



Translation and validation of the Swahili version of the Wijma Delivery Expectancy/Experience Questionnaire version A (W-DEQ-A)

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ABSTRACT

Background: Prenatal fear of childbirth is a common health concern that negatively affects the emotional well-being of women during pregnancy. Wijma Delivery Expectancy/Experience Questionnaire version A (W-DEQ-A) is used extensively to measure fear of childbirth during pregnancy. Nevertheless, previous studies have not evaluated its psychometric characteristics among the Swahili-speaking pregnant women. Therefore, the aim was to translate and test the validity and reliability of the questionnaire into Swahili as the popular language in Kenya.

Methods: In the current descriptive cross-sectional study, the W-DEQ-A, together with the Edinburgh Postnatal Depression Scale (EPDS) and Beck Anxiety Inventory (BAI) were administered to a group of 628 pregnant women to explore the dimensionality of W-DEQ-A using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), respectively.

Results: EFA and CFA of the Swahili version of W-DEQ-A identified five-factor loadings: lack of self-efficacy, fear, negative emotions, negative appraisal, and social isolation. However, this model failed to support the unidimensional structure of the original W-DEQ-A. The Swahili version of the W-DEQ-A correlated well with EPDS and BAI at acceptable levels. The Cronbach alpha values of the subscales ranged from 0.867 to 0.967, an indication of an excellent internal consistency of the instrument.

Conclusion: The current study findings provide support for the Swahili version of the W-DEQ-A to be considered as a valid and reliable measuring tool for the fear of childbirth among Swahili-speaking pregnant women in Kenya, and the entire East and Central African region. Also, due to its multidimensional structure, the original W-DEQ-A should not be used in its original form.

Introduction

Childbirth is a biological process characterized by a series of diverse and extrapolative physiological processes. These processes are unknown to most pregnant women in Kenya especially those that skip regular prenatal care clinics [1–3], a prevalent contributor to prenatal Fear of Childbirth (FOC) [4–6].

From the available literature, FOC is common and severe among pregnant women with known pre-existing health conditions as well as those expecting their first-born child [7–9]. As a result, the most fearful tend to prefer elective cesarean section [10] without medical indication, and this has been reported to be more costly when compared to vaginal delivery and may result in dangerous side effects both to the mother and

child such as breathing difficulties and surgical injury to the baby as well as infections, postpartum haemorrhages, reaction to anaesthesia, blood clots, surgical injury, and a higher risk to the mother during future pregnancies [11]. Additionally, studies have indicated a higher prevalence of FOC in women with pre-existing psychiatric disorders [12,13]. Globally, the prevalence of FOC has been reported to be between 3.7 and 43%, with an average prevalence estimated at 14% (95% CI 0.12–0.16) by the random effect model [14]. Another study in six European countries in 2014 indicated that 11% of all women reported severe FOC and first-time mothers presenting a slightly higher FOC at 11.4% [15]. In Africa, studies have indicated a prevalence of 24.5% in Ethiopia, 20% in Malawi, and 22.1% in Kenya [4,5,16].

In the last three decades, the burden of FOC has been associated with

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adverse peripartum and postpartum maternal complications such as unprecedented complications during pregnancy, unexpectedly longer duration of labour, increased pain during labour and childbirth, emergency caesarean section, and post-traumatic stress disorder [17]. Similarly, research has shown that those expectant women with high FOC experience emotional distress and sometimes even after childbirth, which may lead to a phobia for future pregnancies [18].

It is evident that indeed FOC is a serious maternal health issue with varying severity particularly among first-time mothers and it needs a reliable and accurate instrument for screening pregnant women during antenatal care clinics as screening may detect pregnant women with pre-existing mental health problems that are exacerbated by fear of birth [19]. Due to the explained burden of FOC among pregnant women, it is essential to undertake early screening and detection of FOC among pregnant women, to offer prenatal counselling services as this has been documented as one of the effective mitigation measures in minimizing the number of pregnant women suffering from severe FOC [1,20]

Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ) which was developed in 1998 by Klaas Wijma [2] is one of the most common tools used for screening and assessing the severity of FOC among pregnant women. The questionnaire which is in two versions is used during antenatal screening (W-DEQ version A) and the postnatal period (W-DEQ version B). This instrument is a self-reporting scale with 33 items that were designed to measure FOC in terms of the pregnant women's cognitive appraisal of childbirth. The questionnaire has been translated, validated, and used in several countries such as Sweden [2], Italy [21], Japan [22], Norway [23], Australia [18], Hungary [9], and Malawi [24]. Although the questionnaire was conceptualized as a uni-dimensional instrument, the above-listed studies have confirmed a multidimensional structure through Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). All the above-listed studies have tested the dimensionality of the W-DEQ-A scale and found to have diverse factor loadings varied between three factors in a recently published study in Malawi [24], four-factor loadings in UK, Japan, Australia, and Hungary [9,22,25,26], and six-factor loadings in a Norwegian study [23]. All these studies have given different domains of FOC ranging from fear itself, lack of positive anticipation, concern for the child, social isolation, negative appraisal, negative emotions, isolation, the moment of birth, and lack of self-efficacy. In all these studies, the suitability of a mono-factorial solution has been tested and found to have very poor fit statistics with a Comparative Fit Index (CFI) value below 0.6, which is far below the recommended acceptable index of at least 0.85 for an acceptable fit model [27]. This finding proposes that it is incorrect to assume that the W-DEQ-A can be used to measure a single dimension. The assumptions made in such cases might be misleading both to the researchers and practising clinicians as this may lead to loss of critical information regarding the specific needs of pregnant women [26].

To the best of our knowledge, the W-DEQ-A has not been translated and validated in Kenya, and this necessitated this study, given that Kenya and East Africa in general might have unique socio-cultural facets different from those in countries that have translated and validated the questionnaire; for example, unlike the developed countries, in Kenya, 40% of all births occur take place at home and are facilitated by family members or a traditional birth attendant [28]. The majority of the population in Kenya speaks the Swahili language and, therefore, translation and validation of the instrument were essential.

The overall objective of the current study is to determine the psychometric features of the Swahili version of the W-DEQ-A in a sample of healthy pregnant women in Kenya. Specifically, the study aims to: (i) assess the construct validity of the Swahili version of the W-DEQ-A through EFA and CFA, (ii) assess if the pregnant women sample in Kenya fits in the mono-factorial model proposed by the developer of the original 33 items W-DEQ-A, scale, and (iii) to evaluate the reliability and concurrent/convergent validity of the Swahili version of the W-DEQ-A.

Methods

Recruitment of study participants

This descriptive cross-sectional study was part of an interventional study that was being conducted to measure the impact of integrated prenatal education on FOC among women of reproductive age in Kenya. Pregnant women who were attending prenatal care clinics in a county referral hospital were assessed for their suitability to take part in this study. The county referral hospital was chosen as it was the main health facility offering comprehensive emergency obstetric care services in the region and, therefore, it attracted clients from both urban, peri-urban, and rural populations.

Sampling procedure and sample size calculation

A convenience sampling methodology was employed in recruiting study participants who were in their third trimester. The study included both nulliparous and multiparous women with single pregnancy aged between 18 and 45 years, who were able to read and write in the Swahili language. Expectant women who had previous negative childbirth experience and those highly vulnerable to obstetric complications were excluded from the study. Also, the study excluded women who were unable to read and write in the Swahili language. Expectant women who met the inclusion criteria and were voluntarily willing to take part in the study were recruited after signing an informed consent form.

Recruitment of the study participants took place between May and September 2019. A total of 628 pregnant women participated in the current study. This sample size was derived from published articles, which suggests that a minimum of three hundred study participants are needed to successfully run Exploratory and Confirmatory Factor Analysis [29,30], or a ratio of ten participants per item for factor analysis [31]. The authors were cognizant of sensitivity in the two analyses regarding missing data and therefore a larger sample was determined. Most of the collected data was used for EFA ($n = 376$), while the remaining was used to run CFA ($n = 252$). This sample was reached after excluding questionnaires that had missing data.

Procedure

In this study, the W-DEQ-A was used. Permission to translate and use the questionnaire was sought and granted by professor Wijma. The second step was to translate the English version of the questionnaire to the Swahili language, which is a common language used by the study participants. A professor of linguistics was tasked to translate the questionnaire to Swahili, followed by a review of the translations for consistency and conformity. The initial wordings were done by an independent reviewer who was an expert in the two languages. Later, two independent bilingual translators were tasked to back translate to English. In cases where there were differences in opinion regarding the transcripts, a third independent bilingual translator was called to arbitrate. The final step was the harmonization of the questionnaire after undertaking a pre-test with 13 expectant women.

Study measures used in the study

Demographic data included age, level of education, marital status, employment status, residency, and parity were collected through a structured questionnaire. The other instruments used for data collection include:

W-DEQ-A is a 33-item questionnaire developed in Sweden [2] and has been used widely to measure FOC during and after pregnancy by evaluating women's feelings about their experience during pregnancy (W-DEQ-A) and after childbirth (W-DEQ-B). In the analysis, all the 33 items are assessed on a six-point Likert scale ranging from 0 (not at all) to 5 (extremely). The lowest possible score is zero and the highest

possible score is 165. A higher score during the assessment is an indication of high fear of childbirth. A Cronbach alpha score of 0.89 for primiparous and 0.99 for multiparous women indicated good reliability of the questionnaire. Respondents are asked to imagine how their labour and delivery are going to be and how they expect to feel. In the W-DEQ-A, items 2, 3, 6, 7, 8, 11, 12, 15, 19, 20, 24, 25, 27 and 31 are positively framed and must be reversed to get the individual sum.

The second tool used in this study was the Edinburgh Postnatal Depression Scale (EPDS) [32]. This scale comprises 10 items that are self-rating for postnatal depression. A respondent is asked to check off one of the four possible answers that closely resonates with how she felt during the past week. The responses are scored from 0 to 3 based on the reported seriousness of the symptoms. Three items in the scale namely item 3, 5 and 10 are reverse-scored (from 3 to 0). The total individual score is derived from adding the scores of each of the 10 items. A total score of 0 to 6 infers none/minimal depression, 7 to 13 is an indication of mild depression, 14 to 19 is an indication of moderate depression and a score of 20 to 30 indicates severe depression. EPDS has been validated for use in expectant women and postnatal mothers. The current study used the Swahili version of EPDS since the tool has been translated into the Swahili language in Kenya. Our study reported a Cronbach's alpha ranging from 0.89 to 0.91

The third tool used in the current study was the Beck Anxiety Inventory (BAI) [33], which is a self-reporting inventory that is used to measure severe anxiety. The questionnaire has 21 items and respondents have multiple choice answers to respond to the level which they have been bothered by each of the 21 symptoms in the week preceding the interview. The highest possible score is 63 while the lowest possible score is 0. A cumulative score of between 0 and 7 is interpreted as a minimal level of anxiety; 8–15 as mild anxiety; 16–25 as moderate anxiety, while 26–63 as severe anxiety. This tool is psychometrically valid with internal consistency (Cronbach's alpha ranges from 0.92 to 0.94).

In the current study, the English version of the BAI was translated into the Swahili language which is a common language used by the study participants. A professor of linguistics was tasked to translate the questionnaire to Swahili, followed by a review of the translations for consistency and conformity. The initial wordings were completed by an independent reviewer who was an expert in the two languages. Later, two independent bilingual translators were tasked to back translate to English. In cases where there were differences in judgement regarding the transcripts, a third independent bilingual translator was asked to arbitrate. The final step was the harmonization of the questionnaire after undertaking a pre-test with 13 pregnant women.

Data analysis

Construct validity of W-DEQ-A was assessed using EFA and CFA and this was done in two steps. In the first step, the Statistical Package for Social Sciences version 23 (SPSS Chicago, IL, USA) was used. The Kaiser-Meyer-Olkin (KMO) was used to confirm the suitability of the data used for EFA and the values above 0.6 were deemed acceptable [34] as well as significant Bartlett's test of sphericity [35]. For extraction of factors, principal components analysis was used and Promax with Kaiser Normalization as a rotation method. To identify the accurate number of factors to be retained, the following criteria were employed: (i) Kaiser's criterion [29] (ii), retention of eigenvalues above 1 [36] (iii), Cattell's scree plot, [37] and (iv) parallel analysis [38].

The second step was to undertake confirmatory factor analysis, done by running the data through AMOS 25 software [39] to determine the unidimensional fit of the original W-DEQ-A scale and to validate the factor structure solution derived from step one above. The overall model fit was assessed by various fit statistics in AMOS 25. Considering that Chi-square statistics and the associated *p*-value is very sensitive to sample size, the Chi-square test divided by its degrees of freedom was considered in the current study. Further, two incremental fit statistics

namely; comparative fit index (CFI > 0.95 good fit) and goodness of fit index (GFI > 0.95 good fit) were reported. Also, the root-mean-square error of approximation (RMSEA < 0.08 good fit) [40], Tucker-Lewis index (TLI > 0.95 good fit) [27], Akaike information criterion (AIC- the smaller the better), and the standardized root mean square residual (SRMR < 0.08 acceptable) [39] were considered. A minimum of three of the fit statistics within acceptable ranges was adequate in analyzing the goodness of fit of the current study data. Internal consistency and reliability were assessed using Cronbach's alpha coefficient and a level of ≥ 0.70 was considered acceptable.

Convergent and divergent validity was assessed by Spearman's rank correlation coefficient. This was done to determine the level of correlation between the W-DEQ-A scale (and its factors) and other scales used in the current study (BAI and EPDS) and a *p*-value of < 0.05 was set as statistically significant.

Results

A total of 628 pregnant women took part in the current study with 376 for EFA and 252 for CFA. The mean age for the EFA and CFA was 27 (SD = 5.43) years. For the participants in EFA, approximately 37.8% (n = 142) were between 25 and 29 years. About 31.6% (n = 119) had college education, 76.6% (n = 288) were married and 75.5% (n = 284) were not employed. In terms of parity, 57.7% (n = 217) of the participants in EFA were primiparous. For the participants in CFA, 40.9% (n = 103) were between 25 and 29 years, with 48.4 (n = 122) having secondary education and 80.6% (n = 203) being married. In terms of employment, 85.3% (n = 215) were not employed and in terms of parity, 69.8% (n = 176) were multiparous (Table 1).

Table 1
Participant characteristics.

	Socio-demographic characteristics	Total sample n (%)	EFA sample n (%)	CFA sample n (%)
1	AGE (MEAN, SD)	27 (5.4)	27 (5.4)	27(5.4)
	18–24	191 (30.4)	122 (32.4)	69 (27.4)
	25–29	245 (39.0)	142 (37.8)	103 (40.9)
	30–34	145 (23.0)	85 (22.6)	60 (23.8)
	35–45	47 (0.7)	27 (7.2)	20 (7.9)
		628 (100.0)	376 (100.0)	252 (100.0)
2	EDUCATION			
	Primary	69 (10.9)	58 (15.4)	11 (4.4)
	Secondary	240 (38.2)	118 (31.4)	122 (48.4)
	College	217 (34.6)	119 (31.6)	98 (38.9)
	University	101 (16.8)	81 (21.5)	20 (7.9)
		628 (100.0)	376 (100.0)	252 (100.0)
3	MARITAL STATUS			
	Single	133 (21.2)	85 (22.6)	48 (19.0)
	Married	491 (78.2)	288 (76.6)	203 (80.6)
	Divorced	4 (0.0)	3 (0.8)	1 (0.4)
		628 (100.0)	376 (100.0)	252 (100.0)
4	RESIDENCE			
	Rural	379 (60.3)	212 (56.4)	167 (66.3)
	Peri-urban	161 (25.6)	104 (27.7)	57 (22.6)
	Urban	88 (14.0)	60 (16.0)	28 (11.1)
		628 (100.0)	376 (100.0)	252 (100.0)
5	EMPLOYMENT STATUS			
	Employed	129 (20.5)	92 (24.3)	37 (14.7)
	Not employed	499 (79.4)	284 (75.5)	215 (85.3)
		628 (100.0)	376 (100.0)	252 (100.0)
6	PARITY (MEAN \pm SD)			
	Primiparous	393 (62.5)	217 (57.7)	176 (69.8)
	Multiparous	235 (37.4)	159 (42.3)	76 (30.2)
		628 (100.0)	376 (100.0)	252 (100.0)

Exploratory factor analysis (EFA)

The suitability for EFA was confirmed with a KMO measure of sampling adequacy of 0.883 and a significant Bartlett’s Test of Sphericity ($\chi^2 = 11676.602; p = <0.001$). As indicated in Table 2, EFA was performed through principal component analysis on the initial W-DEQ-A’s 33 items. A 24 item, 5-factor solution with eigenvalues greater than 1 were identified. These factors solutions included: (i) Self-efficacy (7 items), (ii) Fear (5 items), (iii) Negative emotions (5 items), (iv) Negative appraisals (4 items) and (v) Social isolation (3 items). Both the rotated component matrix, the scree plot and parallel analysis confirmed the 5-factor solutions, which accounted for a cumulative variance of 74.19%. Item loading in each of the 5-factor solutions ranged from 0.538 (item 2) to 0.997 (item 14). Nine items that failed to load at ≥ 0.35 and those overlapping across the factors were removed. These items included the following: relaxed (17), hopelessness (20), longing for the child (21), behaving badly (25), funny (28), natural (29), obvious (30), the child will die, (32) and child will be injured (33). The reliability of the internal consistency for the total scale was 0.914 while the individual factors had the following: lack of self-efficacy 0.962, fear 0.864, negative emotions 0.867, negative appraisal 0.899, and social isolation 0.967.

Confirmatory factor analysis (CFA)

In the current study, CFA using maximum likelihood (ML) was conducted to determine the unidimensional fit of the original W-DEQ-A scale as well as testing the five-factor structure realized by the EFA. We evaluated the goodness of fit of the model by using fit indices in AMOS-25 software. The single factor model comprising of all the 33 items of the original W-DEQ-A resulted in a poor model fit ($\chi^2/df = 16.975$, RMSEA = 0.252, CFI = 0.351, TLI = 0.309) and as such the findings of the current study failed to support the unidimensional structure of the original W-DEQ-A. In the next step, we compared the five-factor solution

comprising of 24 items retained from EFA, and this recorded much-improved fit indices ($\chi^2/df = 6.06$, RMSEA = 0.157, CFI = 0.8661, TLI = 0.841). The CFI and TLI were within the acceptable fit of ≥ 0.85 and ≥ 0.80 respectively (Fig. 1) but RMSEA was >0.08 . Finally, we compared the original 33-item one-factor model with other factor models that have been published in studies from Malawi [24], Hungary [9], Norway [23], Australia [26], Japan [22], United Kingdom [25] Sweden [2], and Italy [21] (Table 3).

Convergent validity

We performed the Spearman’s rank correlation coefficient between the five factors derived from EFA of the W-DEQ-A and EPDS and BAI. The result indicated a significantly strong correlation between the two scales and all the five factors of W-DEQ-A except social isolation and BAI which was 0.485 as indicated in Table 4.

Internal consistency

Table 2 shows Cronbach’s alpha coefficient of all five factors. Three of the five factors had all their values above 0.8, an indication of good reliability while the other two had values above 0.9 which is an indication of excellent reliability.

Discussion

This was the first study performed to validate the Swahili version of the W-DEQ-A scale in pregnant women in the wider East and Central African region, which predominantly uses the Swahili language and more particularly in Kenya since where Swahili is used as a national language. The results of the analyses confirmed the multidimensionality of the W-DEQ-A and produced five-factor solutions namely: lack of self-efficacy, fear, negative emotions, negative appraisals, and social isolation. In the final model, 9 items were removed from the original 33-item

Table 2
Factor loadings using Rotated Component Matrix.

Items	Factor				
	1. Lack of Self Efficacy	2. Fear	3. Negative Emotions	4 Negative Appraisals	5 Social Isolation
No. 4 Not strong	0.986				
No. 5 Not confident	0.918				
No. 9 Not safe	0.975				
No. 10 Not independent	0.989				
No. 16 Not composed	0.857				
No. 22 No self-confidence	0.809				
No. 26 Not let happen	0.692				
No. 6 Afraid		0.902			
No. 12 Tense		0.977			
No. 19 Panic		0.942			
No. 23 Trust		0.924			
No. 27 Lose control		0.939			
No. 2 Frightened			0.538		
No. 8 Weak			0.765		
No. 11 Desolate			0.809		
No. 24 Pain			0.885		
No. 31 Danger			0.846		
No. 1 Not fantastic				0.648	
No. 13 Not glad				0.774	
No. 14 Not proud				0.997	
No. 18 Not happy				0.828	
No. 3 Lonely					0.755
No. 7 Deserted					0.705
No. 15 Abandoned					0.706
Eigenvalues	8.555	7.319	2.282	1.898	1.327
Percentage of variance	30.555	26.138	8.148	6.779	4.739
Cronbach’s alpha	0.962	0.864	0.867	0.899	0.967

Exploratory factor analysis: Maximum likelihood method and Promax with Kaiser Normalization was used as a rotational method. The rotation converged in five factors.

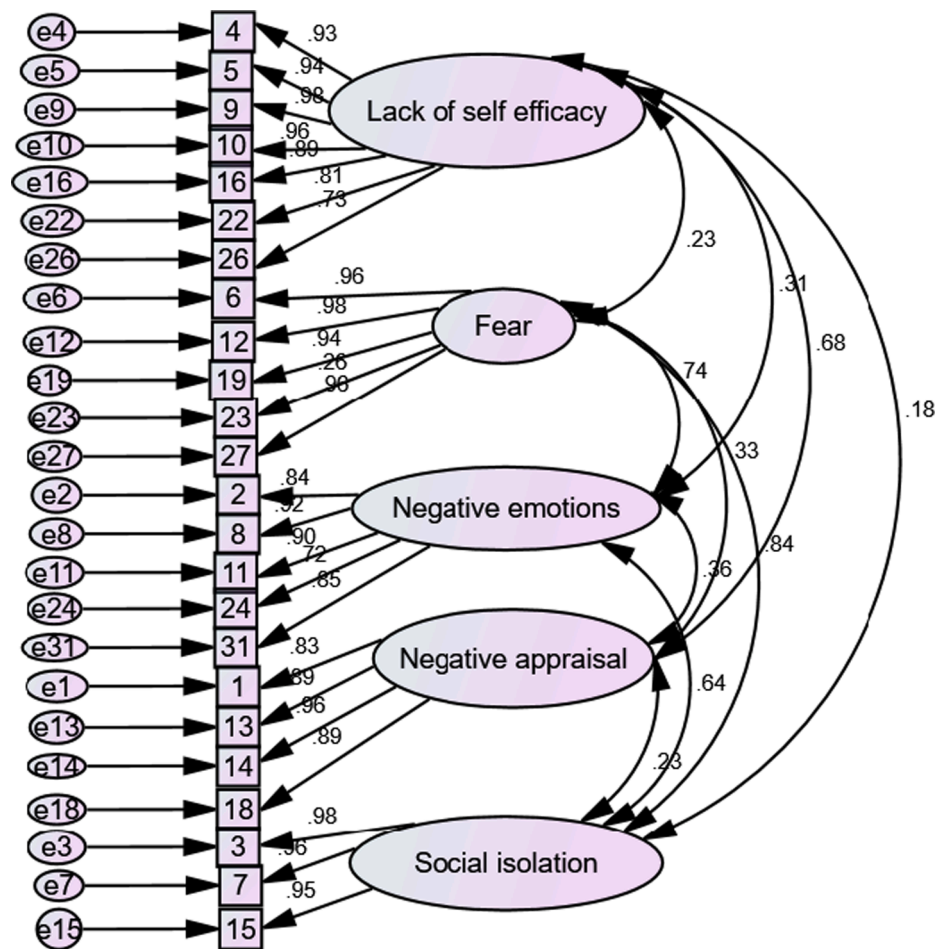


Fig. 1. Confirmatory factor analysis model of the Swahili version of the W-DEQ-A 24 item- 5-factor model.

Table 3
Comparing fit statistics from CFA of W-DEQ-A factor models from other countries.

Model	Country of study	Number of items	χ^2	df	p	RMSEA	CFI	TLI
1 -Factor	Sweden [2]	33	1204	495	<0.001	0.08	0.54	0.51
4 -Factor	UK [25]	33	2116	434	<0.001	0.141	0.513	0.546
4 -Factor	Japan [22]	33	2679.262	495	<0.001	0.136	0.520	0.550
4 -Factor	Australia [26]	27	2938.47	318	<0.001	0.11	0.90	0.89
6 -Factor	Norway [23]	25	1090.23	260	<0.001	0.044	0.94	0.93
4 -Factor	Hungary [9]	30	1118.406	378	<0.001	0.076	0.90	0.885
3 -Factor	Malawi [24]	23	571	227	<0.001	0.07	0.75	0.70
4 -Factor	Italy [21]	16	504	147	<0.001	0.70	0.90	0.91
5 -Factor	Kenya ¹	24	1466.538	242	<0.001	0.157	0.861	0.841

Note: ¹the current study.

Table 4
Spearman's product correlation coefficient of EPDS, BAI and W-DEQ-A factors.

Measures	W-DEQ-A Factors				
	Lack of self-efficacy	Fear	Negative emotions	Negative appraisals	Social isolation
Edinburgh Postnatal Depression Scale	0.714**	0.657**	0.702**	0.674**	0.516**
Beck Anxiety Inventory	0.686**	0.620**	0.686**	0.674**	0.485**

** p < 0.01.

scale, which had shown a poor model fit; to achieve an overall model fit that was satisfactory. The confirmation of the multidimensionality of the W-DEQ-A in the current study has been demonstrated in numerous studies undertaken in various parts of the world [9,21–24,26].

Initially, the original W-DEQ-A was translated to the Swahili version of W-DEQ-A through a rigorous process similar to other studies that validated the tool in other languages. This process was meticulously done to uphold the cognitive equivalence, as per the established procedures [41].

The five-factor solutions obtained in the current study were coherent but not fully identical with those identified in other studies on the W-DEQ-A. The factor loadings in a recent study in Malawi [24] identified the three-factor model and four-factor loadings were obtained in similar studies in Hungary, Japan, and Australia [9,22,26]. There was also a six-factor model in a similar study in Norway [23].

In the current study, the first-factor loading was named “lack of self-efficacy” which had seven items namely; strong (item 4), confident (item 5), safe (item 9), independent (item 10), composed (item 16), self-confidence (item 22), and let happen (item 26). Similar factor loadings were deduced in similar studies conducted in Norway [23] and Malawi [24] with identical items as the current study. However, Malawi’s study identified three more items namely: funny (item 28), longing for the child (item 21), and trust (item 23). A similar study in Italy had three items, two of which are similar to the current study (item 9 and 22) but the authors named the factor loading as “lack of confidence” [21].

Our second-factor loading was named “fear” and had five items. Similar studies in Malawi [24], Hungary [9], Japan [22], Italy [21], and Norway [23] have identified similar item loadings. In particular, items 12 (tense) and 6 (afraid) were observed in all the five studies mentioned above. Items 27 (lose control), and 19 (panic) were common among the Japanese, Italian, and Norwegian studies. The third-factor loading was named “negative emotions” with 5-items and this finding was similar to a study in Australia [26], which had at least 3 items similar to the current study.

The fourth-factor loading was named “negative appraisal” and the same name was given in similar studies in Hungary and Malawi [9,24]. In both studies, items 1 (fantastic), 13 (glad), and 14 (proud) were similar. Lastly, the fifth-factor loading was named “social isolation” with three items. The same name has been given in similar studies undertaken in Australia [23], Japan [22], and Hungary [9]. Although the item loadings in a similar Norwegian study is identical with the current study, the factor loading was named “loneliness” [23]. Similarly, the factor loading in the Hungarian study was named “isolation” with at least two items agreeing with the current study.

There are other factor loadings such as lack of positive anticipation, the moment of birth, riskiness, and concern for the child, reported in various studies [9,22,23,26] that our model was not able to deduce. This might be due to cultural differences influencing understanding and interpretation of some of the items in the original W-DEQ questionnaire as documented in an Australian study [12].

In the initial stage of EFA, 9 items were removed to get an acceptable model fit. Some of the items that were removed include items 17 (relaxed), 20 (hopelessness), 21 (longing for the child), 25 (behave badly), 28 (funny), 29 (natural), 30 (obvious), 32 (the child will die) and 33 (the child will be injured). The removal of these items particularly those about the possibility of pregnant women longing for the child, thoughts of death or injury to the child is an indication that these were not important sources of childbirth fear among the sampled population. This finding agrees with similar studies in Hungary [9], Malawi [24], Australia [26], and Italy [21]. Also, it is worth noting that this finding disagrees with a previous study that reported that the concerns of pregnant women regarding the health and well-being of their unborn baby are among the most significant sources of childbirth fears [42]. The disagreement would be as a result of socio-cultural dynamics in different regions and variance in socio-demographic indicators as reported in a similar study in Russia [43], which noted that FOC is subjective and highly individualistic.

Critically looking at the five-factor loadings in the current study, factor domains such as “negative emotions” (frightful, weak, desolate, pain and dangerous) and “social isolation” (lonely, deserted and abandoned) might provide a significant predictor of the challenges pregnant women face during pregnancy. Therefore, available healthcare models should proactively identify expectant women exhibiting these characteristics to prioritize their maternal needs such as prenatal counselling during antenatal care clinics. A recent study done in Kenya agrees with this finding [8].

The concurrent/convergent validity of the Swahili version of the W-DEQ- A indicated that the scale correlates well and within the acceptable levels with the other two measures of child-birth related depression (EPDS) and anxiety (BAI). This result agrees with a similar study in Hungary which used BAI [9], and in Norway, which used EPDS [23].

Our adopted model also indicated good internal consistency and reliability; the same was noted in the studies undertaken in Hungary and Norway. The Cronbach alpha of the Swahili version of W-DEQ-A was 0.951, an indication of an excellent internal consistency of the instrument. This also demonstrates the robust reliability of the Swahili version of the W-DEQ-A scale.

Strengths and limitations

The findings confirm the good psychometric properties of the Swahili version of the W-DEQ-A. In the current study, all the factor loadings were higher than 0.50, which indicated robustness in the model. The study participants were drawn from both rural, urban, and peri-urban areas and, therefore, the scale can be applied in all settings in future studies. Our sample size for EFA was 376 and 252 for CFA. The minimum required sample for factor analysis is at least 200 participants in each of the two groups, meaning our study met these criteria and therefore, the current study sample is a representative sample and the study findings can be generalized to populations that share characteristics with the study participants. This study is significant as the validated instrument is expected to be used widely in clinical practice and research, specifically in the East and Central African region where the majority of the population uses the Swahili language as a medium of communication. In terms of the current study limitations, pregnant women who had previous negative childbirth experiences and those with a high vulnerability to obstetric complications were excluded from the study, and as such, our results cannot be generalized to pregnant women with obstetric complications. Secondly, the sample was derived from expectant women attending antenatal care clinics and those that could read and write both in English and Swahili languages. In this regard, the applicability of the instrument to illiterate pregnant women not attending antenatal clinics should be done with caution. Finally, the current study used convenient sampling and this might have resulted in selection bias.

Conclusion

Five domains of childbirth fears were derived from the factor analysis in the current study, a confirmation that W-DEQ-A is multidimensional as has been suggested in previous studies. In that regard, the traditional way of calculating the total scale score of the original 33-item W-DEQ-A might be inappropriate. The Swahili version of the W-DEQ-A scale was confirmed to be a valid and reliable instrument for assessing FOC among the Swahili-speaking pregnant women in Kenya and the wider East and Central African region based on the derived acceptable internal consistency of the instrument. The five domains identified in the current study might offer researchers a more refined psychometrically sound effective instrument to investigate the concept of FOC among pregnant women and this can also be applied in clinical practice as suggested in previous studies.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper

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