

Development and Validation of a Spinsterhood Anxiety Scale for Diagnosing Anxiety among Unmarried Arab Girls

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Article Information:

Received 2025-07-28

Revised 2026-03-10

Published 2026-03-31

Keywords:

Anxiety, Factorial analysis,
Reliability Spinsterhood, Validity

Abstract

Despite growing social concern about delayed marriage in Arab societies, no validated Arabic instrument has been available to assess anxiety specifically associated with spinsterhood. Existing measures of general anxiety, depression, or well-being do not adequately capture the culturally specific family, religious, personal, and social meanings attached to unmarried status in this context. This study aimed to develop a tool to diagnose spinsterhood anxiety among Muslim girls. A group of experts (n=26) evaluated these items to verify content validity. The items were shortened to 29 items. Two separate samples were subsequently selected: the first was used for exploratory factor analysis (EFA), while the second was used for confirmatory factor analysis (CFA). The results revealed that 26 items explained five factors, representing 72.30% of the total variance. These factors were named family, personal, physical, sexual, and financial. The results also showed that the CFA provided positive confirmation of convergent validity and reliability, with significant evidence to support these statistics for the relationships between the Spinsterhood Anxiety Scale (SAS) and the Beck Depression Inventory Arabic Version (BDI-ArV), Beck Anxiety Inventory Arabic Version (BAI-ArV), Well-Being (WB), and Arab Scale of Mental Health (ArS-MH) scales. Cronbach's alpha values for the five factors ranged between 0.88 and 0.75, while the total score was 0.91. The correlations between the SAS and the five factors were also significant. The scale predicted 79% of all BDI-ArV, BAI-ArV, WB, and ArS-MH. The study concluded that the SAS has suitable psychometric properties for diagnosis.

INTRODUCTION

The term “spinsterhood” is widely used in Arab and Islamic societies. However, late marriage in Western societies may not have the same negative effects as those experienced by girls in Arab and Islamic societies (Kitayama & Cohen, 2007; Rashad et al., 2005; Yacoub et al., 2011). Many studies indicate that the mortality rate for many causes is higher among unmarried people than among married people (Kravdal et al., 2018). On the other hand, marriage is associated with a lower mortality rate and helps in leading a healthier life and living for a longer period of time (Franke & Kulu, 2018), as well as recovering from many physical and psychological diseases (Brockmann & Klein, 2004). The benefits of marriage and its impact on mental and psychological health have been documented over the past half-century, while in many countries, the age of marriage has increased alongside rising rates of never marrying. Other forms of marriage have emerged, such as joint, civil, and customary marriage (Kravdal et al., 2023; Sassler & Lichter, 2020).

Spinsterhood is defined as a woman who has not married and is still a virgin in her father's house, waiting for marriage, and who has reached the age of 30 years or above (Rashad et al.,

How to cite:

Aldahadha, B., & Al Dwakat, M. (2026). Development and Validation of a Spinsterhood Anxiety Scale for Diagnosing Anxiety among Unmarried Arab Girls. *Islamic Guidance and Counseling Journal*, 9(1). <https://doi.org/10.25217/0020269760700>

E-ISSN:

2614-1566

Published by:

Institut Agama Islam Ma'arif NU (IAIMNU) Metro Lampung

2005; Yacoub et al., 2011). It is a description given to men and women, but women are more affected by this stigma compared to men because men can search for a wife, take the initiative, and have more freedom compared to women, who wait for a suitable husband to propose (Al-Bahnsawy, 2018; Shousha et al., 2022). There are legal definitions of spinsterhood and other social definitions. From a legal perspective, a single person is classified as a person who has never been married, while from a social perspective, a single person is defined as a person who does not have a partner, whether a wife, husband, or any other relationship (Parker, 2015).

Compared with married people, Sharafoddin's study (2018) revealed that unmarried people suffer from addiction problems and suicidal tendencies. Kajbaf et al.'s study (2008) also revealed that single women and unmarried men aged 32 to 42 years were more prone to depression, social ostracism, and greater anxiety about their financial future and personal independence. In contrast, married people feel satisfied and calm, that they belong to people whom they love and live with, and that they are committed to a more satisfying sexual relationship compared to unmarried people.

In contrast, the results of other studies have shown that the rate of psychological disorders among people who have never married is lower than that among married people; these results can be attributed to the absence of marital problems and family responsibilities resulting from marriage (Adamczyk, 2017; Noorbala et al., 2017). Notably, there is no published study worldwide entitled the Spinsterhood Anxiety Scale (SAS). Most of the previous studies focused on the spinsterhood rate (Al-Momani, 2022), the stigma of spinsterhood (Shousha et al., 2022), attitudes toward spinsterhood (Herouach, 2018), celibacy (Budgeon, 2016), and the health and psychological harms of spinsterhood (Fekih & Mounis, 2017).

Rationale for Current Study

Marriage in Arab societies has social, religious, and cultural specificity, as marriage and family formation are considered necessary things that an individual must do in his life. It is the way of life and a developmental requirement through which the individual obtains social acceptance and fulfills half of religion. Socialization processes and Arab and Islamic culture support the idea that marriage and family stability are the dreams of every girl, while a woman who has never married has violated traditions, customs, and social roles. For these reasons, and because of the lack of men willing to marry, spinsterhood has become a regional phenomenon in all Arab countries (Al-Bahnsawy, 2018). The results of a comprehensive survey conducted in the Arab community in several countries revealed that spinsterhood ranks second in terms of prevalence after the phenomenon of divorce. The percentage of spinsterhood in Jordan reached approximately 42%, while the highest percentage was in Lebanon, at 85%. There are approximately one million single women in Jordan who are over 30 years old (Al-Momani, 2022). There are 15 million girls over 30 years old who have never been married in Egypt (Shousha et al., 2022).

The importance of this study stems from the need for an Arabic scale that helps diagnose the anxiety of unmarried girls over the age of 30, as this instrument will provide a great opportunity to conduct more diagnostic, therapeutic, and predictive studies. It will also help reduce anxiety and psychological pressures that affect unmarried girls. The importance of this study is evident from the high rate of spinsterhood in Arab countries and the fact that there is a major dilemma among most Jordanian and Arab families, noting that the topic of spinsterhood has received great attention, as most social media sites and forums are full of discussions about the phenomenon due to its family, health, and religious consequences. Notably, no Arab or non-Arab research has contributed to the development of a tool to diagnose spinsterhood anxiety among unmarried girls.

Study Objectives

This study aimed to construct an SAS for unmarried girls aged 30 years and above, according to the foundations of the scientific method for constructing health and religion scales (Koenig & Al Zaben, 2020). This study aims to open the way for conducting more studies in the future to determine the nature of this problem and its symptoms. The four-stage scale was adopted (Aldahadha, 2023; Aldahadha et al., 2019; Drummond & Carey, 2019; Koenig & Carey, 2024) with the aim of avoiding random answers that often tend toward the middle as a choice chosen by many respondents. This research consisted of three basic stages that together constitute seven partial stages (see Figure 1). The first three colors in blue represent the first basic stage, the green color indicates the second basic and partial stage, and the last three partial stages in yellow indicate the third basic stage. The first three stages involved apparent validity, which was represented by presenting the scale items to a list of experts. The second stage was represented by exploratory factor analysis (EFA). Finally, the third stage, which included the other three stages, was represented by CFA, including reliability and validity procedures.

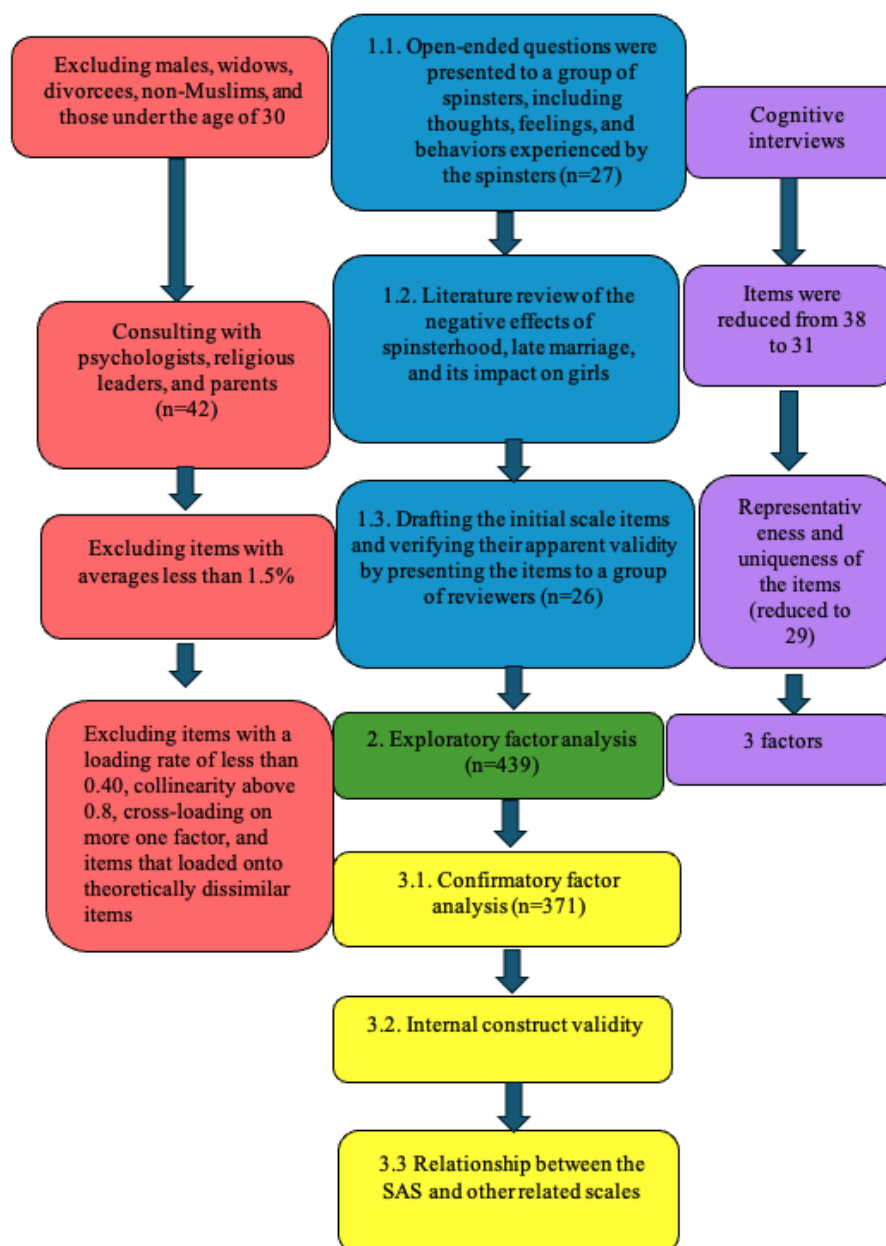


Figure 1. SAS development stages

METHODS

Cognitive Interview

The initial scale items, which were recruited from the pool of items, were presented to a sample of experts and specialists in the field of measurement and evaluation, as well as religious men, all of whom are academics working in Jordanian universities. They were asked to evaluate the extent to which these items fit the definition of spinsterhood anxiety mentioned above, the extent to which the linguistic formulation is correct and appropriate for the Arab environment, and the degree to which these items measure what they were designed to measure. They were also asked to modify the items as needed, delete or add what is necessary, and write any comments.

We contacted 27 spinsters over the age of 30, using the available data and our personal knowledge of them, their parents, and their families, to conduct an in-person cognitive interview (Boeije & Willis, 2013). The interviews were conducted via mobile phone and, in a few cases, via email. The objectives of the interviews were clearly stated, and confidentiality was maintained. As a next step, these questions were posed to another group of psychologists ($n=9$), religious leaders ($n=13$), and parents ($n=20$) of the spinsters. All the cognitive interviews were conducted after obtaining consent to participate. \$14 was allocated to each interviewee, which was transferred to their financial accounts using their mobile phone numbers.

Study Design

The SAS was developed in 7 stages (see Figure 1). In the first stage, open-ended questions were asked to a group of spinster girls ($n=27$) over the age of 30 who had never been married. The questions included the following: What are the thoughts, feelings, and behaviors that a spinster experiences, and how does she view the future? What are the effects that she feels and that affect her? The second phase involved reviewing the research literature, particularly in the Arab context and religious studies, on the effects of spinsterhood, the negatives of late marriage, and the feelings of anxiety experienced by spinsters (Shahrak et al., 2021). During this phase, these questions were posed to another group of psychologists, religious figures, and parents of spinsters to gain insights into the ideas and items that could be relied upon to develop the study tool. A total of 38 initial items were created for the SAS based on its operational definition, which is “the negative feelings, thoughts, and behaviors in the future and present that afflict spinsters due to their unmarried status, who have never been married before, are still a virgin, and are over 30 years old.” The third phase consisted of formulating the scale items from the aforementioned sources and verifying the apparent validity procedures, which consisted of presenting the scale items to a group of arbitrators ($n=26$) to express their opinions and judgments regarding the degree of representativeness, uniqueness, technical competence, and comprehension of the items.

In the fourth stage, the SAS was evaluated through EFA on an independent sample designated for this analysis. In the fifth stage, confirmatory factor analysis (CFA) was explored using another independent sample, with a time interval of at least 10 days from the application of the EFA sample. Demographic data were taken from both samples, and all study tools, including the checklist extracted from the EFA, were applied. In the sixth stage, CFA data were used, and internal construct validity was calculated, including Cronbach's omega coefficient and mean interitem correlations, as well as the test–retest reliability coefficient over a three-week period in a subset of CFA participants. Finally, the seventh stage was dedicated to verifying the validity of the relationship between the SAS and the tools used, including discriminant validity and predictive validity.

Online Research Participants

There were 439 participants in the first phase of the EFA and 371 participants in the second phase of the CFA, all of whom were unmarried girls over 30 years old. The sample was considered to be as diverse and comprehensive as possible for Arab nationalities. The links to these tools were sent through all social media sites. They were asked to complete these tools, stressing that they are confidential and that the identities of the respondents cannot be known or even disclosed to any other party. The demographic variables related to the participants' characteristics (e.g., gender and age) were also identified. Male participants, girls under 30 years old, divorced or widowed women, and non-Muslims were excluded.

There was a two-week period between applying the tools for the purposes of the EFA and the second round, which was the application of the tools to obtain data for the CFA. On the other hand, the following two questions were posed to the study sample: "If a married man proposed to you and he was characterized by good morals, religiosity, knowledge, and wealth, would you agree to marry him?" The second question was "Do you regret a marriage opportunity that you had in the past and did not agree to?" The purpose of these two questions was to explore the extent to which girls, especially spinsters, desire to become a second or third wife and to identify the marriage opportunities that some girls have lost in the past, which has led to feelings of frustration and the sense of missing the marriage train; see Table 1 for more information about the demographic characteristics of the study sample. The mean age of the study sample was 33.22 years (SD = 11.62, range 30–42, $n = 0$ missing).

Table 1. Participant characteristics ($n=810$).

Variables	N (%)
<i>Nationality</i>	
Jordanians	326 (40.25%)
Egyptians	195 (24.07%)
Syrians	126 (15.55%)
Iraqis	108 (13.33%)
Others	55 (6.80%)
<i>Age</i>	
30–37	362 (44.69%)
38–45	275 (33.95%)
Over 46	173 (21.36%)
<i>Qualification</i>	
Diploma and below	187 (23.09%)
Bachelor	354 (43.70%)
Master and doctorate	269 (33.21%)
<i>Family salary (monthly)</i>	
Below 500JD	409 (50.49%)
500-800JD	311 (38.40%)
Over 800JD	90 (11.11%)
<i>Vocational</i>	
Work in the public sector	162 (20.00%)
Work in the private/personal sector	389 (48.02%)
Do not work	259 (31.98%)
<i>If a married man with excellent qualities loves you, would you agree to marry him?</i>	
Yes	393 (48.55%)
No	355 (43.86%)
Not sure	62 (7.59%)
<i>Do you recall dismissing a marriage opportunity that was offered to you in the past because you did not agree to it?</i>	
Yes	389 (48.02%)
No	234 (28.89%)
Not sure	187 (23.09%)

Instruments

Beck Depression Inventory Arabic Version (BDI-ArV) (Beck et al., 1996): This scale is a version of a checklist that is widely used in the Arab academic community. It was subsequently translated into Arabic (Aldahadha, 2021). It consists of 21 items scored on a scale from 0 to 3, with 0 indicating no symptoms and 3 indicating very severe symptoms. Therefore, the highest score for this scale ranges from 0 to 63. This scale, in its Arabic version, achieved appropriate psychometric properties when applied to a sample of students at the University of Jordan. This scale distinguished between depressed and nondepressed students. Reliability values were also appropriate. A test-retest test was performed, and the result was 0.87 for a sample of male and female students at the University of Jordan (n=635), while the Cronbach's alpha for the total score was 0.90.

Beck Anxiety Inventory Arabic Version (BAI-ArV) (Al-Issa et al., 2000): This scale aims to assess anxiety levels in adults. It is an exact replica of the Beck and Steer (1990) scale. It is a self-report scale that has been standardized for the Arab context and has been widely used in Arab research. It is answered on a four-point scale ranging from 0 to 3, with 3 indicating a high degree of anxiety symptoms and 0 indicating a very low degree of anxiety symptoms. Therefore, the range of responses to this scale ranges from 0 to 63, with a higher score indicating a greater degree of anxiety. 36 is considered the cutoff point between the most anxious and the least anxious. This scale has excellent psychometric properties, and the Cronbach's alpha for the total score was 0.92.

Well-being (WB) (Tennant et al., 2007): This scale consists of 14 items, which together form a single-item scale. It is answered on a five-point scale ranging from 0 to 4, with 0 indicating never and 4 indicating daily. Scores on this scale range from 0 to 56, with the highest score indicating the greatest value and 0 indicating the lowest value. The higher the score is, the greater the number of indicators with a higher level of WB. Note that all items on this scale are in the positive direction, and a score of 30 is considered a cutoff point between those who enjoy WB and those who suffer from a lack of WB indicators. Examples of items on the scale include "I feel I have extra energy"; "I deal with problems efficiently and powerfully"; "I always think clearly and positively"; and "I feel satisfied with myself." This scale has demonstrated appropriate psychometric properties and has been used in numerous international studies. It has been translated into several languages, including Arabic. Cronbach's alpha was calculated for the total score and was 0.87 (Aldahadha, 2020).

Arab Scale of Mental Health (ArS-MH) (Abdel-Khalek, 2011): This scale is one of the best and most widely used scales in the Arab world. It was developed to suit a wide age range, particularly adolescents and adults. To obtain its psychometric properties, it was administered to a sample of 3,619 individuals aged 15 to 71 years. EFA and CFA were conducted, and six factors were derived, including satisfaction, self-confidence, optimism, enjoyment, meaning in life, and stability. The scale demonstrated a high degree of reliability and stability, ranging from 94 to 96%. The stability value after 10 days of application ranged from 84 to 94%. The results revealed a very high correlation between the scale and several other scales, such as life satisfaction, hope, optimism, and self-actualization (Aldahadha, 2023).

Procedures

Data were collected between January 2025 and February 2025. The participants were directed to fill out the scales through a survey sent to them via a Qualtrics link. This link was sent through various social media sites. It was also sent to followers who have social fame in Egypt, Syria, Iraq, and Lebanon. An amount of \$500 was paid to accounts with more than 200,000 followers. The study tools were published over several periods, and each time, they were charged the same amount. These tools initially contained all the demographic variables indicated in Table 1, noting that the target group is spinster girls. It was also emphasized that

the procedures of this research are for scientific purposes and that the identities of the respondents will not be revealed.

The respondent does not necessarily have to mention any information that indicates her identity, name, or any other personal details, in compliance with the ethics of scientific research and to maintain the confidentiality and privacy of the participants. Finally, the procedures of this research have been approved by the educational institution in which the authors work. Three samples were selected for this study. The first sample was for EFA, the second sample was for CFA, and the final sample was for convergent validity and reliability. There was a time difference of at least two weeks between each sample.

The sources of sample recruitment were different and diverse each time (Aldahadha, 2023; Cappelleri et al., 2013; Koenig & Al Zaben, 2020; Koenig & Carey, 2024). Approval for conducting this research was obtained from the Deanship of Scientific Research through grant number 2025/1019, in accordance with the ethics of scientific research as outlined by the American Psychological Association and the Declaration of Helsinki 1970 (American Education Research Association, American Psychological Association, and the National Council on Measurement in Education, 2014).

Data Analysis

A value of 1.5 was adopted as a minimum for accepting the items, which was agreed upon by the arbitrators and experts. In a previous step, an appropriate value of 0.6 or above was adopted for the EFA based on the Kaiser–Meyer–Olkin (KMO) sampling measure and a significant p value ($p > .05$) in Bartlett’s test of sphericity (Tabachnick & Fidell, 2013). Kaiser’s criterion retains factors with eigenvalues greater than one (Kaiser, 1960). The factors were rotated using oblique rotation (Promax method), and the factors were expected to be correlated. Item retention was psychometrically conducted using the pattern matrix factor loadings and the correlation matrix; the criteria for item removal included factor loadings below 0.40, collinearity above 0.8, cross-loading on more than one factor, and items that loaded onto theoretically dissimilar items (Hair et al., 2014). Model fit was assessed using the root mean square error of approximation criteria (RMSEA), with values close to 0.06 or lower; the comparative fit index (CFI) and the Tucker–Lewis index (TLI), with values approximately 0.95 or above; and the standardized root mean square residual (SRMR), with values close to 0.08 or below (Hu & Bentler, 1999).

RESULTS

Face validity

The results of Table 2 show that all 31 items had an average above the standard of 1.5 and that there were only two items that did not meet the required standard, which were deleted from the list: “I suffer from deformities in my body that prevent me from getting married” and “Raising children bothers me, which makes me worried about getting married.”

The results of the correlations between the items were statistically significant ($r(31) = .90$, $p < 0.001$), and the average response to the question was also high, i.e., 2.64, which is an acceptable value. Accordingly, these 29 items were adopted as items for the SAS. Therefore, we can continue to check the psychometric properties of the scale through EFA and CFA.

Exploratory factor analysis results

The KMO value was 0.92, and the Bartlett test ($p < .001$) showed that the result was fit and suitable for continuing the factor analysis. The results of the basic factor analysis indicated the extraction of five factors with eigenvalues greater than one after extraction and before rotation, as supported by parallel analysis. The five-factor solution explained 72.30% of the variance (Factor 1: 40.76%, Factor 2: 13.28%, Factor 3: 9.07%, Factor 4: 5.97%, and Factor 5:

3.22%). An EFA (principal axis factoring) test was conducted to confirm the presence of five factors, provide further interpretation (promax rotation), and confirm the results. The fixed five factors explained 67.84% of the variance (Factor 1: 41.40%, Factor 2: 10.17%, Factor 3: 7.61%, Factor 4: 5.35%, and Factor 5: 3.31%) (see factor loading in Table 3).

Table 2. Representativeness and uniqueness of the SAS mean of experts

Items	Unique	Representative
I worry a lot that I won't complete my life with a partner.	1.77	1.93
I fear that I will spend my life alone without a family.	1.54	1.63
I fear that I won't get married and have children.	1.65	1.84
I need to love or be loved.	1.74	2.75
I want to be a mother to children.	2.23	2.09
I worry a lot that my future will be uncertain.	2.13	2.00
I fear failing in marriage in the future.	1.60	1.77
I am afraid that I will get married and become an unsuccessful mother to my children.	1.88	1.63
I have recurring insecure thoughts because I am not married.	2.10	2.31
I fear that I will be a financial burden on my parents and siblings.	1.69	2.54
I feel hopeless and anxious.	1.94	2.56
I feel guilty because I didn't take advantage of previous marriage opportunities.	1.53	2.31
I worry that I am not meeting my sexual needs.	2.02	1.69
I often ignore my sexual needs.	2.18	1.95
I am very bothered by the label of "spinster" in society.	2.20	2.13
I think a lot about my future self and how I will be.	1.98	2.71
I am very concerned about my future physical and mental health.	1.69	1.78
I am very disturbed by thinking about financial matters and how I will meet my basic needs.	2.57	1.97
I am anxious because I am unemployed.	2.15	1.64
I am very anxious because my money will go to someone other than my children after my death.	1.52	2.36
I need a life partner to help me manage my financial affairs.	2.36	2.01
Loneliness and not having a life partner are disturbing to me.	2.44	1.99
I am afraid of aging and not having children to care for me.	2.29	2.53
I am afraid of becoming disabled or suffering from a physical illness and being unable to care for myself.	1.95	1.80
I view spinsters as more susceptible to physical illness.	1.71	1.86
I am concerned that I am single and that married women are healthier.	1.90	2.01
I am afraid of developing breast cancer due to spinsterhood.	1.76	1.97
I often avoid situations that arouse my sexual urges.	1.69	2.14
I am afraid of remaining a virgin and never getting married.	2.14	2.50

Two items that did not achieve the minimum load of 0.40 were deleted: "I am very anxious because my money will go to someone other than my children after my death," and "I view spinsters as more susceptible to physical illness." One item cross-loaded on more than one factor: "Loneliness and not having a life partner are disturbing to me." The results revealed that 26 items were distributed over five factors. The first was named the family factor and consists of six items. The second factor, which was named the personal factor, consists of six items. The third factor, which consists of five items, was named the physical factor. The fourth factor was named the sexual factor and consists of five items. Finally, the fifth factor consists of four items and is named the financial factor.

Table 3. EFA for five factors

Items	Family	Personal	Physical	Sexual	Financial
I worry a lot that I won't complete my life with a partner.	0.763				
I fear that I will spend my life alone without a family.	0.468				
I fear that I won't get married and have children.	0.724				
I want to be a mother to children.	0.611				
I fear failing in marriage in the future.	0.781				
I am afraid that I will get married and become an unsuccessful mother to my children.	0.584				
I worry a lot that my future will be uncertain.		0.605			
I have recurring insecure thoughts because I am not married.		0.668			
I feel hopeless and anxious		0.750			
I feel guilty because I didn't take advantage of previous marriage opportunities.		0.589			
I am very bothered by the label of "spinster" in society.		0.730			
I think a lot about my future self and how I will be.		0.837			
I am very concerned about my future physical and mental health.			0.443		
I am afraid of aging and not having children to care for me.			0.742		
I am afraid of becoming disabled or suffering from a physical illness and being unable to care for myself.			0.635		
I am concerned that I am single and that married women are healthier.			0.601		
I am afraid of developing breast cancer due to spinsterhood.			0.591		
I need to love or be loved.				0.489	
I worry that I am not meeting my sexual needs.				0.817	
I often ignore my sexual needs.				0.643	
I often avoid situations that arouse my sexual urges.				0.622	
I am afraid of remaining a virgin and never getting married.				0.609	
I fear that I will be a financial burden on my parents and siblings.					0.621
I am very disturbed by thinking about financial matters and how I will meet my basic needs.					0.559
I am anxious because I am unemployed.					0.605
I need a life partner to help me manage my financial affairs.					0.452

Conformity Factor Analysis

The one-factor model and the five-factor model were used to verify the validity of the factors. The results showed that the one-factor option was weak and did not fit the data or the scale items (CFI=0.761, TLI=0.753, RMSEA=0.143, SRMR=0.096) compared with the five-factor model, which showed a good fit, as shown in Table 4 (CFI=0.922, TLI=0.929, RMSEA=0.082, SRMR=0.056). The correlations revealed that there was a relationship between the items of the second factor, between the second and sixth items, and between the third and fifth items. With respect to the fourth factor, there was a relationship between the first and fifth items.

Table 4. Fit of the single- and five-factor models in the CFA.

Model	χ^2 (df)	CFI	TLI	RMSEA	SRMR	p
Single factor	958.804 (423)	0.761	0.753	0.143	0.096	< .001
Five factors	852.084 (356)	0.922	0.929	0.082	0.056	< .001

χ^2 = Chi square, TLI = Tucker–Lewis index, RMSEA = Root mean square error of approximation, CFA = Confirmatory factor analysis, CFI = Comparative fit index, SRMR = Standardized root mean square residual.

Convergent validity

The results of the Pearson test revealed statistically significant correlations between the SAS and its five factors with all the scales used in this study. These scales included BDI-ArV, BAI-ArV, WB, and ArS-MH, with values ranging between 0.46 and 0.84 for each of the total scores of the scale and its five factors. All values were significant at $p < 0.01$ (see Table 5)

Table 5. Convergent validity of the SAS and its factors with the BDI-ArV, BAI-ArV, WB, and ArS-MH scales.

Scale	Family	Personal	Physical	Sexual	Financial	SAS
BDI-ArV	0.597	0.570	0.651	0.687	0.537	0.841
BAI-ArV	0.704	0.601	0.479	0.577	0.670	0.708
WB	- 0.536	- 0.763	- 0.590	- 0.484	- 0.706	- 0.630
ArS-MH	- 0.660	- 0.710	- 0.730	- 0.459	- 0.552	- 0.672

BDI-ArV= Arabic Version of Beck Depression Inventory, BAI-ArV = Arabic Version of Beck Anxiety Inventory, WB=Well-Being, ArS-MH = Arab Scale of Mental Health.

Table 6. Correlations between the total SAS score and related factors.

Correlate	SAS	Family	Personal	Physical	Sexual
SAS	-				
Family	0.537	-			
Personal	0.670	0.740	-		
Physical	0.706	0.573	0.611	-	
Sexual	0.552	0.682	0.700	0.685	-
Financial	0.497	0.508	0.571	0.609	0.534

Reliability

To verify reliability, Cronbach's alpha coefficient was extracted to determine the stability of the SAS. The split-half reliability equation and the test-retest coefficient were used for the total SAS score and its five factors. The results revealed that the SAS had a reliability ranging between 0.79 and 0.87 for the total SAS score and its five factors. Notably, these values were statistically significant at $p < 0.01$, indicating the stability of the scale over different periods of time. On the other hand, the McDonald's omega coefficient equation was used, and the results revealed that its values were 0.90 for the total SAS score, while the values ranged between 0.80

and 0.91 for the five factors. The test–retest reliability coefficient was 0.87 for the total score. Finally, Pearson’s test was used to determine the relationships between the SAS and its five factors, and the results revealed significant correlations, ranging from 0.53 to 0.74 ($p < 0.01$) (see Table 6).

Predictive power of the SAS

To verify the predictive ability of the SAS for each of the BDI-ArV, BAI-ArV, WB, and ArS-MH scales, a hierarchical regression analysis was conducted, with the SAS variable considered an independent variable and the previous measures considered dependent variables. The results of the regression analysis show that in the first step, the variables of age and income were entered with the aim of neutralizing them and controlling their effects, and it was found that they explained 2% of the predictive ability of the SAS. In the second step, BDI-ArV was added alone, and it explained 6% of the predictive ability of the SAS. In the third step, BAI-ArV was entered, and as a result, the predictive ability of the SAS increased to 31%. In the fourth step, the WB variable was added, and the percentage of the predictive ability of the SAS increased to 52%. Finally, in the fifth step, the ArS-MH variable was added, and the predictive ability of the SAS also increased to 79%. All these predictions were statistically significant at $P < 0.01$, except for the variables of gender and income. Thus, there is a strong relationship between the SAS and each of the related dependent variables, i.e., BDI-ArV, BAI-ArV, WB, and ArS-MH.

Table 7. Hierarchical regression analysis with the SAS, age, income, and study instruments ($n=284$).

Models	F	ΔR^2	R^2	β	t
Step one: Age * Income	9.16		0.02	0.10	-3.78
Step two: BDI-ArV	3.21*		0.06	-0.38	0.69
Step three: BDI-ArV * BAI-ArV	159.08*	0.25	0.31	0.33	12.09
Step four: BDI-ArV * BAI-ArV * WB	224.13*	0.21	0.52	0.58	15.31
Step five: BDI-ArV * BAI-ArV * WB * ArS-MH	259.54*	0.27	0.79	0.84	17.47

ΔR^2 = Difference between the models, BDI-ArV= Arabic Version of Beck Depression Inventory, BAI-ArV = Arabic Version of Beck Anxiety Inventory, WB=Well-Being, ArS-MH = Arab Scale of Mental Health, * $p < 0.01$.

DISCUSSION

This study aims to construct a scale with valid and reliable psychometric properties to diagnose the symptoms of spinsterhood anxiety among Muslim girls in the Arab world who are 30 years and older. It is a new scale that has never been developed before anywhere in the world, to the best of the researchers’ knowledge. This scale was developed according to several stages. The first was through verifying the validity of the content.

In the beginning, some spinster girls discovered the thoughts and feelings that afflicted them and caused their apprehension and fear of the future due to the late age of marriage. In conjunction with this stage, the theoretical literature and articles were reviewed to learn about the suffering of spinster girls and the harm that befalls them because of this problem. Accordingly, 38 items were collected to measure spinsterhood anxiety. These items were later presented to a group of arbitrators and were shortened to 31 items.

As part of the content validity stage, representativeness and uniqueness were verified, and two items were deleted; thus, the number of items in the scale was 29. In the second stage, EFA was conducted on a separate sample, and the results revealed that there were 5 factors for constructing the SAS with 26 items. These factors were confirmed in a separate sample through

CFA procedures, using two models—the single-factor model and the multifactor model—to compare and verify the presence of the five factors.

The results of the CFA confirmed the validity of the scale model with five factors. Accordingly, it is possible to correct the scale according to the total score so that the scale scores, all of which are negative, range from 0 to 104, with a higher number indicating a higher degree of ASA. This scale also has flexibility, as it can be corrected according to its five different factors. Notably, regarding the study sample members' response to the question, "If a suitor with good specifications and capabilities proposes to you, would you agree to marry him if he was married to another woman?", the most common answer was yes, which constituted 48.52%, while 43.83% of the girls answered no.

Those who answered "not sure" had the lowest percentage, at 7.56%. This indicates several interpretations, namely that the spinster girl gives up certain conditions and accepts marriage as a second or third wife, because the anxiety of spinsterhood is largely linked to negative social stigma as well as family, financial, physical, and sexual problems. She accepts a reality in which she may forgo some benefits of being a first wife in exchange for forming a family, getting married, becoming a mother, and having children in the future. This idea may constitute an obstacle for many girls and societies, due to the negative social outlook, financial circumstances affecting the family, and the husband's inability to have multiple wives.

There are major conflicts that the spinster Arab woman experiences. On the one hand, she has anxiety in the future about remaining a spinster or marrying and becoming a second wife, knowing that the financial circumstances also do not allow the husband to have multiple wives and that many family, economic, and social consequences prevent this from happening (Aldahadha, 2025).

As for the second question related to past lost marriage opportunities that the respondent did not accept, the largest percentage of respondents answered yes (48.02%), indicating that real marriage opportunities existed. This may be contrary to some of the teachings of the Islamic religion, as the Prophet said: "*If someone comes to you whose religion and character you are satisfied with, then marry him.*" However, girls may gamble in the hope that a groom with better specifications will come, and in return, they become older and begin to lose opportunities.

These items achieved a reliable loading rate of more than 0.4. There is no doubt that marriage is linked to having children, and Arab customs, traditions, and Islamic teachings have long imposed on most families the expectation that children always take care of their parents. It is a great shame for parents to live in nursing homes in their old age, as this contradicts cultural and social traditions and is forbidden in the Islamic religion. Caring for parents is both a right and a duty for children, which constitutes a concern and anxiety for girls about remaining unmarried and becoming spinsters.

The items of this scale have achieved reliable loading, as is the case for all items of the scale in all five factors. The results of the second sample, which aimed to verify the validity of the CFA, confirmed that this model is fundamentally appropriate for answering within its five factors. It can be corrected based on the total score, i.e., the sum of the five factor scores, which range from 0 to 104, or it can be answered within each factor alone. On the other hand, the results revealed a statistically significant relationship between each of the BDI-ArV, BAI-ArV, WB, and ArS-MH scales and the total score of the SAS.

Regarding the reliability of the scale, the results of the test-retest coefficient and split-half reliability, as well as McDonald's omega and Person's test coefficient, showed that this scale was stable and consistent over a fixed period of time, which confirms again the reliability of this scale and the possibility of using it as a diagnostic and therapeutic tool with good psychometric properties alongside other related scales (Abdel-Khalek, 2011; Al-Issa et al., 2000; Beck et al., 1996; Tennant et al., 2007).

Finally, to verify the predictive ability of the SAS for BDI-ArV, BAI-ArV, WB, and ArS-MH while neutralizing the effects of both age and income, the results of the predictive ability were increasingly interpreted as we entered the dependent variables in each step. In the first step, when the depression variable was entered, the prediction rate was 6%. When the anxiety variable was added, the prediction ability increased to 31%, indicating that anxiety had a more prominent role in prediction compared to depression. This can be explained by the similarity between BAI-ArV and SAS. When the WB variable was added, the rate increased to 52%.

In the last step, when the ArS-MH variable was added, the prediction ability increased to 79%. This means that the SAS predicts ArS-MH more than the other variables do, as the prediction rate was 27%, followed by anxiety, with a prediction rate of 25%, and finally WB, with a prediction rate of 21%. This clearly indicates the strong relationship between the SAS and mental health, which confirms again that the anxiety of spinsterhood, with its religious, cultural, and social aspects, is significantly related to mental health factors and that reducing this anxiety can contribute to overall well-being and improved mental health.

The interpretation of the results of this study takes into account several limitations, the most important being the difficulty of obtaining a study sample of single girls. Since the study tools were sent to account holders with many followers, to control this limitation, the tools were distributed across different accounts. However, this limitation was managed by deriving scientific items that do not violate public decency.

CONCLUSION

This is the first study in the world to develop an SAS, which could be a diagnostic and therapeutic tool and a starting point for further research in the Arab environment. Therefore, an appendix containing the Arabic version of the scale has been added (see Appendix 1). It has very significant practical aspects in the field of family and marriage counseling, especially if we consider that the rate of spinsterhood is very high in Arab countries and almost constitutes one of the most important dilemmas involving social, religious, and health factors, becoming a burden both on the family and on the girl herself.

ACKNOWLEDGEMENT

The research leading to these results has received funding from Mutah University (grant number 2025/1019).

AUTHOR CONTRIBUTION STATEMENT

The authors contributed equally to the completion of this research.

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Islamic Guidance and Counseling Journal

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