Reviewing the Development and Adaptation Steps of the Scales Specifically Used for Pregnancy, Childbirth, and Postpartum in Türkiye Between 2010 and 2020

Abstract

Background: Scales are widely used in scientific research. In Türkiye, many scales are used in midwifery. However, there is no standard approach to scale development and adaptation. To clarify this situation, it is extremely important to study the steps of scale development and adaptation.

Aim: The aim of this study is to investigate the steps of scale development and adaptation used in pregnancy, childbirth, and postpartum.

Methods: The study was conducted in a retrospective and descriptive design. The study population consists of scale studies specifically related to pregnancy, childbirth, and postpartum in Türkiye published between 2010 and 2020. The sample consisted of 14 scale development studies and 31 scale adaptation studies retrieved from the ULAKBIM-TR (Turkish Academic Network and Information Centre), Google Academic, and Higher Education Council National Thesis Centre Database (n=45). In examining the studies, content analysis was conducted using the "Scale Development Process Control Form" and the "Scale Adaptation Process Control Form," which were prepared in accordance with the literature. The frequency and percentage distributions of the data were analyzed using the Statistical Package for Social Sciences 26 package program.

Results: The theoretical basis of the measured structure and the purpose of the measurement instrument are stated in all articles. Exploratory factor analysis and confirmatory factor analysis were used together to determine construct validity in 57.1% of the developed scales and 54.8% of the adapted scales. No pilot study was conducted in 29% of the scale adaptation studies and in 21.4% of the developed scales. The Cronbach's alpha coefficient was calculated to estimate the reliability of almost all the scales studied.

Conclusion: The analysis of the data obtained shows that the opinions of the measurement and evaluation experts were not taken into account and the pilot study application was not used in the studies examined. To avoid errors in this area and to perform the process correctly, it is recommended to develop guidelines and create up-to-date resources and algorithms.

Keywords: Birth, midwifery, postpartum, pregnancy, reliability, scale, validity

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Introduction

Pregnancy, childbirth, and postpartum are processes that bring about important changes in a woman's life. These developmental processes bring about many changes in the daily routine of the woman herself and her family.[1-3] It is important for midwives to recognize the specific needs of women and those around them during these developmental periods and to plan appropriate care for their needs to avoid period-specific problems. In these processes, it is important to measure the attitudes of the women and those around them due to this change to identify potential problems. For this reason, it is necessary to develop measurement instruments that are specific to this period or to check their validity and reliability. To meet this requirement, it is important for midwives to develop measurement instruments that are appropriate for this period, to check their validity and reliability, to know the measurement instruments, to have access to them, and to know how to use them.

Looking at the literature, one finds that there are several scales that have been developed and adapted to assess pregnancy, childbirth, and the postpartum period in the

field of midwifery in Türkiye. Most of these scales have been adapted to Turkish culture[4-6] and some have been developed by Turkish researchers.[7,8] These scales can be used to measure and assess people's attitudes and behaviors. Considering the periods in which the scales are used (pregnancy, childbirth, and postpartum) and the decisions made about the individuals according to the results obtained with the scales and the studies conducted, it is very important to make general assessments about the field and to show the trends in the field by examining the steps taken in developing or adapting the scales. There are studies in the literature that examine the steps in the development and adaptation of scales used in various fields from education to psychology, and these studies generally provide information about the status of the scales and the problems encountered in the process.[9,10] It was found that scales used in the field of midwifery are treated with different methods,[11,12] but no study was found that examined the processes of development and adaptation.

This study was conducted with the aim of examining the scales used in Türkiye during pregnancy, childbirth, and postpartum in terms of the steps of scale development and adaptation, highlighting the similarities and differences in the steps and guiding the studies on scale development and adaptation in this field.

Methods

Type of the Study

The study was planned and conducted in a retrospective and descriptive design.

Population and Sample of the Study

The research population consisted of the scale studies used in pregnancy, childbirth, and postpartum in Türkiye published between 2010 and 2020. The sample consisted of 14 scale development studies and 31 scale adaptation studies found in the ULAKBIM-TR, Google Academic, and Higher Education Council National Thesis Centre Database (n=45). The keywords "midwifery, pregnancy, childbirth, postpartum, scale development, and scale adaptation" were used to search the databases and the search was conducted in Turkish. Studies that were available in full text and contained the above keywords were included in the study. Table 1 provides information on the publication type and study type of the scales that were examined in the study.

Data Collection

"Scale Development Process Control Form" and "Scale Adaptation Process Control Form" developed by researchers[9,13-15] in line with the literature to examine the same steps and ensure standardization in the collection of scale data were created and used.

Ethical Aspect of Research

As a literature review was conducted to collect the data for the study, there are no direct effects on humans or animals. For this reason, ethics committee approval was not sought.

Analysis of the Data

The content analysis method was used to analyze the research data. In content analysis, the content of oral, written, and other materials is objectively and systematically classified in terms of meaning and/or grammar, converted into numbers, and conclusions are drawn.[16] In the study, content analysis was carried out taking into account the items in the control forms for scale development and scale adaptation. In analyzing the data, frequency and percentage distributions were examined in the program IBM SPSS 26 (IBM Statistical Package for Social Sciences Corp., Armonk, NY, ABD).

For reliability of data, 5 articles randomly selected from 45 studies were examined by 2 researchers. To determine reliability in terms of consistency between researchers, the formula of Miles and Huberman (Reliability=consensus/consensus+disagreement) was used.[17] Using this formula, the consistency between researchers was calculated to be 0.80. The scales to which the data corresponded were analyzed and tested for validity and reliability.

Results

The findings obtained from the research data were processed taking into account the checklists developed. Accordingly, the results regarding the methods for determining the purpose and conceptual framework of the scale, preparing the item pool, obtaining expert opinions, trial application, and determining the validity and reliability of the scale, which are among the basic steps to be taken in the process of scale development and adaptation studies, are given in the tables, respectively.

If we look at the distribution of the scales studied in the study according to the development periods, we find that 42.2% of the scales studied were developed or adapted for the period of pregnancy, 31.1% for childbirth, and 26.7% for the postpartum period. Looking at the years in which the scale studies were most frequently conducted, 22.2% were developed or adapted in 2016, 17.8% in 2018, 11.1% in 2019, and 11.1% in 2017.

All scales studied in the research were found to have stated the purpose of the measurement instrument and defined the theoretical basis of the measured structure. The results regarding the creation of the item pool of the developed and adapted scales are presented in Tables 2 and 3, respectively. In this study that in the creation of the items, expert opinion was taken in 42.9% of the developed scales, in 21.4% expert opinion was taken and the literature review method

Table 1. Information on the Study Type and Publication Type of the Scales									
		Study Type							
		Published in Journal		Master's Thesis		Doctoral Thesis		Total	
		n	%	n	%	n	%	n	%
Publication Type	Development	8	57.1	2	14.3	4	28.6	14	100
	Adaptation	19	61.3	11	35.5	1	3.2	31	100

Table 2. Preparation of the Item Pool of the Developed Scales (n=14)		
Item Writing Process	N	%
Taking expert opinions	6	42.9
Literature review	2	14.3
Taking expert opinions and literature review	3	21.4
Taking expert opinions, literature review, and taking opinions from focus group	3	21.4
Negative items		
There is a negative item	8	57.1
No negative item	6	42.9
Control items		
There is a control item	3	21.4
No control item	11	78.6
Status of taking expert opinion		
Expert opinion taken	14	100
Qualification of experts consulted for their opinions		
Expert in the field	13	92.9
Expert in the field and measurement and evaluation expert	1	7.1

Table 3. Creation of the Item Pool of the Adapted Scales (n=31)		
Item Writing Process	N	%
Taking expert opinion	29	93.6
Literature review	1	3.2
Taking opinions from focus group	1	3.2
Status of obtaining permission to adapt		
Not complied	1	3.2
Partially complied	1	3.2
Complied	17	54.9
Not specified	12	38.7
Negative items		
There is negative item	12	38.7
No negative item	19	61.3
Total	31	100
Control items		
There is control item	11	35.5
No control item	20	64.5
Status of taking expert opinion		
Expert opinion taken	29	93.6
No expert opinion taken	2	6.4
Qualification of experts consulted for their opinions		
Expert in the field	26	83.9
English linguist	1	3.2
Expert in the field and English linguist	2	6.5

was applied, and in 21.4%, expert opinion was taken, the literature review method was applied, and the opinion of the focus group was taken. It was found that 57.1% of the scales contained negative items and 78.6% had no control item. It can be seen that expert opinions were taken for all scales related to the item pool. When considering the quality of experts whose opinions were taken, it was found that opinions of field experts were taken in 92.9% of the studies (Table 2).

Examination of Table 3 reveals that in the creation of the items, expert opinion was taken in 93.6%. It was found that there was no negative item in 61.3% of the scales and no control item in 64.5% of the scales. It was found that expert opinions were taken in 93.6% of the scales related to the item pool. When considering the quality of experts whose opinions were taken, it was found that the opinions of field experts were taken in 83.9% of the studies.

It was found that a pretest was conducted in 78.6% of the scale development studies included in the study and in 71% of the adapted scales.

The application of the scales included the answer category of the scales, the specification of the items of the developed form, and the method of determining the sample size of the trial application. When examining the answer category of the scale development studies examined, the most common first rank of 3 was that 64.3% were 5-point Likert, 14.3% were 4-point Likert, and 14.3% were binary Likert. In the scale adaptation studies, it was found that 35.5% were 4-point Likert, 28.8% were 5-point Likert, and 16.8% were 6-point Likert type. It was found that the items of the developed form were reported in 50% of the developed scale studies, and the final form of the scale was reported in 54.8% of the adapted scales. In determining the

sample size of the trial application of the scale development studies, it was found that the rate of participants per item was 5-10 times in 42.9% and the rate of participants per item was 5-10 times in 35.5% of the adapted scales.

Examination of Table 4 reveals that 57.1% of the studies with the developed scales used exploratory and confirmatory factor analysis (CFA) together, while structure validity was not examined in 7.1%.

When Table 5 was examined, it was found that exploratory and CFA were used together in 54.8% of the adapted scale studies, and structure validity was not examined in 12.9% of the studies.

It was found that in 21.4% of the scale development studies examined, no item analysis was conducted and criterion validity was not examined in all studies. In the studies on scale adaptation, it was found that no item analysis was conducted in 93.5% of the studies and criterion validity was not examined in 71% of the studies.

In estimating reliability in the scale development studies included in the study, it was determined that the Cronbach's alpha coefficient was calculated in 42.9% of the scales, the Cronbach alpha and test–retest reliability in 28.6%, the Cronbach's alpha coefficient in 41.9%

Table 4. Methods Used to Determine the Structure Validity of the Developed Scales (n=14)		
Methods Used to Determine Structure Validity	N	%
EFA	5	35.8
EFA and CFA	8	57.1
Unreviewed	1	7.1
EFA, exploratory factor analysis; CFA, confirmatory factor analysis.		

Table 5. Methods Used to Determine the Structure Validity of the Adapted Scales (n=31)		
Methods Used to Determine Structure Validity	N	%
EFA	5	16.1
CFA	5	16.1
EFA and CFA	17	54.8
Unreviewed	4	12.9
EFA, exploratory factor analysis; CFA, confirmatory factor analysis.		

of the scale adaptation studies, and the Cronbach's alpha and test–retest reliability in 38.7% of the scales.

Discussion

This study examined the developmental and adaptive steps of scales used during pregnancy, childbirth, and postpartum between 2010 and 2020. The scales developed and adapted between the dates reported in the research and the results related to the relevant steps according to the form developed by the researchers were discussed in line with the literature.

Explanation of the purpose of the scale and the structure is measured; the purpose of the measurement instrument is stated in all the scales included in the framework of the research and it can be seen that the theoretical basis of the structure measured is explained in its entirety. Looking at the literature, we can see that there are similar results in the studies examining scales developed or adapted in the field of education.[9,10]

In the studies on scale development[7,8] and the studies on adapted scales[4,6,18,19] included in the scope of the research regarding the item writing process, almost three-quarters of the measurement instruments were consulted by experts of the field, while for some scales, it was found that expert opinion was taken and literature review was made.[20,21] When the prepared scale items were examined to see if they were subjected to expert opinion, it was found that expert opinion was taken in almost all studies. The literature states that expert opinion should be taken not only from experts in the field but also from linguist, measurement, and evaluation experts.[13] However, it was found that in more than half of the scale development[7,8,21-27] and scale adaptation studies[6,18,19,28-36] examined in this study, linguist, measurement, and evaluation experts were not consulted. It can be said that this is an indication that scale development and adaptation studies are not conducted in an interdisciplinary manner.

It was observed that scales developed[23] and adapted[37] to those studied in the research were pre-tested. In studies of scale development

and adaptation, it is advisable to pilot study to a smaller group in terms of item clarity, answer time to the scale, and spelling errors.[38]

Although there are different approaches to determining the sample size in the literature, the correct selection of the sample is also very important.[13,38] In determining the size of the group in which to conduct the trial application from the scales studied in the research, it was ensured that the number of items in the scale was at least 5-10 times the most common.[19,39,40]

Exploratory factor analysis (EFA) and CFA were the most commonly used methods for determining structure validity in the scale development studies examined in the research.[22,41-43] Exploratory factor analysis and CFA[6,18,19,44-49] were also the most commonly used methods in scale adaptation studies, and CFA was only used in a few (16.1%) of the scales.[50] In reviewing the literature on this topic, it is reported that to determine the measured structure in scale development studies, analyses should first begin with EFA and then CFA should be conducted on the data of a new sample to check whether the determined theoretical basis is contained in the data.[51,52] Since the theoretical basis of a scale developed in a different culture has already been explained with the EFA, it is recommended in the literature to proceed directly to the CFA stage, as scale adaptation studies do not need to re-run the EFA.[53]

In the literature on item analysis, it is emphasized that item analysis should be conducted before validity and reliability studies of the measurement instrument are conducted.[53] It was found that item analysis was not conducted in very few scale development studies (21.4%)[8,42,44] and in almost all scale adaptation studies (93.5%)[6,40,41,45,54-59] studied in the research.

In the scale development studies included in the research, the method of calculating the Cronbach alpha coefficient was often used as a method for determining reliability.[5,8,60] In the scale adaptation studies, it is seen that the Cronbach alpha coefficient and test–retest reliability were calculated most frequently.[6,30,39,40,44]

Limitations of the Study

A limitation of the study is that the scales were taken from ULAKBIM-TR, Google Academic, and Higher Education Council National Thesis Centre databases published between certain dates.

Conclusion and Recommendations

The evaluation of the data obtained in the light of the literature shows that different methods were used in scale development and adaptation, that no opinions were taken from measurement experts, that no pilot studies were conducted, and that no item analyses were performed. While taking expert opinions on the items of the measurement instrument in scale development and adaptation studies, it is recommended to take not only the opinion of experts in the field but also that of a Turkish linguist and an expert in measurement and evaluation. In addition, it is recommended that the scale items be applied to a smaller group in terms of item clarity, answer time to the scale, and spelling errors. Similarly, in the literature, it is emphasized that item analysis should be conducted before the validity and reliability analysis of the measurement instruments.[32] It is extremely important that researchers approach these issues in a multidisciplinary manner. Due to the deficiencies of scales developed or adapted in studies that do not follow the correct stages of scale development, this can lead to similar deficiencies or errors in

new studies. For this reason, it is recommended to focus on scale development and adaptation.

It is believed that this study is important to standardize the methods used in future scale studies and to provide guidance to researchers planning to conduct research on the scale. To ensure that the studies that will be conducted to contribute to the field are of high quality, it is recommended that guidance documents are developed and up-to-date resources and algorithms are produced. In addition, it is recommended to take the opinion of measurement and evaluation experts and linguists together with experts from the field when developing and adapting the scale and to provide training by measurement and evaluation experts to researchers working on this topic in order to carry out the process more accurately.

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