, with $r=.79$, $p=.001$, significant at the <0.01 level.

In Study 4, CFA was employed to evaluate the model derived from exploratory factor analysis (EFA). The CFA results supported a three-component model as the best fit for the 18 items of the EHS, indicating consistency with the conceptualization of hardiness as a personality trait comprising interconnected components with shared outcomes. This finding aligns with previous research utilizing CFA to model hardiness (Bartone et al., 2023; Maddi et al., 2006).

In Study 5, criterion validity was established by examining correlations between the EHS the Brief Resilience Scale (BRS-6) and the Perceived Stress Scale (PSS-10) to confirm concurrent validity. The correlation analysis revealed a strong positive correlation between the EHS and BRS-6 ($r=.71$, $p=.021$, significant at the <0.05 level). Additionally, a moderate negative correlation was observed between the EHS and PSS-10 ($r=-.62$, $p=.038$, significant at the <0.05 level).

Furthermore, amidst emergencies such as the COVID-19 pandemic, various psychological, relational, legal, economic, and social challenges emerge. Studies have shown that loneliness is associated with cognitive decline, negativity, despair, and increased vulnerability to social risks (Giorgi et al., 2020). Observations during the pandemic indicate both negative and positive behavioural shifts. While instances of increased domestic violence and conflicts have been reported, there are also instances of individuals adopting positive behaviours such as learning new skills, engaging in hobbies, and enhancing their living environments. Individuals with high levels of hardiness are more likely to experience posttraumatic growth and psychological well-being following highly stressful events.

Hardiness entails perceiving adverse events as opportunities for growth and taking proactive steps to address challenges. Therefore, interventions aimed at enhancing hardiness attitudes and coping abilities may facilitate healthy adaptation among individuals facing significant adversity (Bartone and Bowles, 2021). Further research into the complexities of human behaviour and responses to adversity is warranted.

The validation of the psychometric properties of the EHS-18 holds significance for facilitating more thorough and structured research within the entrepreneurial domain. This validation enables investigations into the role of hardiness in stress management, navigating new challenges in global markets, recovering from setbacks, responding to crises such as the COVID-19 pandemic, and assessing overall health and well-being (Tantry et al., 2025).

From the perspective of social identity theory, leadership serves as an exemplar of social change, wherein leaders possess the ability to positively influence the behavioural tendencies of their followers by promoting higher levels of psychological hardiness. A leader who embodies hardiness traits can inspire other group members or subordinates to adopt hardiness and contribute to positive societal transformations, as the collective identity of a group often mirrors that of its leader.

Conclusion

In line with the concept of psychological hardiness (Kobasa, 1979), this study defines hardiness as "an individual's psychological resilience that enables them to perceive change as an opportunity, find purpose, and effectively manage adversity and stress." The study delineates the developmental and validation process of an entrepreneur's hardiness measure across five studies. The initial study involved generating a pool of 42 items, which underwent content validation by eight experts, resulting in 35 items with a Content Validity

Index (CVI) exceeding 0.875, meeting the recommended threshold (Yusoff, 2019), and qualifying for EFA. The EFA identified 18 items distributed across three theorized factors, leading to the exclusion of 17 items with poor factor loadings or cross-loading issues.

Subsequent studies focused on establishing reliability and validity. Study 3 confirmed the internal consistency of the 18-item, three-factor model, with overall Cronbach's alpha of 0.848 and component alphas for Challenge, Commitment, and Control at 0.985, 0.967, and 0.921, respectively. Convergent validity was established through correlation with the DRS-15. Study 4 conducted CFA to validate the EFA-derived model, while Study 5 established criterion validity, showing significant correlations with the BRS-6 and PSS-10.

The primary contribution of this study lies in the development of an 18-item, three-dimensional measure of entrepreneur hardiness, encompassing commitment, control, and challenge dimensions. The EHS-18 holds potential for application in academia, interventions, and industry research by leaders, policymakers, entrepreneurs, and scholars.

Limitations, despite the robust sample sizes across diverse entrepreneurial fields, the study's non-random sampling limits the generalizability of findings. Moreover, cultural variations may affect the measure's validity across languages. Future research should explore the construct's nomological network and compare it with related constructs such as psychological capital and sense of coherence, particularly in the context of coping with stress, including during the COVID-19 pandemic.

Implications, despite limitations, the study offers practical implications. Integrating hardiness assessment in organizational contexts could enhance need satisfaction and work engagement through tailored educational, training, and coaching programs. Strengthening leaders' hardiness may foster resilience among subordinates, thereby enhancing organizational adaptability under challenging circumstances. Hardiness development, characterized by progressive exposure to demanding experiences and environmental support, could be facilitated through training programs, promoting healthy adaptation among individuals facing adversity.

The Entrepreneurial Hardiness Scale-18 (EHS-18) performed exceptionally well, as well as acknowledging potential limitations. For example, while the EHS-18 demonstrated strong content validity, Cronbach alpha ensuring high reliability of the scale, and criterion validity, it was found that its performance may vary across different entrepreneurial contexts or populations due to cultural and contextual factors.

However, the reliance on self-reported data may introduce response biases, such as social desirability. Employing other parallel methods such as PAF and using additional tests, such as the Hull test or Achim's NEST, to demonstrate the convergence of different methods.

The potential cultural influences on the scale's performance, acknowledging how cultural and socio-economic contexts in the UAE may shape the hardiness of immigrant entrepreneurs. While the EHS-18 was developed and validated in the UAE, a multicultural setting, we recognize the need to explore its applicability to other immigrant entrepreneur populations in different regions. Future research directions will include cross-cultural validation to examine the scale's generalizability and adaptability to diverse immigrant groups globally.

The EHS-18 contributes to the growing body of literature on entrepreneurial hardiness by offering a framework that integrates hardiness, adaptability, and persistence within the unique context of immigrant entrepreneurship. This work extends existing theories of hardiness by demonstrating how entrepreneurial hardiness is influenced by migration-specific challenges and opportunities.

The study expands this discussion to include actionable recommendations for policymakers and stakeholders. For instance, supporting the development of immigrant entrepreneur networks, enhancing access to culturally responsive business resources, and promoting resilience-building programs tailored to immigrant business owners could help bridge gaps identified in the study.

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Authors contributions Ansarullah Tantry was involved in conceptualizing the research, literature, generating items, designing methodology, data collection, doing analysis components, and writing up the findings. Nida Khan was also involved in data collection and literature. Mohamed Ashmel Mohamed Hashim was involved in reviewing and collecting literature. Issam Tlemsani was involved in the literature, write-up of the discussion section as well as the final editing. Sayed Abdul Majid Gilani was involved in the drafting and finalising of the Introduction and Conclusion sections. Alsabbah Saher was involved in the editing, proofreading.

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Declarations

Competing interests The author(s) has/have no competing interests to declare.

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