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Translation and validation of the breast feeding self efficacy scale into the Kiswahili language in resource restricted setting in Thika – Kenya

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ABSTRACT

Background

Exclusive breastfeeding (EBF) is one of the most cost-effective, health-promoting, and disease-preventing intervention and has been referred to as the cornerstone of child survival. Many mothers however discontinue EBF before the end of six months recommended by World Health Organization (WHO) some due to psychosocial issues. Breast feeding self-efficacy scale-short form (BSES-SF), has been used to establish mothers' self-efficacy towards breastfeeding by computing breast feeding self-efficacy (BSE) scores. These scores have been used globally to predict EBF duration. Internationally accepted tools can be used to compare data across countries. Such tools however need to be translated into local languages for different countries and set-ups.

Objectives

The aim of the study was to translate and validate the English BSES-SF into Kiswahili the national laguage in Kenya.

Methods

The study was a pilot study within the main cluster randomized longitudinal study. Pregnant women at 37 weeks gestation were randomly placed into, intervention (n=21) and comparison (n=21) groups. The BSES-SF questionnaire was used to collect data on BSE at baseline and another questionnaire used to collect socio-economic data. Mothers in the intervention were educated on the importance of exclusive breastfeeding (EBF) and skills required while those in the comparison group went through usual care provided at the health facility. Nutrition education was tailored to promoting maternal BSE.

Results

The translated BSES-SF was found to be easy to understand, it showed good consistency and semantic validity. Predictive validity was demonstrated through significant mean differences between the groups. The intervention group had higher EBF rates at 6 weeks post-partum ($\chi 2=6.170$, p=0.013). The Cronbach's alpha coefficient for the Kiswahili version of the BSES-SF was 0.91 with a mean score of 60.95 (SD ±10.36), an item mean of 4.354.

Conclusion

The Kiswahili version of the BSES-SF is a valid and reliable tool and it has utility in breastfeeding promotion.

Keywords: Validation, Breast Feeding, Self Efficacy Scale, Kiswahili

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INTRODUCTION

Breastfeeding is one of the most cost-effective, health-promoting, and disease-preventing intervention and has been referred to as the cornerstone of child survival.[1] In addition breastfeeding infers health benefits hence WHO recommends exclusive breastfeeding (EBF) for the first six months of a child's life as it has adequate nutrients, the potential to significantly reduce infant mortality and protect them against infection and disease.[2,3] The rates of exclusive breastfeeding in the world are however low with only three in every ten (30%) children aged 1–5 months being exclusively breastfed.[1] In East Africa the rates vary from 22.9% in Tanzania 41% in Uganda and 61.2% in Kenya,[4-6] which is low compared to the expected 90% rate by WHO and 80 % that was targeted by the Ministry of Health by 2017.[7]

Predictors of exclusive breastfeeding (EBF) duration have been identified to include demographic attributes such as maternal age, marital status, education level, and socioeconomic status. All these factors are however nonmodifiable[8-10]. Similarly some modifiable variables have been identified to include attitude, social expectations and self-efficacy.[11-14]

Key of the modifiable factors identified in literature is the breastfeeding self-efficacy, which refers to a mother's perceived ability to breastfeed her new infant. This is a salient variable in breastfeeding duration,[8] as it predicts whether a mother chooses to breastfeed, how much effort she will expend, whether she will have self-enhancing or self-defeating thought patterns, and how she will emotionally respond to breastfeeding difficulties. In particular, efficacious mothers are more likely to choose breastfeeding, persist when confronted with difficulties, employ self-encouraging thoughts, and react positively to perceived difficulties.[15] A mother's breastfeeding confidence is positively correlated with the length of breast feeding.[16] Modifiable factors can be manipulated by healthcare providers and therefore provide an opportunity for them to effect significant change in behavior.

Many studies documenting breastfeeding attitudes and validating the English version of the breastfeeding self-efficacy (BSES short form) have been carried out previously in a range of settings.[17-20] No study to the best of the researcher's knowledge has been published in this area in any African Country. There is no publication on the validation and translation of the English version of the BSES-SF into *Kiswahili* in Kenya. This study was, therefore, necessary given the fact that as indicated above, the latest KDHS survey,[6] indicates that rates of EBF in Kenya are 61.2% at six months. If the WHO accepted rate of 90% is to be achieved, interventions found to be effective in other parts of the world should be implemented. Such interventions include those based on the self-efficacy theory. This study therefore sought to translate, validate and adapt the BSES-SF tool in a resource restricted urban setting in Kenya and document the tool's ability to influence breastfeeding efficacy score of mothers and breastfeeding exclusivity. The use of global validated tools allows for comparison of results from different settings.

MATERIAL AND METHODS

Sampling Procedures

Validation of the tools was done using 10% of the sample selected from pregnant women attending Maternal Child Health (MCH) clinic in Thika level 4 hospital. They were drawn from 4 villages of low social economic areas. The villages were randomized into either intervention or comparison group and pregnant women who meet the inclusion criteria were recruited into their respective groups. The inclusion criteria included being 37 weeks gestation, without a history of chronic disorders such as hypertension, diabetes, HIV and tuberculosis and be more than 18 years and be, planning to reside in Thika for the first six weeks post-partum. Twenty one (21) women were recruited into either group. The intervention group received personalized nutrition education at the health facility and followed up in the homes by community health workers (CHWs) while the comparison group received usual care offered in the antenatal clinic. The aim of the nutrition education was to improve the confidence of the mothers in EBF.

Ethical Approval

Ethical clearance was obtained from Egerton University Ethics committee (Ref: EU/DVRE/028) and the research permit (NCST/RCD/12A/013/64) from the National Council for Science innovation & Technology. All participants voluntarily gave informed consent and were assured of anonymity and confidentiality.

Instruments

Breastfeeding confidence was assessed using the Cindy-Lee Dennis Breastfeeding Self-efficacy Scale-short form with 14 items, (BSES -SF)[16]. The BSES is a form of Likert scale indicating the degree of confidence on a five point scale that ranges from "not at all confident" to "always confident" with a possible score of 14 to 70. Mothers were asked to rate their confidence to the 14 items. A higher score indicates more confidence. The modifying factors found to indirectly influence EBF duration (in this study the marital status, age, education, family income, household food security and individual dietary diversity) were sought to determine their influence on EBF.

Data analysis

The Statistical package for social sciences computer programme (SPSS version 20) was used for computation of descriptive and inferential statistics.

RESULTS

Sample Characteristics

A total of 42 women (21 in each study group) were entered enrolled into the study. The mean age was 22.81 (range18-35 SD 4.538) with no statistical difference in the mean age in the groups (p=0.411). The mean birth weight in the intervention group was 3.2±0.35 and in the comparison group 3.10±0.35 with no significant statistical difference between the groups by the independent t-test for equality of means p=0.399.

About 71% of all women in the intervention were married compared to 90% in the comparison group. Men were household heads in about 90% of both groups. Most of the respondents were primary school drop-outs (47.62%) 28.57% in the intervention and 21.43% in the comparison group. Over all secondary school drop outs were 33.33%, 14.28% in the intervention and 19.05% in the comparison group while those who had college education were 16.66%, 7.14% in the intervention and 9.52% in the comparison group. There was no significant statistical difference between the two groups by Fisher's Exact test, p=0.516. A majority 57.14% were expecting their first child with no significant statistical difference between the two groups by Fisher's Exact test, p=0.643.

Translation and Face Validity

To ensure content, semantic and technical equivalence were ascertained, the English version was translated into *Kiswahili* with the help of a linguist from Egerton University. The *Kiswahili* questionnaires were then translated into English through blind back-translation by a neutral person, who was not involved in the original translation, was not familiar with the tools to reflect on any major deviations and is not a nutritionist. Blind back translation ensures semantic equivalence which ascertains that the meaning of each item remains the same after translation into the target language.[21]

Seven modifications were made to the BSES scale items. In addition the phrases on the Likert scale "not at all confident", "not confident", "sometimes confident, "confident" and "very confident" were back-translated as "completely have no faith", "have no faith", "sometimes have faith", "have faith" and "have a lot of faith" from the Kiswahili word "nina imani/ sina imani

Original Scale

Blind Back-translated scale

1) To determine to recognize
2) To successfully cope with to maintain breastfeeding
3) Giving other feeds giving other foods and drinks for the first 6 months
4) Properly latched properly put on the breast
5) Breastfeeding demand breastfeeding needs
10) Always deal with the fact always contend with the fact

12) When he/she is unwell, when he/she is sick

Translation errors were assessed by the research team for errors and additions of words that would unnecessarily change the meaning of the original tools.

Content Validity

Content validity was ensured through the review of the tools by nutrition professionals and supervisors. The research team also assessed the content of the translated tool verses the contextual meaning. Content equivalence was established by determining whether the content of each item of the tool was relevant to the target group (Content equivalence was evaluated by four nutrition experts in the study area. The criteria used in the evaluation included three items:

1) Content relevant to ensure EBF for the first 6 months
2) Clear and concise meaning
3) Clear distinction among the items in the questionnaire.

Three (3) modifications were made to the BFSE-SF scale as shown below:

*3)" Ninaweza kumnyonyesha mtoto wangu bila kumpatia vyakula vingine (*I can always breastfeed my baby without giving other feeds) *was changed to ninaweza kumnyonyesha mtoto wangu bila kumpatia vyakula vingine hadi mwezi sita itimie" (*I can always breastfeed my baby without giving other feeds until six months are over).

*4) "Ninaweza kuhakikisha kuwa mtoto wangu ameshikilia titi vyema wakati wote wa kunyonyesha" (*I can always ensure that my baby is properly latched on for the whole feed*) was changed to "ninaweza kuhakikisha kuwa mtoto wangu ameweka titi vizuri kwa mdomo wakati wote wa kunyonyesha" (*I can always ensure that my baby is holding on to the breast properly for the whole feed*).*

*14) "Huweza kujua wakati mtoto wangu amemaliza kunyonya" (*I can always tell my baby is finished breastfeeding*) was changed to "huweza kujua wakati mtoto wangu ameshiba"* (I can always tell when my baby is satisfied).

The team reassessed the BSES-SF scale after the changes and agreed that the *kiwashili* version was clear, and relevant to the target group. The above process was carried out in a study that translated the original BSES-SF from English into the Chinese language.[16]

Construct Validity

Construct validity for the BSES-SF was assessed using the principal components factor analysis, comparison of contrasted groups, and correlations with measures of similar constructs. Factor analysis was used in order to evaluate the strength and patterns of correlations of individual scale items with the theoretical concepts and determine the underlying structures of the translated BSES-SF. The suitability of factor analysis for the data was evaluated by the use of the correlation matrix and found suitable since correlations exceeding 0.30 were 82% showing a strong inter item correlation, way above the 73% in a different study[16.] In addition the Kaiser-Meyer-Olkin used to measure sampling adequacy was 0.855, exceeding the recommended 0.60[22].

To allow for a more interpretable factor solution, a principal component extraction with varimax rotation (orthogonal) was performed. The varimax rotation yielded three components as indicated in the Table below. Rotation converged in 10 iterations.

Table 1 Rotated Component Matrix for BSES-SF

		Components		
		1	2	3
1	*Ninaweza kutambua iwapo mtoto wangu anapata maziwa ya kutosha* I can always determine that my baby is getting enough milk	**.785**	.240	-.034
2	*Ninaweza kupambana na shughuli ya unyonyeshaji sawa na jinsi ninavyoweza kukabiliana na shughui nyinginezo* I can always successfully cope with breastfeeding like I have with other challenging tasks	**.562**	.329	.113
3	*ninaweza kumnyonyesha mtoto wangu bila kumpatia vyakula vingine hadi mwizi sita itimie* I can always breastfeeding my baby without giving other feeds	.466	**.611**	.026
4	*Ninaweza kuhakikisha kuwa mtoto wangu ameshikilia titi vyema wakati wote wa kunyonyesha* I can always ensure that my baby is properly latched on for the whole feeding	**.903**	.066	-.201
5	*Ninaweza kumudu hali yote ya unyonyeshaji kwa hali ya kuniridhisha* I can always manage the breastfeeding situation to my satisfaction	**.924**	.042	-.145
6	Ninaweza kumudu kunyonyesha hata kama mtoto wangu *analia* I can always manage to breastfeed even if my baby is crying	**.706**	.102	.354
7	Ninaweza kuendelea kupenda kunyonyesha I can always keep wanting to breastfeed	**.746**	.132	-.015
8	*Ninaweza kunyonyesha hata mbele ya watu wa familia yangu bila kuona haya* I can always comfortably breastfeed with my family members present	**.521**	**-.678**	.302
9	*Huweza kutosheka na kitendo cha kunyonyesha* I can always be satisfied with my breastfeeding experience	**.891**	-.024	-.143
10	*Huweza kukubaliana na ukweli kuwa unyonyeshaji huchukua muda mwingi* I can always deal with the fact that breastfeeding is time consuming	**.665**	-.**539**	.106
11	*Huweza kumaliza kumnyonyesha moto wangu kwa titi moja kabla ya kumbadilisha kwa jengine* I can always finish feeding my baby on one breast before switching to the other	.320	.160	**.873**
12	*Huweza kuendelea kumnyonyesha mtoto wangu hata wakati hajisikii vizuri/ mgonjwa* I can always continue to breastfeed my baby even when he/she is unwell	**.893**	-.047	-.119
13	*Huweza kukabiliana na kutimiza mahitaji ya mtoto wangu ya kunyonya* I can always manage to keep up with my baby's breastfeeding demands	**.919**	-.083	-.125
14	*Huweza kujua wakati mtoto wangu amemaliza / kutosheka kunyonya* I can always tell my baby is finished breastfeeding	**.614**	-.205	-.212

**** Figures>0.5 indicate a significant contribution of the item***

In component 1 all factors loaded around the breastfeeding technique and intrapersonal thoughts sub-scales with only 2 items having a factor of less than 0.5 (Table 1). All the 14 items loaded on this factor and ranged from 0.92 to 0.32. A 0.32 value is

recommended for item retention[23] and therefore all items were retained. Three items loaded simultaneously and significantly in component 1 and 2, relating to breastfeeding technique and intrapersonal thoughts. One item in the breastfeeding technique sub-scale loaded on the third component. To replicate the original methodological study[16], a one factor component was requested. Only 53.6% variance was explained while 78.6% of the items had values greater than 0.32.

Predictive Validity

BSES-SF predictive validity was evaluated by determining the relationship between the tools and exclusive breastfeeding as recommended[22]. Determining the relationship between breastfeeding self-efficacy, and infant feeding method at 6 weeks postpartum was therefore used to assess the predictive validity of the scale. Exclusive breastfeeding was defined as receiving only breastmilk with no other liquids or solids, with the exception of drops or syrups consisting of vitamins, mineral supplements, or medicines. Infants who had recieved pre lacteal feeds were therefore considered to be predominantly breastfeeding but not being EBF.

By both Pearson Chi-Square and Fisher's Exact test the duration of EBF in the two groups (intervention and comparison) were significantly different, χ^2=6.170 with *p*=.013 and 0.023 for the two tests respectively (Table 2 below).

Table 2 Coefficient of Logistic Regression for Effect of BFSE in Predicting EBF at 6 WeeksPost-Partum (N=39)

Predictors	B	S.E.	Wald	Sig.	Exp (B) OR
Totals BFSE at 6 weeks	.755	.304	6.166	.013	2.127
Totals BFSE recruitment	.132	.090	2.161	.142	1.141

Reliability

Internal Consistency

The reliability of the translated version of the *Kiswahili* tools was determined using internal consistency technique. A score from one item was correlated with score from other items in the instruments. The Criteria used included

1) Cronbach's Coefficient Alpha which is a generated form of Kuder-Richardson K-R 20 formula was computed to determine reliability. When a Coefficient of 0.7 was achieved, the instruments were considered reliable.
2) Corrected item-total correlation, and
3) Alpha estimate when an item was dropped from the scale. This criterion was used in similar studies that validated the BSES-SF scale into the Chinese version[16,19] into Indonesia[18] and into Brazil[18].

The Cronbach's alpha coefficient for the *Kiswahili* version of the BSES was 0.909 with a mean score of 60.95 (SD ±10.36), an item mean of 4.354, ranging from 3.69 to 5.595 and an item variance of 1.193, ranging from 0.539 to 2.268. Finally, the mean inter item correlation was 0.468. These results did not differ with those of the initial BSES -SF, which had a scale mean of 55.88 (*SD* ±10.85), item mean of 3.99, ranging from 3.71 to 4.13, a variance of 1.04, ranging from 0.75 to 1.56; the mean inter-item correlation was 0.55, ranging from 0.41 to 0.73.

DISCUSSION

The BSES-SF has been used in many countries to assess mothers' breastfeeding confidence. The psychometric analyses reveal that the translated and validated BSES-SF *Kiswahili* version was consistent with the original study. Hence it is a valid and reliable measure of maternal confidence in breastfeeding. The translation process involved a blind back translation to ensure content, semantic and technical equivalence. Content validity was ensured by nutrition professional at the department of Human Nutrition in Egerton University and content equivalence determined by examining the fourteen items for cultural similarity by four nutritionists from the study area. Face validity was ascertained through

the pilot study (whose results are presented here) before adapting the tool for the larger study.

Factor analysis in the un-rotated matrix yielded a three factors solution explaining 71.88% of the total variance. This was different from the original BSEF-SF[16] which produced a one factor solution explaining 58.35%. The results were also different from a different study[18] who found a 4-factor solution with an eigenvalue greater than 1 which explained 50.75% variance in the Brazil version. The authors attributed this to cultural or other environmental differences. The differences between the original version and the present study may be attributed to differences in social-cultural differences among the Canadian population studied in the original version with the present (resource restricted urban Kenyan population). The notably negative significant relationship on the item "ability to breastfeed in public" and "ability to EBF until 6 months" could be that many African mothers believe breastfeeding in public as not acceptable while giving breast milk alone for the first six months is generally seen as being inadequate.

Less variance was explained when a one factor component was requested to model the original version although 78.6% of the items had values greater than 0.32 still showing strong inter-item correlation. This differed slightly with the original study[16] that explained 58.35% of the variance. This difference might have been due to the socio-economic and cultural differences among the two populations involved in the study and differences in the sample sizes.

The internal consistency using Cronbach's alpha coefficient of the *Kiswahili* version was 0.91 and compared well with what was obtained in the original version of 0.94[15] and met the accepted threshold for established tools. This is an indication of a good correlation. It exceeded that of BSES -SF translation into Indonesia of 0.77[19] and the Brazilian translation of 0.74[18].It was slightly lower than that of BSES -SF translation into Japanese, of 0.95[17]. The inter item correlation results modeled those of the original tools an indication that the *Kiswahili* translated BFSE-SF version was reliable for identifying mothers who were at risk of early termination of breastfeeding hence enable planning for interventions to assist them.

The BSE scores taken at 6 weeks were able to predict EBF duration while baseline BSE scores did not. This means that scores may have improved through nutrition education based on the breast feeding self-efficacy theory. Hence were able to influence mothers in their choices in infant feeding. Despite the fact that the infant feeding data was based on the 24 hour recall which mainly relies on self reports, the findings indicate that this tool is valid and can be used to identify mothers who are at risk of early cessation of EBF even in the Kenyan set up. Similar results have been reported in various studies.[15-17]. Although through the present study reliability and validity of the BSES-SF was illustrated among the study population, studies are required to evaluate the psychometric properties of the *Kiswahili* BSES-SF among populations leaving in different settings. The present validation was among people in a resource restricted urban area.

CONCLUSION

The present study provides support for the theoretical hypothesis that breastfeeding self-efficacy is predictive of breastfeeding exclusivity. The *Kiswahili* breastfeeding self-efficacy tool is valid and reliable and has utility in breastfeeding promotion. The tool can be used in identification of women at risk of early cessation of EBF as well as those likely to succeed. Those mothers with a high breastfeeding self efficacy score during the antenatal period, further breastfeeding support may be unnecessary but positive attributes can be recognized and reinforced to encourage them to continue in the positive behaviour. However, for mothers whose breastfeeding self-efficacy score is low, interventions in the various aspects of the breastfeeding self-efficacy construct can be implemented. Interventions may be linked to breastfeeding techniques (such as positioning of the breast to ensure proper latch on) or the intrapersonal thoughts (such as specific confidence-enhancing strategies). Anticipatory guidance can also be given to these mothers to help them deal with issues that arise during breastfeeding after being discharged to prevent breastfeeding related stress.

The BSES-SF could also act as an important diagnostic tool to evaluate interventions so as to ensure that interventions are responsive to those they are intended for as well as such interventions efficacy.

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