Arabic validation of the Three-dimensional Meaning in Life (3DM) Scale: A bifactor model approach

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Abstract: Recent research provides support for the tripartite framework of meaning in life (MIL). The Three Dimensional Meaning in Life (3DM) Scale is a self-report instrument based on the tripartite framework including coherence, purpose, and significance. The present research tested the psychometric properties of the 3DM with Arabic-speaking adults. This cross-sectional study recruited a total of 516 (428 female) participants in the study through online (e.g., social media) and offline (e.g., contacting academicians at different universities in Egypt) data collection. The confirmatory factor analysis replicated the original three-factor solution to the 3DM. The factor loadings of the three-factor model from .61 to .92. The 3DM subscales had good internal consistency scores ranging from .78 to .85. The bifactor model of the Arabic 3DM did not evidence the unidimensional measurement of the 3DM. The findings demonstrate that the Arabic 3DM is a valid and reliable measure. Future research should examine different types of validity and temporal stability of the 3DM, cultural dimensions on MiL, and similarities and distinctions between the tripartite frameworks across diverse populations among Arabic-speaking people.

Keywords: 3DL scale; meaning in life; psychometric properties; well-being

To cite this article (APA Style):
Elwakeel, S. A., Subasi, M., Al-Hendawi, M., & Bulut, S. (2024). Arabic validation of the Three-dimensional Meaning in Life (3DM) Scale: A bifactor model approach. *Psikohumaniora: Jurnal Penelitian Psikologi, 9*(2), 253-266. https://doi.org/10.21580/pjpp.v9i2.22488

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Introduction

Meaning in life (MiL) has become an increasingly prominent research area in psychology, psychotherapy, social sciences, and health. It has been one of the central topics in positive psychology and well-being research. It can be described as a combination of goal-directedness; pursuing valued goals; experiencing flow-like states; maintaining stable perceptions of one's life conditions and having a clear understanding of them; and considering oneself significant (King & Hicks, 2021). It is also considered to be an important form of motivation and a crucial element of well-being (Heintzelman & King, 2014; Huta & Waterman, 2014). Empirical studies have demonstrated its predictive power concerning well-being, health, and mortality (Almeida et al., 2022). Recent meta-analytical research demonstrates that MiL has a robust positive link with well-being (J.-B. Li et al., 2021) and protects against depression and anxiety (Boreham & Schutte, 2023).

Current research demonstrates that individuals who perceive their lives to be meaningful tend to exhibit higher levels of psychological well-being (Stojilković et al., 2024). This encompasses factors such as increased life satisfaction, higher self-esteem, and reduced levels of anxiety and depression. The presence of meaning in life can endow individuals with a sense of purpose and direction, thereby fostering a more positive mental state (Zambelli & Tagliabue, 2024). Furthermore, MiL has been associated with improved physical health. Previous research indicates that individuals who find their lives to be meaningful are more likely to engage in healthy behaviors, possess stronger immune systems, and experience lower levels of stress, all of which contribute to better health outcomes. This association between MiL and health is thought to arise from the motivational boost that a sense of meaning provides, encouraging individuals to take better care of themselves (Sharkia & Taubman – Ben-Ari, 2024). Overall, MiL research has proven to be an invaluable area of study, with significant implications for enhancing both mental and physical health, improving quality of life, and promoting longevity. It continues to be a primary focus across various fields within the social and health sciences.

In recent years, multidimensional conceptualizations of MiL have increasingly been studied. In this context, two related tripartite models stand out in terms of well-defined concepts and empirical support. Some researchers have evaluated comprehension, purpose, and mattering in life employing the Multidimensional Existential Meaning Scale (MEMS) (George & Park, 2016, 2017), considering these three components as the fundamentals of MiL. In a similar vein, other researchers have employed a slightly different model of MiL measured by the Three Dimensional Meaning in Life (3DM) Scale (Martela & Steger, 2016, 2023). The 3DM assumes that meaning in life includes three key dimensions: coherence, purpose and significance in life. It mainly differs from the MEMS model in its conceptualization of significance/mattering in life, while coherence and purpose are similar to their counterparts in the MEMS model (i.e., comprehension and purpose). The 3DM emphasizes that coherence, purpose and significance are separate constructs, despite being relatively connected. Coherence reflects the cognitive component of MiL; purpose represents its motivational component; while significance taps into the affective component of MiL (Martela & Steger, 2016).

Recent studies corroborate the multidimensional measures of MiL, particularly the MEMS and the 3DM. The original MEMS includes three factors, each of which measures five items. It indicated good fit indices: $\chi^2 = 216.64$, p < .001, CFI = .952, RMSEA = .075, SRMR = .040 (George & Park, 2017). The MEMS subscales had moderate to high positive correlations with the presence of meaning and perceived personal meaning. Each

facet had low to moderate positive associations with life self-concept clarity, behavioral activation, spirituality, life satisfaction, and positive affect, while only comprehension and mattering subscales had low to moderate positive associations with dogmatism, body sanctification, and willingness to self-sacrifice. No facet had significant associations with behavioral inhibition, while each facet had low to moderate negative associations with negative affect, depression, anxiety, and stress (George & Park, 2017).

The Polish version of the MEMS comprised a three-factor solution with three items in each facet, while excluding two items for each factor: $\chi^2 = 50.7$, p < .001, CFI = .989, TLI = .983, RMSEA = .052. This version indicated a strong association with presence of meaning and a very strong association with purpose in life (Gerymski & Krok, 2020). The Spanish version replicated the original three-factor solution with no exclusion of items among non-clinical or clinical samples: $\chi^2 = 262.953$, p < 0.001, CFI = .991, RMSEA = .043. The clinical sample consisted of participants who reported that they had a mental disorder diagnosis. Measurement invariance indices supported the psychometric properties of the Spanish MEMS across gender. It had a negative correlation with negative affect, while having strong positive correlations with positive affect and purpose in life. Each facet of the Spanish MEMS predicted mental health outcomes. These facets positively predicted positive affect, whereas depression, anxiety and distress were negatively predicted by the subscales (Marco et al., 2022). The Turkish version of the MEMS showed good fit indices: $\chi^2 = 409.6$, df = 87, p < .001, CFI = .99, TLI = .99, RMSEA = .07, SRMR = 0.04. It additionally tested the bifactor MEMS model, demonstrating excellent fit indices: $\chi^2 = 152.2$, df = 75, p < .001, CFI = 1.00, TLI = 1.00, RMSEA = .04, SRMR = 0.03. The version had moderate to high positive correlations with presence of meaning, but low to moderate positive associations with life satisfaction, positive affect,

mental health continuum, emotional well-being, social well-being, psychological well-being, and need satisfaction (i.e., autonomy, competence, relatedness). In contrast, the Turkish MEMS had low to moderate negative associations with negative affect, depression, anxiety, and stress (Subasi et al., 2024b).

Similar to the MEMS, the 3DM scale is a three-factor meaning in life scale consisting of coherence, purpose and significance constructs. Coherence refers to how people perceive stability in their lives and understand what is happening around them. It is linked to making sense of one's life based on consistent patterns of life experiences. People with high coherence can live harmoniously and regulate themselves; have a better understanding of their life; and are likely to consider that their life makes sense. In contrast, people with low coherence struggle with uncertainty in their lives and are likely to perceive their life as incoherent (George & Park, 2016; Martela & Steger, 2016; Wong, 1998). Purpose refers to personal goals, goal pursuit, and self-regulation. People with a high level of purpose are likely to be more motivated to pursue individual values and goals. Conversely, those with low purpose may not effectively use self-regulation strategies on the path to their pursuit of goals (Martela & Steger, 2023; McKnight & Kashdan, 2009). Significance refers to whether individuals perceive their life to be worthwhile, significant and valuable. It is a subjective evaluation of one's life worth (Martela & Steger, 2016). These distinct constructs of MiL have positive associations such as well-being outcomes (Li et al., 2021) and psychological growth (Graci & Fivush, 2017), and negative ones such as depression and anxiety (Boreham & Schutte, 2023; Martela & Steger, 2023).

The 3DM framework aligns with several theoretical approaches; for example, existential psychology, positive psychology, and self-determination theory, each of which offers valuable insights into the dimensions of coherence,

purpose and significance. Although these perspectives are not necessarily elaborated on one dimension of the 3DM, in our study we focus on particular dimensions. Existential psychology provides a foundational basis for understanding the concept of coherence within the 3DM. According to existential theorists such as Viktor Frankl, the human search for meaning is an inherent part of existence. Frankl's existential approach suggests that life has meaning under all circumstances, even the most miserable ones, and it is the individual's task to find this meaning (Frankl, 1985).

The dimension of coherence in the 3DM captures this existential quest, reflecting how individuals comprehend and integrate their life experiences into a coherent whole (e.g., an item of the coherence: "I can comprehend what my life is all about"). This understanding is critical for individuals to make sense of their past, present, and future, contributing to an overall sense of meaning in life. The purpose dimension of the 3DM is deeply rooted in theories from positive psychology. Positive psychologists emphasize the importance of purpose as a key component of well-being. It provides direction and motivation, encouraging individuals to pursue goals that are meaningful and significant (Seligman, 2004). This is in line with the notion of eudaimonic well-being, which involves the pursuit of virtuous goals and personal growth. The 3DM's purpose dimension (e.g., an item of the purpose: "I pursue one or more big purposes in my life") measures the extent to which individuals feel driven by overarching life goals, reflecting a forward-looking perspective that gives their lives direction and motivation. Self-determination theory (SDT) further informs the significance dimension of the 3DM. SDT posits that the fulfillment of basic psychological needs—autonomy, competence, and relatedness—is essential for psychological growth and well-being (Deci & Ryan, 2000). The significance dimension (e.g., an item of significance: "My life is full of

value") may be reflective of this theory, emphasizing how individuals perceive their lives as valuable and worthwhile. This perception is often a result of fulfilling these basic needs, which in turn fosters a sense of intrinsic value and self-worth. Therefore, the significance dimension captures the subjective evaluation of life's worth, contributing to the overall sense of meaning.

The original 3DM had the following potential items in the item pool: 14 for coherence, 19 for purpose, and 19 for significance. The final version had a total of 11 items, three of which referred to significance, while coherence and purpose included four items each. The final 3DM had good fit indices: χ^2 = 73.6, df = 41, p < .001, CFI = .988, TLI = .984, RMSEA = .052 [90% CI = .032, .071]), SRMR = .022, while the subscales had good reliability scores: coherence α = .90, purpose α = .90, significance α = .90 (Martela & Steger, 2023). Each facet of the 3DM demonstrated that coherence, purpose, and significance positively correlated with comprehension, purpose, mattering, presence of meaning, autonomy, competence, relatedness, positive affect, satisfaction with life, authenticity, self-esteem, beneficence, calling, vitality, sacrifice, behavioral activation, greater good, valued life, and reasons to live. The 3DM negatively correlated to negative affect, stress, depression, self-clarity, and self-alienation (Martela & Steger, 2023).

In the German version of the 3DM, Beyer (2023) confirmed the original three-factor structure with good reliability scores. Their results showed that coherence, purpose and significance mainly had moderate positive associations with presence of meaning, emotional well-being, social well-being, and psychological well-being, but moderate negative associations with perceived stress. In the Turkish versions of the 3DM, Subasi et al (2024a, 2024b) replicated the original three-factor solution among Turkish-speaking adults and university students. Subasi et al. (2024a) tested a bifactor model of the 3DM, and revealed

that the model fit indices did not support the unidimensional measurement of the version. Subasi (2024a, 2024b) also demonstrated that the 3DM subscales had predominantly moderate positive associations with presence of meaning, positive affect, satisfaction with life, emotional well-being, social well-being, psychological well-being, autonomy, competence, and relatedness, while indicating moderate negative associations with negative affect, depression, anxiety, and stress. Overall, the 3DM validations received strong support for the 3DM measurement.

The 3DM may be chosen over the MEMS because of three fundamental advantages. First, although the coherence and purpose dimensions are fairly similar to the comprehension and purpose dimensions of the MEMS, the 3DM differs from the MEMS in the conceptualization of mattering and significance. The 3DM suggests that significance concerns one's subjective perception of whether life is worth living and is significant. However, the MEMS suggests that mattering in life evaluates one's significance in life with consideration of the cosmic timescale and the universe. Martela and Steger (2023) have empirically shown that mattering and significance are distinct constructs. Second, 3DM research in non-Western contexts should test whether these conceptual differences are supported by empirical evidence (Martela & Steger, 2023), since cultural differences can shape how meaning in life and its nuances are perceived. Finally, SDT provides a justified theoretical explanation for the significance dimension of the 3DM, which is less likely to be applicable to the mattering dimension of the MEMS.

The relevance of the 3DM is highlighted by previous empirical research that has focused on validating its psychometric properties across different cultural contexts with different theoretical approaches (e.g., SDT). Previous studies have tested the psychometric properties of English, German, and Turkish versions of the 3DM. The majority of available research on meaning in life with distinct factors focuses on Western contexts; however, it is a culturally nuanced concept. For example, Arabic culture often highlights traditional values, religious beliefs, and collective identity, which can influence how Arabic people consider and conceptualize meaning in life. Further clarification is required on whether the aspects of 3DM accurately capture the dimensions of coherence, purpose, and significance, providing a culturally adapted tool to evaluate MiL from a multidimensional perspective.

Martela and Steger (2023) also suggest that coherence, purpose and significance reflect a second order meaning in life construct. Therefore, the multidimensional measurement of the 3DM does not preclude the measurement of its unidimensional structure, necessitating testing of whether the 3DM reflects a second-order MiL construct. Another reason to translate the 3DM into Arabic is the lack of meaning in life measures with these dimensions. It suggests that there is a need to test both global and cultural conceptualizations of meaning in life, along with its unique dimensions, particularly in an Arabic context. Such validation would be crucial for facilitating cross-cultural research and applications, thereby enhancing understanding of how MIL is experienced globally. Integrating these theoretical perspectives with empirical validation will enrich the discourse on meaning in life, providing deeper insights into the universal and culturally-specific aspects of this psychological construct. Both multidimensional and unidimensional models of the 3DM can provide valuable tools to evaluate meaning in life in health, psychotherapy, and psychology research and practice in an Arabic context.

Therefore, this study attempts to achieve the following goals: 1) to confirm the original three-factor structure of the 3DM in Arabic; 2) to test

whether a bifactor model of the 3DM represents a general meaning in life factor in Arabic; and 3) to analyze the internal consistency scores and intercorrelations of the 3DM.

Method

Participants

A total of 516 Arabic-speaking adult participants were recruited, with an age range of between 18 and 68 years old (M = 31.82; SD = 9.60). 82.9% were women. 204 of the participants were single, 276 married, and 36 divorced. In terms of current or previously obtained educational level, four participants reported primary school level, while 112 had obtained a high school diploma, 136 an undergraduate degree, 180 a master's degree, and 84 a PhD. 16 participants reported a low-level economic status, 464 participants a medium-level status, and 36 participants a high-level status. Four participants were physicians, eight engineers, 52 university staff, 128 university students, 144 participants were not working, and 180 were teachers.

Instruments

Demographics. The form included informed consent, age, gender, marital status, educational level, economic status, and current occupation.

Three Dimensional Meaning in Life Scale (3DM). The 3DM was developed by Martela and Steger (Martela & Steger, 2023), and includes coherence (e.g., "I can comprehend what my life is all about."); purpose (e.g., "I pursue one or more big purposes in my life."); and significance (e.g., "My life is full of value.") subscales. Coherence and purpose include four items, while significance encompasses three. The 3DM items are rated on a seven-point Likert scale from "1 = Not at all true" to "7 = Very true." The instructions read "Please read each of the following items carefully, thinking about how it relates to your life, and then indicate how true it is for you. Use the scale below." The

reliability scores of the 3DM are provided in the Internal Consistency and Interfactor Correlations section.

Translation of the 3DM

The translation of the 3DM followed the principles of the double-translation method as outlined by the International Test Commission (Leong et al., 2016). The 3DM items were translated by two Arabic native speakers from English to Arabic, then two Arabic language specialists and two psychology experts evaluated this version of the items. The revised items were translated by two English-speaking Arabic language specialists, with this version employed in this research. In each step of the translation, the quality and suitability of the items in terms of Arabic grammar and expression were assessed.

Data Collection

Our cross-sectional study used convenience sampling, with the criterion that participants were at least 18 years old. Data were gathered through a Google Forms link. All the participants granted informed consent and their data were used in the analyses. They had the right to withdraw from the study whenever they wanted, and were assured that their data would be anonymous and confidential.

Data Analysis

Jamovi 2.3.21 and JASP 0.18.1.0 were employed to conduct the analyses. No missing values or outliers were found in raw data, although some of the 3DM items did not sufficiently meet multivariate normality on the basis of -2 and 2 for skewness and kurtosis values (Tabachnick & Fidell, 2013). The sample size was higher than the suggestion that 200 participants are sufficient for most confirmatory factor analyses (Kline, 2023).

We performed the following analyses. We first provided the descriptive statistics, skewness, kurtosis, and internal consistency scores

(Cronbach's alpha and omega coefficients), and item-total correlations. Second, we conducted Confirmatory Factor Analysis (CFA) to evaluate the structural validity of the 3DM with single-factor and three-factor solutions. As the items of the 3DM are not normally distributed, we performed the CFA with the Mplus package and Diagonally Weighted Least Squares (DWLS) with robust standard error and listwise deletion. The following fit indices were used to evaluate the CFAs (Hu & Bentler, 1999; West et al., 2012): chi-square, the Comparative Fit Index (CFI), the Tucker-Lewis index (TLI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). The chi-squared/df should be less than 3 to demonstrate good fit, 5 to show acceptable fit, and 10 to indicate marginal fit, while the CFI value should be higher than .85 to demonstrate marginal fit, .90 to show acceptable fit, and .95 to indicate a good fit. The TLI value should be higher than .85 to demonstrate a marginal fit, .90 to show acceptable fit, and .95 to indicate good fit. In addition, the RMSEA should be less than .12 to demonstrate marginal fit, .10 to show acceptable fit, and .08 to indicate a good fit, while the SRMR should be less than .12 to demonstrate marginal fit, .10 to show acceptable fit, and .08 to indicate good fit. Third, as Rodriguez et al. (2016) suggest, we developed a bifactor model of the 3DM by employing a structural equation model with lavaan and DWLS with robust standard error and listwise deletion. The following indices calculated by an Excel formulation were included to evaluate the bifactor model (Dueber, 2017; Hancock & Mueller, 2001): explained common variance (ECV); the percentage of uncontaminated correlations (PUC) omega indices of each factor (ωHS); hierarchical omega indices of the general factor (ωH) and specific factors (ωHS); item-level explained common variance (IECV); factor determinacy (FD); and the H index. Rodriguez et al. (2016) suggest that if ECV and PUC values are higher than

.70, common variance is likely to be uni-dimensional, as it is possible to ignore relative bias. If the omega index of the general factor is > .80 and the hierarchical omega indices of the specific factors are < .50, Reise et al. (2013) maintain that the general score of the items should be considered as unidimensional. Stucky and Edelen (2015) suggest that if IECV values > .80 or .85, this indicates that a set of unidimensional items represents the content of the general factor. The H index value should be >.80 to support an overarching underlying construct (Hancock & Mueller, 2001) and the factor determinacy value should be >.90 (Gorsuch, 1983). Finally, we conducted the analyses for the internal consistency scores of the 3DM by employing Cronbach's alpha and omega coefficients.

Descriptive statistics and internal consistency score analyses were performed using Jamovi 2.3.21, while the confirmatory factor analyses were performed with JASP 0.18.1.0 with Mplus, and the bifactor model was tested through structural equation modeling in Jamovi 2.3.21.

Results

Table 1 shows the descriptive statistics, skewness, kurtosis, and item-total correlations of the 3DM items. The items did not assume multivariate normality as some exceeded -2 or 2 in skewness and/or kurtosis values. The item-total correlations ranged from .46 to .78, demonstrating similarity across the items.

Structural Validity

The structural validity of the 3DM was tested through single-factor and three-factor models. As shown in Table 2, the CFA of the single-factor model indicated partially good fit: χ^2 = 858.773, df = 44, χ^2/df = 19.517, p < .001, CFI = .955, TLI = .944, RMSEA = .190, SRMR = .104, while that of the three-factor model demonstrated good fit: χ^2 = 251.146, df = 41, χ^2/df = 6.125, p < .001, CFI = .988,

TLI = .984, RMSEA = .100, SRMR = .058. The Kaiser-Meyer-Olkin (KMO) test results of the three-factor model were between .78 and .91, while Bartlett's test of sphericity of the three-factor model indicated that the observed variables were correlated. Each parameter was significant, at p < 0.05, which supports the suitability of the data to be used in the factor analyses. The factor loadings of the three-factor model ranged from .61 to .92. Factor correlations were .63 for purpose and significance; .70 for coherence and purpose; and .78 for coherence and significance. The results demonstrate that the 3DM subscales had good fit and represented the underlying constructs.

Table 1

Descriptive Statistics of the 3DM Items

3DM Subscale	Item No	Item	*M*	*SD*	*S*	*K*	Corrected r item-total (α)
Coherence	1	Most things happening in my life do make sense.	4.44	1.40	-0.26	-0.10	.46
	2	By and large, I am able to understand the world around me.	4.78	1.44	-0.56	-0.18	.54
	3	I can comprehend what my life is all about.	5.22	1.31	-1.03	1.18	.69
	4	I can easily make sense of my life.	5.29	1.53	-1.04	0.74	.62
Purpose	5	I pursue one or more big purposes in my life.	6.14	1.11	-1.80	3.56	.68
	6	I am highly committed to certain core goals in my life.	5.55	1.21	-0.86	0.83	.74
	7	I have a set of core goals that give my life a sense of direction.	5.63	1.27	-1.16	1.57	.72
	8	My daily activities are consistent with a broader life purpose.	4.54	1.51	-0.74	-0.06	.61
Significance	9	My life is full of value.	5.56	1.44	-1.39	2.05	.61
	10	My personal existence is significant.	5.59	1.44	-1.37	1.76	.78
	11	Every day I experience the sense that life is worth living.	5.45	1.56	-1.33	1.32	.69

Note. N = 516. M = Mean; SD = Standard Deviation; S = Skewness; K = Kurtosis; α = Cronbach's Alpha.
Skewness Standard Error 0.11; Kurtosis Standard Error 0.21

Table 2

Fit Indices for Confirmatory Factor Analysis of the 3DM Items

Model	χ^2	Df	χ^2/df	CFI	TLI	SRMR	RMSEA	RMSEA 90%CI
Single-factor	858.773	44	19.517	.955	.944	.104	.190	.179 - .201
Three-factor	251.146	41	6.125	.988	.984	.058	.100	.088 - .112

Bifactor Model

The findings indicated that the bifactor model did not support the unidimensional structure of the 3DM, although it did provide adequate fit indices. The bifactor model showed the following fit indices: χ^2 = 3009.127, df = 55, p < .001, CFI = 1.000, TLI = 1.002, RMSEA = .000, SRMR = .034. The explained common variance (ECV) index was .027, which demonstrated that the general factor did not explain the observed variance across all the items. The PUC value was .727; this may lend support to the meaning in life construct conceptualization. The relative omega coefficient was .225 for the general factor, with this value ranging from .358 to .962 for the subscales. The hierarchical omega coefficients ranged from .309 to 16.243 for the subscales, indicating a considerable proportion of reliable subscale-specific variance remaining upon partitioning out the contribution of the general factor, thus providing support for the discriminant validity of the 3DM subscales. As demonstrated in Table 3, the IECV values showed that four items were

applicable as unidimensional items, three of which belonged to the subscale of coherence. The H index was .896 and FD was .926, which demonstrated high correlations between the subscales and the general factor, together with a well-defined latent construct. Overall, although the bifactor model provides good fit indices, it does not support the unidimensionality of the Arabic 3DM and indicates the multidimensional structure of the 3DM as in the original version.

Internal Consistency and Inter-correlations

The internal consistency coefficients of the 3DM subscales were good. The reliability scores indicated adequate levels: coherence (α = .77; ωh = .78); purpose (α = .84; ωh = .85); and significance, (α = .83; ωh = .84). In addition, the Guttman split-half reliability of the subscales showed good internal consistency, at .78; .84; and .76. respectively in terms of the inter-correlations, coherence had moderate positive associations with purpose (r = .61, p < .001) and with significance (r = .61, p < .001), while purpose had a moderate positive association with significance (r = .52, p < .001).

Table 3

Factor Loadings and Coefficients of the 3DM Bifactor Model

Item	3DM General	Coherence	Purpose	Significance	IECV
Item 1	.528	.005			*1.000*
Item 2	.712	.025			.999
Item 3	.652	12.354			.003
Item 4	.567	.008			*1.000*
Item 5	.618		.609		.507
Item 6	.663		.582		.565
Item 7	.560		.472		.585
Item 8	.579		.362		.719
Item 9	.494			.397	.608
Item 10	.584			.626	.465
Item 11	.859			.425	*.803*
PUC	.727				
ECV	.027				
FD	.926				
H	.896				

Note. IECV = Item-level Explained Common Variance; ECV = Explained Common Variance; PUC = Percent of Uncontaminated Correlations; FD = Factor Determinacy; H = H Index.

Discussion

The results demonstrate that the Arabic 3DM replicated the original three-factor solution among Arabic-speaking adults. The 3DM fitted well to the data, while the confirmatory factor analysis supported its structural validity. The findings were in line with previous versions of the 3DM in English, German and Turkish (Beyer, 2023; Martela & Steger, 2023; Subasi et al., 2024a, 2024b). However, unlike the German 3DM, the one-factor model of the Arabic 3DM had partially good fit.

The results show that the bifactor model of the 3DM had good fit indices; however, it did not support the measurement of meaning in life through coherence, purpose, and significance items as a higher-order construct. This is congruent with the 3DM model, as it considers meaning in life to be a multidimensional construct. Martela and Steger (2016, 2023) suggest that each facet of the 3DM is distinct, but comprises interrelated dimensions contributing to an overall sense of MiL. Therefore, it is theoretically consistent with the 3DM framework that these dimensions do not support a unidimensional measurement, because of MiL being composed of several dimensions.

Similar to our results, the bifactor model of the Turkish 3DM was not supported (Subasi et al., 2024a). This provides further support for the multidimensionality of the 3DM when considering Turkish and Arabic cultures. However, the bifactor model of the Turkish MEMS did provide evidence for the unidimensional measurement of the MEMS (Subasi et al., 2024b). Unlike the 3DM, the MEMS can be measured as a unidimensional construct in some cultures. It suggests that the MEMS subscales may be more interrelated and appear to contribute to an overall sense of MiL. However, the MEMS subscales may not be as distinct as those in the 3DM. The conceptual differences between the 3DM and the MEMS may account for the variations

in the models. The MEMS may exhibit higher interdependence, which enables it to represent an overarching construct of MiL in comparison to the 3DM. Further research is needed to compare the 3DM and MEMS in an Arabic context. Our research was the first study to test the 3DM through a bifactor model, which lends support to the multidimensional structure of meaning in life in Arabic.

The 3DM subscales had good reliability, ranging from .77 to .85; the original 3DM reliability scores ranged from .89 to .92 (Martela & Steger, 2023), while those of the German version ranged from .75 to .84 (Beyer, 2023), and those of the Turkish version from .88 to .89 among university students and from .76 to 81 among adults (Subasi et al., 2024a, 2024b). Despite being slightly lower than those of previous findings, the reliability scores of the Arabic 3DM were adequate.

In terms of interfactor correlations, previous research has predominantly demonstrated moderate positive associations among the factors. The subscales of the original version had high positive associations, while those of the German version had moderate positive associations between themselves (Beyer, 2023). The subscales of the Turkish version similarly showed moderate positive associations among adults (Subasi et al., 2024b), and mainly strong positive associations among university students (Subasi et al., 2024a). In line with previous findings, the Arabic 3DM had mainly moderate positive associations between its factors. Characteristics of the sample (e.g., age and education) and cultural differences may explain the different associations among the factors. Different backgrounds among Arabic-speaking people may shape how they interpret and prioritize significance, purpose and coherence. The collectivist structure of Arabic culture may lead to these differences, since intergroup needs such as family and community are prioritized. Arabic people may be more inclined to derive their sense of purpose from their social connections and

belongings, while their strong emphasis on cultural values (e.g., family honor in society and shame avoidance) can affect their understanding of coherence, purpose, and significance. The value of low-arousal emotions (e.g., contentment) in Arabic and the perception that meaning is a shared experience may influence meaning in life. Therefore, these factors may help explain why the 3DM exhibits different correlations across studies. Our results align with the emphasis of positive psychological approaches on the multifaceted nature of meaning in life, an indicator of well-being. The dimensions of the 3DM are essential for fostering a sense of meaning and contributing to a fulfilling life, as underlined by positive psychological frameworks. Likewise, the multi-dimensionality of the 3DM in relation to the MiL construct emphasizes the importance of achieving coherence, purpose, and significance, and of need-satisfying experiences on the path to a meaningful and psychologically rich life, as highlighted by SDT.

However, the cross-sectional nature of this research is a limitation to causality. The study does not measure different types of validity (e.g., convergent validity or divergent validity), nor evaluate test-retest reliability. The research used a convenience sampling strategy and included Arabic-speaking adults, which would limit the generalization of the findings to diverse populations and contexts. The lack of support for convergent and divergent validity does not allow evaluation of the meaning in life construct with reference to related and unrelated concepts, despite the presence of strong evidence for the structural validity and the bifactor model of the 3DM. This limits the measurement of the overlap and distinguishing features of the 3DM in relation to other constructs of meaning in life and theoretically related constructs.

Further research could utilize longitudinal designs to evaluate the psychometric properties of the 3DM in an Arabic context and how participants' responses differ over time. Such studies should especially address the convergent and divergent validity of the 3DM with meaning in life, well-being, and psychopathology measures. Research could be conducted with diverse populations (e.g., emerging adults or older adults) to explore the factor structure of the 3DM. Studies could also seek to explore the differences and similarities between multidimensional models, such as the Multidimensional Existential Meaning Scale (Martela & Steger, 2023); the Quadripartite Existential Meaning Scale (Li et al., 2021); and Multidimensional Meaning in Life (Costin & Vignoles, 2020). As the conceptualization of significance requires further refinement, comprehensive measures of significance or mattering such as perceived mattering scales, could be developed (Prinzing et al., 2023). Future research on meaning in life could also inform various areas of science and practice (e.g., positive psychology and suicide prevention interventions).

Overall, the limitations outlined above should accordingly be addressed in further research in terms of validity. Samples should be diversified to represent the general Arabic population, while cultural dimensions of Arabic contexts should be explored in detail to understand how they affect meaning in life. Further research is also recommended to provide empirical support for the distinguishing features of the 3DM and its overlap with other constructs among Arabic people from different backgrounds. Ultimately, the research could test which meaning in life measure is more suitable for the Arabic context.

Conclusion

In conclusion, the study has successfully confirmed the three-factor structure of the 3DM among Arabic-speaking adults, demonstrating evidence of its structural validity, with findings similar to those in previous results focusing on different languages and cultures. The Arabic 3DM supports the multidimensional measurement of

the 3DM in line with previous research and the 3DM framework but did not support the bifactor model of MiL. The internal consistency scores of the Arabic 3DM are adequate despite being slightly lower than those of previous adaptations. The Arabic 3DM offers valuable insights into its psychometric properties in Arabic. The results demonstrate that coherence, purpose and significance play crucial roles as dimensions of MiL, and that they are effectively measured by the 3DM in Arabic. It can also be employed as a culturally sensitive global tool in psychotherapy, health, psychoeducation, and suicide prevention research and applications in an Arabic context.[]

Acknowledgment

Author Contribution Statement

Sayed Ahmed Elwakeel: Conceptualization; Investigation; Methodology; Resources; Writing Original Draft. **Mustafa Subasi:** Formal Analysis; Investigation; Methodology; Writing Original Draft. **Maha Al-Hendawi:** Validation; Writing, Review & Editing. **Sefa Bulut:** Conceptualization; Writing, Review & Editing.

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