Original article

Psychometric properties of childbearing orientations scale

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Abstract

Background and Purpose: Childbirth is a normal physiological process and a family event. Women in various societies with different cultural backgrounds have diverse reasons for childbearing. Understanding the reasons behind childbearing might help overcome some issues associated with early/late reproduction, or lack of desire to give birth. This study was an attempt to develop, validate, and standardize a scale for measuring the childbearing orientations.

Methods: To this purpose, 30 items related to the childbearing orientations were collected based on the related theories and literature. The reliability of the developed scale was confirmed, showing Cronbach's alpha reliability index of 0.95. In addition, the validity was approved by three correlated components. The content and face validities of the scale were confirmed for all the 30 items using the opinions of five experts in the fields of psychology, nursing, and midwifery. The developed questionnaire was distributed among 215 participants to be filled out. The participants were selected out of the students studying five different majors, including human sciences (n=123), engineering (n=48), medical sciences (n=18), agriculture (n=8), and basic sciences (n=18) using the quota sampling technique. The participants were categorized based on their age, educational level, and marital status.

Results: Based on results of the factor analysis, four items with loading below 0.5 were discarded and the rest 26 items formed three components, including intrinsic motivation (14 items), developmental motivation (7 items), and extrinsic motivation (5 items). The developed instrument proved to be both valid and reliable (r=0.95).

Conclusion: Researchers in the fields of nursery, midwifery, and psychology may find the developed instrument and the related discussion useful.

Keywords: Childbearing orientations, Properties, Psychometric

Introduction

Human begins have a long history. Generations have passed giving birth to new generations. People have been busy with their lives, work, and pleasure throughout the history. One common issue within all cultures can be the tendency to have children or lack of desire to parent. As de Vries (2004) stated, childbirth is a normal physiological process and a family event (1).

Sluijs also added that women's preferences and choices for having children are affected by their family members such as their mother and sisters (2). Therefore, family, cultural background, and geographical region play a significant role in the women's childbearing orientations (2). For those who desire to have children, time is an important factor since the female fertility declines with advancing age. The female reproductive phase is relatively short in comparison to their entire lifespan (3). Yet, many women postpone having children due to several reasons, such as keeping their job or

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continuing their studies.

On the other hand, for the ones who do not tend to have children, the case is not the same. Childlessness is an increasingly common condition in many countries, especially in the European societies (4). Although demographic context and nature has changed, childlessness is not a new phenomenon (5). According to Hagestad and Call (6), childlessness is related to being infertile or single. It often results from various external obstacles or associated with a shift in people's attitudes and life priorities.

While many studies have been carried out to investigate the problems preventing the young couples from having children (3, 7-9), few studies have examined the childbearing orientations. For instance, Wijma, Wijma, and Zar (10) developed the Delivery Expectancy/Experience Questionnaire, which is a commonly used measurement tool for the fear of childbirth.

Moreover, Dencker, Taft, Bergqvist, Lilja, and Berg (11) worked on the Childbirth Experience Questionnaire. This instrument measures the important dimensions of the first delivery experience and may be used to measure different aspects of maternal satisfaction with labor and birth. In another study, Carlsson, Ziegert, and Nissen (12) developed the Childbirth Self-Efficacy Inventory, which can be used as a tool to identify those women who need extra support and evaluate the efforts of improving women's self-efficacy during pregnancy.

Considering the instructions of the health organization and following the orders of the supreme leader of Iran in removing the barriers from having children, and also motivating the target group to have more children, a special need was felt to develop a scale that could identify the tendency of women to have children. Despite several decades of empirical and theoretical emphasis on the importance of reproduction, we do not have an appropriate scale for investigating the childbearing orientations.

With this background in mind, the present study was performed to fill the existing gap in the related studies. The developed scale is expected to be used in the paramedical, psychological, and sociological studies investigating the childbearing orientations. To the extent of the researchers' knowledge, there has been no formal study designing a scale investigating the childbearing orientation.

A valid scale to identify, define, and evaluate the components of childbearing orientations can indeed provide the means to address different research questions regarding the childbearing tendency, which has been mostly untapped so far. Therefore, considering the importance of a valid and reliable instrument investigating the childbearing orientations, the present study was an attempt to standardize the mentioned instrument through recruiting a group of female students.

Materials and Methods

Study population

The participants were chosen out of five different majors, including human sciences (n=123), engineering (n=48), medical sciences (n=18), agriculture (n=8), and basic sciences (n=18) through the quota sampling technique. They were categorized based on their age, educational level, and marital status.

Out of 215 participants, 66, 77, 56, 14 samples were within the age group of 15-19, 20-24, 25-29, and 30-34, respectively. Accordingly, only 1% of the total samples were within the age ranges of 35-39 and above 40. Furthermore, 66, 33, 87, and 26 participants had under-diploma, associate, bachelor's, and master's degrees, respectively. However, only three cases had PhD degree that comprised 1.4% of the total samples. Regarding the marital status, 202 (94%) and 13 (6%) participants were single and married, respectively.

Research instruments

In general, 30 items related to childbearing orientations were developed based on the theories and available literature. Specific attention was paid to developing the items, which showed the females' orientations towards having children. The suggestions made by Dornyei (2003) were also taken into consideration in the item collection process. Out of the 30 items, four cases with loading below 0.5 were discarded. The data were analyzed

using the SPSS version 21.

Research process

The present analogical study was an attempt to develop a childbearing orientation scale for mothers. To this aim, the sample sentences were employed from different sources (e.g., 10-12). In addition, some items were added by the researchers based on the theories related to the childbearing orientations. The content and face validities of the scale were confirmed for all the 30 items using the opinions of five experts in the fields of psychology, nursing, and midwifery.

The reliability of the scale with its original 30 items turned out to be 0.95, which was indicative of a high reliability index. The quota sampling technique was employed to select the students (13) of the Islamic Azad University of Sari, Mazandaran, Iran, studying in the fields of human sciences, engineering, medical sciences, agriculture, and basic sciences. Subsequently, the researcher informed the participants of the study objectives.

Since it was not possible to distribute the questionnaire among all the participants at the same time, the researchers handed out the questionnaires to the students of each major on a specific day (i.e., five days altogether). The participants were given 15 min to fill out the 30-item childbearing questionnaire. The results of the Cronbach's Alpha reliability analysis and construct validity of the scale are presented in the following section.

Results

In order to develop the childbearing questionnaire, 30 items that seemed to be related to the topic were developed based on the theories in the literature and opinions of some experts in the fields of psychology, nursing, and midwifery. An exploratory factor analysis through the varimax rotation was run to probe the construct validity of this questionnaire. Before discussing the results, it should be mentioned that the present sample size was enough for running factor analysis (Kaiser-Meyer-Olkin [KMO]=0 .937). The KMO measure indicates whether there are any linear relationships between the variables and whether it is appropriate to run the exploratory factor analysis on the current data set. Herein, the KMO measure was 0.937, which is "marvelous" according to Kaiser's (1974) (14) classification of measure values.

The Bartlett's test of sphericity examines the null hypothesis, i.e., whether the correlation matrix is an identity matrix. Effectively, it is saying that there are no correlations between any of the variables. In this case, it can be noted that the Bartlett's test of sphericity was statistically significant (x^2 [435]=4885.17; $P<0.05$). Table 1 shows the factors with the eigenvalues of 1 and above.

The eigenvalue-one criterion was applied to extract the components of the questionnaire. As Table 3 displays, there were three factors that accounted for 63.16 % of the total variance based on eigenvalues of 1 and above. Table 2 demonstrates the rotated component matrix that clusters the items.

The components were named intrinsic motivation, developmental motivation, and extrinsic motivation, respectively. Although items with loadings above 0.4 indicate a good level of cut-point (Brown, 2009), loadings below 0.5 were discarded. It should be mentioned that since items with loadings above 0.5 were taken into consideration, 4 items, namely items 15, 24, 29, and 30, were discarded. The final extracted items are exhibited in the following table.

As noted in Table 2, items 1-14, 16-22, and 23-28 (except for item 4 that was discarded) constituted the intrinsic motivation, developmental motivation, and extrinsic motivation factors, respectively. Appendix A illustrates the final extracted items for each factor. The next table presents the reliability analysis of the childbearing questionnaire with 30 items before omitting the items with loading below 0.5 (i.e., items 15, 24, 29, and 30).

The Cronbach's alpha reliability was calculated for the childbearing questionnaire. The result of the reliability analysis revealed a high reliability index for the questionnaire (r=0.95). In addition, the result of the Guttman split-half coefficient demonstrated the reliability index of 0.7, which was indicative of a high reliability based on the triple division rule (Hamidi, 2015). Since four items were removed from the questionnaire due to showing a cut-off

Table 1. Initial eigenvalues extracted to explain the total variance

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative (%)	Total	% of variance	Cumulative (%)	Total	% of variance	Cumulative (%)
1	12.797	42.658	42.658	12.797	42.658	42.658	9.749	32.498	32.49
2	4.328	14.426	57.085	4.328	14.426	57.085	4.997	16.657	49.15
3	1.824	6.081	63.166	1.824	6.081	63.166	4.203	14.011	63.16
4	0.967	3.224	66.390						
5	0.826	2.753	69.143						
6	0.783	2.609	71.751						
7	0.740	2.465	74.216						
8	0.679	2.265	76.481						
9	0.613	2.042	78.523						
10	0.598	1.995	80.518						
11	0.515	1.717	82.235						
12	0.488	1.628	83.863						
13	0.457	1.522	85.385						
14	0.424	1.413	86.797						
15	0.399	1.329	88.126						
16	0.386	1.287	89.413						
17	0.357	1.189	90.602						
18	0.328	1.093	91.696						
19	0.308	1.025	92.721						
20	0.289	0.965	93.686						
21	0.260	0.866	94.552						
22	0.249	0.830	95.381						
23	0.236	0.787	96.168						
24	0.213	0.710	96.878						
25	0.207	0.689	97.567						
26	0.185	0.615	98.182						
27	0.163	0.542	98.725						
28	0.147	0.490	99.215						
29	0.140	0.466	99.680						
30	0.096	0.320	100.000						

point of 0.5, the reliability analysis was calculated once again for the remaining 26 items. Table 4 illustrates the respective results.

The Cronbach's alpha reliability was recalculated for the childbearing questionnaire with the remaining 26 items. The result of the reliability

Table 2. The final extracted items through varimax rotation developed for the childbearing scale

Factors	Loaded items for each factor
Intrinsic motivation	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
Developmental motivation	16, 17, 18, 19, 20, 21, 22
Extrinsic motivation	23, 25, 26, 27, 28

Table 3. The reliability analysis of the 30-item childbearing questionnaire

Cronbach's alpha	Part 1	Value	0.955
		Number of items	15[a]
	Part 2	Value	0.902
		Number of items	15[b]
	Total number of items		30
Correlation between forms			0.541
Spearman-Brown coefficient		Equal length	0.702
		Unequal length	0.702
Guttman split-half coefficient			0.699

Appendix A. The final version of the extracted and removed items for the childbearing questionnaire

Factors	Items
Intrinsic motivation	1. I like to have babies 2. I'd love to have babies 3. I enjoy taking care of the child 4. I enjoy hugging babies 5. I inherently like having babies 6. The presence of a baby is so precious to me 7. I inherently like to rear and bring up babies 8. I take pride in having babies 9. I enjoy breast-feeding the babies 10. I have a strong feeling towards having babies 11. I like babies with all its difficulty 12. I enjoy getting pregnant 13. I love having babies 14. I am so much dependent on bearing a child
Developmental motivation	16. Children are of great help to their parents when parents are old 17. Children help me evolve 18. I can come to my unreached wishes by having babies 19. Children help me out of my loneliness 20. Children help me fill my leisure time 21. Children help my husband and I have better relationship 22. I think I will have done my legal duties by having children
Extrinsic motivation	23 I have children so that they inherit my properties 25. I have children due to the insistence of my family 26. I have children due to competing with my friends 27. I have children due to receiving gifts 28. I have children so that I prove it to everyone I can bear children
Removed	15. I like to have many children 24. I have children so that my husband becomes more devoted to his life 29. I have children due to the social and cultural requirements 30. I have the feeling of immortality by bearing a child

analysis indicated that the questionnaire enjoyed high reliability index (r=0.95). Furthermore, the results of the Guttman split-half coefficient revealed that the questionnaire had the reliability index of 0.71, indicating a high reliability according to the triple division rule (15). Therefore, the questionnaire was confirmed to be quite reliable with the remaining items. Appendix B exhibits the item total statistics for the finalized childbearing questionnaire.

In order to analyze the construct validity of the childbearing questionnaire and inter-factor reliability, the three components of intrinsic, developmental, and extrinsic motivation were correlated with each other (Table 4). The mean scores for intrinsic, developmental, and extrinsic motivations were 4.02±0.80, 3.77±0.83, and 2.13±0.88, respectively. Table 4 presents the results

Table 4. Reliability analysis of the 26-item childbearing questionnaire

Cronbach's alpha	Part 1	Value	0.956
		Number of items	13[a]
	Part 2	Value	0.888
		Number of items	13[b]
	Total number of items		26
Correlation between forms			0.565
Spearman-Brown coefficient		Equal length	0.722
		Unequal length	0.722
Guttman split-half coefficient			0.717

Appendix B. The item total statistics for the finalized childbearing questionnaire

	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Squared multiple correlation	Cronbach's alpha if item deleted
q1	89.40	277.278	0.615	0.640	0.941
q2	89.48	276.802	0.598	0.601	0.942
q3	89.41	275.318	0.665	0.649	0.941
q4	89.18	280.062	0.606	0.674	0.942
q5	89.41	274.683	0.680	0.705	0.941
q6	89.20	276.556	0.706	0.780	0.941
q7	89.36	273.212	0.731	0.713	0.940
q8	89.43	273.275	0.750	0.693	0.940
q9	89.57	269.405	0.748	0.771	0.940
q10	89.48	268.849	0.797	0.836	0.939
q11	89.60	271.792	0.786	0.801	0.939
q12	89.40	274.699	0.741	0.669	0.940
q13	89.84	271.361	0.701	0.619	0.940
q14	89.61	271.612	0.765	0.731	0.940
q16	89.63	276.179	0.582	0.540	0.942
q17	89.52	277.139	0.655	0.606	0.941
q18	90.20	272.650	0.625	0.620	0.941
q19	89.73	276.974	0.557	0.746	0.942
q20	89.73	274.123	0.634	0.747	0.941
q21	89.38	274.013	0.698	0.602	0.940
q22	89.75	272.215	0.650	0.544	0.941
q23	90.94	278.207	0.476	0.547	0.943
q25	91.32	286.965	0.283	0.606	0.945
q26	91.54	289.343	0.222	0.654	0.946
q27	91.70	288.315	0.278	0.625	0.945
q28	91.27	280.822	0.393	0.610	0.945

of the Spearman's rank-order correlation for the three components of the childbearing questionnaire.

According to Table 5, the intrinsic motivation had a significant positive correlation with the developmental and (r=0.64, *P<0.01*) and extrinsic motivations (r_s=0.14, *P<0.05*). Furthermore, there was a significant positive correlation between the developmental and extrinsic motivations (r=0 .37,

Table 5. Spearman's rank-order correlation between the three components of the childbearing questionnaire

		Intrinsic	Developmental	Extrinsic
Intrinsic motivation	Correlation coefficient	1	0.640**	0.146*
	Sig. (2-tailed)		0.000	0.032
Developmental motivation	Correlation coefficient	0.640**	1	0.376**
	Sig. (2-tailed)	0.000		0.000
Extrinsic motivation	Correlation coefficient	0.146*	0.376**	1
	Sig. (2-tailed)	0.032	0.000	

P<0.01).

Discussion and Conclusion

This study was carried out to develop, validate, and standardize a scale investigating the childbearing orientations. The content and face validities of the scale were confirmed for all the 30 items using the opinions of five experts in the fields of psychology, nursing, and midwifery. To this end, the 26-item childbearing orientation questionnaire was finalized by confirming its validity and reliability.

The scale had a high reliability index of 0.95. The results of the construct validity (through exploratory factor analysis) demonstrated that the scale consisted of three components, including intrinsic motivation (14 items), developmental motivation (7 items), and extrinsic motivation (5 items), which were significantly correlated with each other. The intrinsic and extrinsic motivations have been identified and investigated in many studies; however, the developmental motivation seems to be rather untapped.

In this regard, the current study was successful in introducing a new instrument for investigating the childbearing orientations propounding a new type of motivation (i.e., developmental).

Motivation is a personal modifiable factor (16), which varies within individual, from person to person, and based on time. The same is true for the three components found in this scale (i.e., intrinsic, extrinsic, and developmental motivation).

Therefore, we should be careful with the generalizability of the findings of the study. Given the reliability and validity of this instrument, it can be used in Iran. Moreover, the Islamic countries can benefit from this questionnaire due to their cultural similarities with Iran. However, the western cultures may find the scale not that much appropriate since some items root in the eastern Muslim culture. Nonetheless, future studies are recommended to re-assess the criterion validity of this instrument.

The findings of this scale would reflect some of the people's orientations towards having children; therefore, they are helpful for the single and married women in the context of Iran. Additionally, this instrument can be used in the paramedical, psychological, and sociological studies to investigate the childbearing orientations.

As the findings of the present study demonstrated, the mental health scores had significant relationships with age, gender, and field of study. Considering the importance of the mental health issue in the students of medical sciences, the academic stakeholders should pay more attention to this issue among the university students and provide them with psychological support systems and counseling centers. In this study, the authors declare no conflicts of interest.

Conflicts of interest

The authors of the present study declared no conflicts of interest.

Authors' contributions

All authors contributed equally to the writing of the scientific proposal, data collection, and manuscript drafting. The final manuscript was reviewed and approved by all the authors.

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