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Highlights

- Father support in breastfeeding plays a crucial role in attaining successful breastfeeding.
- The Partner Breastfeeding Influence Scale (PBIS) is a scale used to measure fathers' perceptions regarding providing breastfeeding support.
- In this study, the PBIS was adapted to the Ethiopian context and demonstrated acceptable reliability and validity among Afaan Oromo-speaking fathers.

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Abstract

Aim: This study aimed to translate the partner breastfeeding influence scale (PBIS) to the Afaan Oromo language and determine its psychometric properties

Methods: A cross-sectional study involving 320 fathers of infants under six months old was conducted with a 4-week retest. The scale underwent translation and back-translation before its psychometric evaluation. Its content validity was determined using the Content Validity Index (CVI), while construct validity was assessed through Exploratory Factor Analysis (EFA). The scale's reliability was evaluated using Cronbach's alpha and intraclass correlation coefficient (ICC). Mean differences in father breastfeeding support by sociodemographic factors were analysed using independent t-tests and one-way ANOVA.

Results: The EFA conducted on the scale resulted in a 31-item with a five-component structure, demonstrating excellent reliability. The overall scale showed a Cronbach's alpha of 0.96, while the subscales for breastfeeding savvy, helping, appreciation, breastfeeding presence, and responsiveness recorded Cronbach's alpha values of 0.88, 0.92, 0.89, 0.89, and 0.74, respectively. The scale demonstrated high test-retest reliability (ICC=0.96) and strong content validity (item-level CVI: 0.86-1.00; scale-level CVI: 0.98). Father's age, number of children, education, employment, and income correlated significantly with their breastfeeding support levels.

Conclusion: The study found that the Afaan Oromo version of the Partner Breastfeeding Influence Scale (PBIS-AO) is a reliable and valid tool for assessing father support for breastfeeding among Afaan Oromo-speaking fathers in Ethiopia.

Implications to Practice: The validated tool can enhance evidence-based practice by providing healthcare professionals with reliable instruments to evaluate patient outcomes, interventions, and informed decisions on breastfeeding practices.

Keywords: Cultural adaptation; Breastfeeding; Psychometric properties; Afaan Oromo; Fathers

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Measuring the role of fathers on breastfeeding success: psychometric properties of Ethiopia's Afaan Oromo version of the Partner Breastfeeding Influence Scale

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Introduction

Optimal breastfeeding practices encompass initiating breastfeeding shortly after birth (within 1 hour), maintaining exclusive breastfeeding for the first 6 months, and thereafter incorporating complementary foods while sustaining breastfeeding up to 2 years of age (WHO, 2023b). Breastfeeding is an ideal way to nourish a child, supporting both their immune system and brain development. It goes beyond mere nutrition; it acts as a potent medicine specifically designed for an infant's needs, significantly lowering the risk of mortality. If practiced universally, breastfeeding has the potential to save the lives of 820,000 children under the age of five each year worldwide (UNICEF, 2019). Breastfeeding also promotes a unique bond between mother and child, providing emotional security and comfort (Modak et al., 2023).

Despite World Health Organization (WHO) recommendations on optimal feeding, fewer than half of babies were exclusively breastfed globally in 2020 (WHO, 2023b). The rate of continuation of breastfeeding after six months is also sub-optimal. Evidence showed that 71% of mothers breastfeed their child for the first year, but by the time the child is two years old, only 45% of mothers breastfeed their child (WHO, 2023a). In Ethiopia, 59% of infants under six months are exclusively breastfed. This indicates that 41% of infants in this age group do not receive exclusive breastfeeding. Six percent of infants under 6 months are not breastfed at all. Exclusive breastfeeding rates decline with age, from 73% at 0-1 months to 40% at 4-5 months. Additionally, 9% of infants under 6 months use a bottle with a nipple, which is discouraged due to the risk of illness (The DHS Program & ICF, 2019). While exclusive breastfeeding (EBF) and sustained breastfeeding rates appear to be higher than the global average, enhancing EBF practices and breastfeeding continuation remains essential. This is particularly important in low-income countries like Ethiopia, where breastfeeding is the most cost-effective option. Furthermore, the rate of exclusive breastfeeding (EBF) has not seen much improvement in recent years, with only a 1% increase from 58% in 2016 to 59% in 2019 compared to previous years (CSA, 2016; The DHS Program & ICF, 2019). A systematic review and meta-analysis conducted in Ethiopia also showed that the prevalence of EBF was 60.4% (Wake & Mittiku, 2021) nearly similar to the national report. Moreover, a study carried out in the Arsi zone of Ethiopia revealed that over a third of infants were engaged in bottle feeding, indicating a substantial portion were not exclusively breastfeeding (Hunde et al., 2023).

In addition to exclusive breastfeeding, it is recommended that a child continue to breastfeed until age two. However, in Ethiopia, the percentage of currently breastfed children has decreased from 85% among children aged 12-17 months to 76% among children aged 18-23 months. Several factors related to personal, institutional, and social factors have contributed to the success of exclusive and continued breastfeeding; one aspect that affects the success of breastfeeding is the support that women receive, especially from their partners (Ayalew, 2020; Felix Akpojene Ogbo et al., 2020). Breastfeeding success requires more than just the mother's effort because it is a challenging task and requires support from others (Basrowi et al., 2024). Evidence from a systematic review indicated that husband support in terms of verbal encouragement and assistance in household chores and childcare tasks had a positive influence on the initiation and continuation of breastfeeding (Felix Akpojene Ogbo et al., 2020). Other studies similarly showed that early postpartum breastfeeding support increased the likelihood that mothers will continue breastfeeding after childbirth (Baldwin et al., 2021; Hunter & Cattelona, 2014). According to research conducted in Western Australia, Singapore, and Ethiopia, fathers' emotional, practical, and physical support plays a critical role in the effectiveness of breastfeeding (Ayalew, 2020; Regina Ng Wan Leng et al., 2019; Tohotoa et al., 2009). These demonstrate the importance of incorporating father support into the breastfeeding promotion program to improve breastfeeding success.

In Ethiopia, fathers are the head of the household and can influence their spouses' decision-making. According to study findings on the role of fathers in improving maternal and infant health care, fathers have multiple roles like being decision makers, providing financial support, helping their partners with workloads, and advising and supporting them in breastfeeding (USAID/ENGINE, 2014). Furthermore, the involvement of fathers enhances birth preparedness and complication readiness before childbirth and recommended breastfeeding practices after childbirth (Tadesse et al., 2018; Tewabe et al., 2016). Examining the father's support on breastfeeding is critical as fathers' support can influence mothers' breastfeeding decisions and behaviour (Agrawal et al., 2022; Gebremariam et al., 2024). According to this literature, family, especially the spouse, can greatly impact the mother's decision to initiate and continue breastfeeding. They also significantly influence the early postnatal period, often contributing to the early cessation of proper breastfeeding.

While there are various tools to assess the breastfeeding support perceived by nursing mothers, there is a lack of adequate instruments to measure the perceived support given by fathers. It is

critical to consider the perception of breastfeeding support from the father's perspective, including the forms and degree of support. A standardized measurement tool is required to understand fathers' self-perception regarding their role in providing breastfeeding support and evaluate the dimensions of partner support. Addressing the absence of such a standardized measure, Rempel and Rempel developed the initial scale, which continues to be used by researchers. It is a 33-item scale with a 5-point Likert scale with five dimensions of support: breastfeeding savvy, helping, appreciation, breastfeeding presence, and responsiveness (Rempel et al., 2017). This tool was originally developed in Canada, where the EBF rate and median duration were 35% and 15 months, respectively (Chan et al., 2023). Since then, various studies have evaluated the perception of father support in breastfeeding. For instance, the PBIS has been adopted in Turkey and demonstrated acceptable reliability and validity (Buldur, 2019), where exclusive and sustained breastfeeding were 41% and 22 months, respectively (Hacettepe University, 2019). In Malaysia, the scale was used to investigate the relationship between fathers' breastfeeding support and the duration of exclusive breastfeeding (Phua et al., 2020), where the EBF rate is 47.1%, and the median breastfeeding duration is 24 months (IPH, 2016). This evidence shows that the scale remains used across different countries to promote breastfeeding success, with varying rates of exclusive breastfeeding and breastfeeding duration.

In Ethiopia, despite the crucial role of a husband during breastfeeding, the perception of fathers in providing support was not well studied. To our knowledge, there is a lack of culturally relevant instruments to assess the perceived level of breastfeeding support, especially within the Afaan Oromo-speaking community, which constitutes over one-third of Ethiopia's population and is one of the most widely spoken languages in the country (Wikipedia, 2024). This may result in difficulties in consistently assessing the impact of father involvement on breastfeeding outcomes. It could also hinder developing and implementing targeted interventions or policies to enhance fathers' support of breastfeeding practices. Thus, this study aimed to adapt the 33-item partner breastfeeding influence scale and determine its psychometric properties among Afaan Oromo-speaking fathers in Ethiopia.

Methods

The study comprised two main stages: firstly, the translation of the scale from English into Afaan Oromo, and secondly, the psychometric evaluation of the scale's Afaan Oromo version.

Phase I: Translation and back translation of the Partner Breastfeeding Influence Scale (PBIS)

The partner breastfeeding influence scale (PBIS) (33-item) is a scale used to assess husbands' supportive behaviour towards their partners in breastfeeding (Rempel et al., 2017). It can also assess the level of support mothers receive from their partners in breastfeeding practice. This scale was initially developed by Rempel and Rempel in 2011. The scale has five subscales with different reliability scores among men. These subscales are breastfeeding savvy (Cronbach's alpha=0.87), helping (Cronbach's alpha=0.79), appreciation (Cronbach's alpha=0.86), breastfeeding presence (Cronbach's alpha=0.88), and responsiveness (Cronbach's alpha=0.77). Each item is scored on a five-point scale ranging from 1 (Not at all) to 5 (very often) on how often they engage in each behaviour. The highest score shows extremely supportive behaviour while the lowest score shows extremely not supportive behaviour in breastfeeding (Rempel et al., 2017). Translation and cultural adaptation were conducted according to the recommendation of cross-cultural adaptation developed by the Institute for Work and Health in 2007 (Beaton et al., 2000). Permission to validate the scale in the Afaan Oromo language was obtained from one of its original developers, Professor Lynn A Rempel.

First, forward translation of the scales from English to Afaan Oromo was done by two target language experts (one health professional and one Afaan Oromo language expert). Then, the primary investigator and both forward translators synthesized both translations. To preserve the semantic equivalence of the scale, a few wordings have been modified (for example, on item 3, formula feeding was translated as 'milk powder purchased from pharmacy'). Two English language experts then did a backward-scale translation to check its consistency. Then, the team of experts consisting of a nurse, midwife, Afaan Oromo expert, forward translators, and backward translators were invited to examine the translated version to ensure that it accurately reflects the original tool and consistency of the translation in terms of conceptual semantic, and idiomatic equivalences. They independently rated the relevance of the items to the local context by using the content validity index (CVI) on a 4-point scale: 1 =not relevant, 2 = somewhat relevant, 3 = quite relevant, and 4 = very relevant (Yusoff, 2019). The final Afaan Oromo version was then pre-tested on 15 fathers to obtain feedback on its clarity and cultural appropriateness. After refining the tool, it was subjected to psychometric testing to check its validity and reliability.

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Phase 2: Psychometric testing of the translated scale (BSES-SF-AO)

Study design: A cross-sectional study with a 4-week retest was conducted in Nekemte town of East Wollega Zone, Western Ethiopia.

Study area: The study was conducted in East Wollega Zone (EWZ), Western Ethiopia. Nekemte is the capital town of this zone and is situated 330 kilometers from the country's capital city, Addis Ababa, in the western direction. According to the Ethiopian Statistical Services (ESS), East Wollega zone had a total population of 1,806,001, of which 897,957 were males, and 908,044 were females as of July 2022, while Nekemte town had a total population of 156,004, of which 78,820 were males, and 77,184 were females (ESS, 2022). East Wollega Zone has five public hospitals and more than 55 health centers providing maternal health services.

Inclusion and exclusion criteria: Participants were included if they were 18 years or above, had a child of less than six months, and their child was breastfeeding and could read and understand the Afaan Oromo language. Participants were excluded if they could not provide informed consent due to cognitive impairment or critical illness.

Sample size: The sample size needed for the psychometric testing was determined by the rule of thumb of 10 participants per item (Nicholas D. Myers et al., 2011). The Partner Breastfeeding Influence Scale has 33 items. Accordingly, the desired sample of 330 participants was used.

Data collection techniques: Four data collectors were recruited and trained for one day to collect data from eligible participants. An interviewer-administered questionnaire was used to collect data from eligible participants from house to house. Written informed consent was obtained before they participated in the study. The data collection instrument had two components. The first one was the sociodemographic variables, which consisted of age, educational status, occupation, income, and number of children they had. The second component was a scale consisting of questions assessing perceived breastfeeding support provided by fathers. Data collection took place between December 2023 and January 2024. A subsample of 97 participants was approached for the retest questionnaire after four weeks of the initial data collection. Four data collectors conducted face-to-face interviews at the participants' residences to gather data for the retest.

Method of data analysis: Construct validity of the scale was performed using exploratory factor analysis (EFA) with principal component analysis. EFA was used because the scale was not tested

in the target language and culture and is a critical step for further scale testing. To assess the scale's reliability, Cronbach's alpha was calculated to determine the internal consistency of the items. The test-retest reliability of the scale was determined by the intraclass correlation coefficient (ICC). To check the relationship between the Afaan Oromo version of the scale and the sociodemographic characteristics of the participants, the independent t-test and one-way ANOVA were used. The Mann-Whitney U test was also used to compare the mean differences where appropriate.

Ethical Considerations: Ethical approval was obtained from The Hong Kong Polytechnic University (PolyU) Ethical Review Board (HSEARS20230828006). Additionally, a letter of support was secured from Wollega University (IHSRPTTAD/005/2016). Permission to conduct the study was obtained from the administrators of Nekemte sub-cities (locally known as 'Kebele', Ethiopia's lowest local government unit). Written informed consent was also obtained from the study participants before data collection. Voluntary participation and confidentiality of information was also maintained.

Results

Socio-demographic Characteristics

Three hundred twenty participants completed the interview, making the response rate 96.9%, with the mean age (SD) of 35.9 (+7.3) ranging from 24 to 57 years. Most respondents were protestant in religion (57.8%) and from an Oromo ethnic background (91.6%). Over one-third of the participants had completed college or university, and most were employed (74.1%). The majority of them had more than two children (Table 1).

Table 1. Socio-demographic characteristics of the participants

Variables	**Frequency**	**Percent**
Educational status		
No formal educ.	93	29.1
Primary	21	6.6
Secondary	87	27.2
College or above	119	37.2
Religion		
Protestant	185	57.8
Orthodox	92	28.8
Muslim	28	8.8

Catholic	6	1.9
Wakefata	9	2.8
Ethnicity		
Oromo	293	91.6
Amhara	21	6.6
Others[a]	6	1.9
Occupation		
Employed	237	74.1
Unemployed	83	25.9
Income (ETB)		
<=1300	37	11.6
1301-2200	41	12.8
2201-3600	66	20.6
3601-6500	89	27.8
>6500	87	27.2
Number of children		
One	58	18.1
Two and above	262	81.9

[a] =Gurage, Tigre

Reliability estimate

The internal consistency of the overall scale was evaluated by Cronbach's alpha, corrected-item-total correlation, and intraclass correlation coefficient (ICC). The overall scale has demonstrated a Cronbach's alpha of 0.96, while breastfeeding savvy, helping, appreciation, breastfeeding presence, and responsiveness subscales had a Cronbach's alpha of 0.88, 0.92, 0.89, 0.89, and 0.74, respectively. Cronbach's alpha of more than 0.10 for all items was not increased if the item was deleted. Using a two-way mixed effect model, the retest's intraclass correlation (ICC) was calculated four weeks later on a subsample of ninety-seven participants. The result was 0.96 (95%CI: 0.951-0.976), indicating excellent stability of the scale over time.

Content validity

The content validity of the scale was independently evaluated by seven experts of different backgrounds including nurses, midwives, public health, and language experts. The item-level content validity index and the scale-level validity index (CVI) were calculated. Accordingly, the item-level CVI ranged from 0.86 to 1.00 while the scale-level CVI was 0.98.

Construct validity

a. **Item-total correlation**

The corrected-item-total correlations were positive, ranging from 0.631 to 0.824 for the finally retained items. Two of the scale's items, item 3 from the breastfeeding savvy subscale and item 29 from the appreciation subscale, had an item-total correlation statistic of less than 0.3 (table 2). Due to their poor association with the remaining items, these two items were eliminated from the Afaan Oromo version of the scale. Item 3 was about fathers' experience of learning more about breastfeeding by reading books. Item 29 was about fathers' perception of making breastfeeding easy for their partner to breastfeed while entertaining company or visiting others. As a result, 31 items were retained and subjected to exploratory factor analysis (EFA).

Table 2. Item total correlation of partner breastfeeding influence scale Afaan Oromo version

Item no.	Domain and items	Item total correlation
	Breastfeeding savvy	
1.	Discuss with your partner about how long to continue breastfeeding	.554
2.	Discuss with your partner about how ideas for trying to solve breastfeeding problems or different ways to make breastfeeding to work better	.644
3.	Learn more about breastfeeding by reading books or articles on breastfeeding	**.282**
4.	Tell your partner your opinion about how long you think that she should breastfeed	.651
5.	Speak up in support of your partner when someone makes a negative BF comment	.634
6.	Help your partner get assistance from other for solving breastfeeding problems or improving breastfeeding	.611
7.	Remind your partner of the benefits of BF for her and for your baby	.660
8.	Show patience and a willingness to wait for your opportunity to feed the baby	.698
9.	Support your partner's attendance at a breastfeeding support group	.530
	Breastfeeding helping	
10.	Help out with or take care of other childcare tasks with the baby	.682
11.	Give something up in order to make breastfeeding easier	.678
12.	Help out with other household tasks and responsibilities to free up your partner's time and energy	.641

13.	Help with breastfeeding at night	.690
14.	Care for your baby during and after breastfeeding is done	.786
15.	Try to improve your partner's health and nutrition	.682
16.	Give your partner a break from a baby	.764
	Appreciation	
17.	Encourage your partner to do her beast when it comes to breastfeeding and let her know that she is not less of a mother if she feels like quitting	.768
18.	Praise your partner for breastfeeding and let her know that what she is doing is a beautiful, worthwhile thing	.667
19.	Let your partner know that breastfeeding is natural and/or give her the message that she is breastfeeding because she wants the best for her baby	.742
20.	Listen to and encourage your partner when she is feeling frustrated or discouraged about breastfeeding	.705
21.	Show appreciation that your partner is breastfeeding	.491
22.	Tell your partner that you value and support her mothering decisions and intuitions around breastfeeding	.767
	Breastfeeding presence	
23.	Try to improve the breastfeeding experience by getting equipment or supplies ready for breastfeeding	.642
24.	Act attentively towards your partner during breastfeeding	.774
25.	Quietly share time and watch or hold your partner during breastfeeding	.665
26.	Physically help with BF related activities	.697
27.	Help create a quit, pleasant environment for breastfeeding	.716
28.	Show pleasure and satisfaction while your partner is breastfeeding	.721
	Responsiveness	
29.	Make it easy for your partner to breastfeed while entertaining company or visiting others	**.293**
30.	Respond sensitively and positively to sexual issues	.605
31.	Be patient and understanding of the time it takes to breastfeed and don’t get upset if the other housework is not done	.719

32.	Show your comfort with breastfeeding in public and help her feel comfortable too	.599
33.	Pay attention to how much and how your partner wants to participate in breastfeeding	.743

b. Factor analysis

The dimensionality of the 31-item Afaan Oromo version Partner Breastfeeding Influence Scale (PBIS-AO) was evaluated by exploratory factor analysis (EFA) with principal component analysis. The rotation employed was Varimax with Kaiser normalization, which produced Kaiser-Meyer-Olkin (KMO) static of 0.96 and the Barlette's Test of Sphericity 7205.350 (P<0.001), which indicates sampling adequacy and appropriateness of the factor analysis. The eigenvalue has identified a five-factor scale structure with a 67.8% variance explained. This value is acceptable since at least 50% of the variance explained is generally considered acceptable. The factor loadings of the items were examined, and all were greater than 0.3. The items and their corresponding factor were highlighted in bold in Table 3. The items were loaded onto a subscale corresponding to the original scale except item 28, loaded to the responsiveness subscale instead of its original subscale, breastfeeding presence. Accordingly, this item has been moved to the responsiveness subscale because showing pleasure and satisfaction while their partner is breastfeeding can also be viewed as emotional support and positive reinforcement, which could fall under the responsiveness category. Items that were cross-loaded to other subscales besides their original subscale were kept in their original subscale for the sake of interpretability.

Table 3. Exploratory factor analysis showing the factor structure of PBIS-AO among fathers in Western Ethiopia

	Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
	Breastfeeding savvy					
1.	Discuss with your partner about how long to continue breastfeeding			**.814**		

2.	Discuss with your partner about how ideas for trying to solve breastfeeding problems or different ways to make breastfeeding to work better			**.753**		
3.	Tell your partner your opinion about how long you think that she should breastfeed			**.673**		
4.	Speak up in support of your partner when someone makes a negative BF comment	.339		**.468**		
5.	Help your partner get assistance from other for solving breastfeeding problems or improving breastfeeding			**.517**		.533
6.	Remind your partner of the benefits of BF for her and for your baby			**.625**	.349	
7.	Show patience and a willingness to wait for your opportunity to feed the baby	.437	.381	**.424**	.324	
8.	Support your partner's attendance at a breastfeeding support group			**.351**		.684
	Breastfeeding helping					
9.	Help out with or take care of other childcare tasks with the baby	**.759**				
10.	Give something up in order to make breastfeeding easier	**.746**				
11.	Help out with other household tasks and responsibilities to free up your partner's time and energy	**.738**				
12.	Help with breastfeeding at night	**.646**		.334	.312	
13.	Care for your baby during and after breastfeeding is done	**.569**	.362		.449	
14.	Try to improve your partner's health and nutrition	**.462**	.389	.336	.417	

15.	Give your partner a break from a baby	**.561**		.383	.379	
	Appreciation					
16.	Encourage your partner to do her beast when it comes to breastfeeding and let her know that she is not less of a mother if she feels like quitting		.330	.351	**.614**	
17.	Praise your partner for breastfeeding and let her know that what she is doing is a beautiful, worthwhile thing				**.689**	.417
18.	Let your partner know that breastfeeding is natural and/or give her the message that she is breastfeeding because she wants the best for her baby	.310			**.669**	
19.	Listen to and encourage your partner when she is feeling frustrated or discouraged about breastfeeding	.350			**.636**	
20.	Show appreciation that your partner is breastfeeding		.350		**.496**	.510
21.	Tell your partner that you value and support her mothering decisions and intuitions around breastfeeding		.384	.366	**.545**	
	Breastfeeding presence					
22.	Try to improve the breastfeeding experience by getting equipment or supplies ready for breastfeeding		.552			**.317**
23.	Act attentively towards your partner during breastfeeding	.392	.475		.303	**.435**
24.	Quietly share time and watch or hold your partner during breastfeeding		.440			**.681**
25.	Physically help with BF related activities	.417	.414			**.617**

26.	Help create a quiet, pleasant environment for breastfeeding		.673			**.304**
	Responsiveness					
27.	Show pleasure and satisfaction while your partner is breastfeeding	.301	**.701**			
28.	Respond sensitively and positively to sexual issues		**.737**			
29.	Be patient and understanding of the time it takes to breastfeed and don't get upset if the other housework is not done	.465	**.574**			
30.	Show your comfort with breastfeeding in public and help her feel comfortable too		**.604**			
31.	Pay attention to how much and how your partner wants to participate in breastfeeding	.335	**.564**	.379	.303	

The PBIS-AO overall and sub-scales scores based on sociodemographic groups

In this study, the relationship between the partner breastfeeding support and the demographic variables of the participants was computed. Accordingly, the age of the participants had a negative correlation with the perceived provision of breastfeeding support (r=-0.16, P=0.004). Similarly, having many children had a significant negative correlation with breastfeeding support (r=-0.2, P<0.001). T-test results have also shown that those who were employed had better breastfeeding support provision than those unemployed for the overall scale (t=2.75, P=0.006) and for all subscales except for the responsiveness subscale (Table 4).

The ANOVA result indicated that fathers who had no formal education were less supportive of breastfeeding than those who had completed at least primary education (F=20.47, P<0.001) for the overall support scale. Regarding the breastfeeding savvy subscale, those who completed a college degree and above had higher support in providing breastfeeding information than other educational status categories, and those who completed secondary education had higher support provision than those who had no formal education (F= 25.00, P<0.001). Regarding the breastfeeding helping subscale, those who had no formal education were less supportive than those who had at least

completed primary education (F=25.11, P<0.001). Breastfeeding appreciation is the third subscale in which those participants who had no formal education were less supportive than those who completed secondary education and college (F=10.18, P<0.001). Breastfeeding presence is another subscale in which those who had no formal education supported their partners less than those who at least completed secondary education (F=5.36, P=0.001). Regarding the responsive subscale, those who had no formal education were less supportive than other categories of educational statuses (F=14.04, P<0.001) (Table 4).

There was also a significant difference in overall breastfeeding support between participants who had higher income (>6500 ETB) and lesser income categories (F=4.82, P=0.001). Regarding subscales, those who were employed were more supportive in the form of breastfeeding savvy, helping, and responsiveness than those who were unemployed, while there was no significant difference in breastfeeding presence and breastfeeding appreciation. This study also showed that there was no significant difference in the support provision based on the ethnic background of the participants for the overall scale and subscales (P>0.05) (Table 4).

In general, the scale showed that it could identify differences depending on the sociodemographic characteristics, ensuring the discriminant validity of the scale.

Table 4. PBIS-AO overall and sub-scales scores by different sociodemographic groups (N=320)

Variables	Frequency	BF Savvy	BF helping	BF Appreciation	BF presence	BF Responsiveness	Total score
Mean (SD)							
Employment							
Employed	237	25.10(6.08)	22.65 (5.98)	18.52 (4.85)	15.01 (4.36)	15.64 (4.19)	96.89 (22.45)
Unemployed	83	22.39 (5.53)	20.82 (4.94)	17.25 (4.75)	13.69 (3.87)	15.08 (3.80)	89.2 (20.03)
P-value		0.001	0.044	0.041	0.010	0.269	0.006
Level of education							
No formal education	93	20.59 (3.53)	18.37 (2.92)	16.06 (3.21)	13.33 (2.61)	13.39 (2.49)	81.74 (12.70)
Primary	21	23.90 (6.27)	22.38 (6.98)	17.57 (5.41)	14.05 (5.43)	16.52 (5.03)	94.43 (36.57)
Secondary	87	24.77 (6.99)	23.03 (5.76)	18.87 (5.26)	14.99 (4.82)	15.79 (4.28)	97.46 (24.15)
College or above	119	27.14 (5.64)	24.49 (5.82)	19.46 (4.98)	15.58 (4.43)	16.74 (4.17)	103.4 (20.79)
P-value		<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Income (in Ethiopian Birr)							
<=1300	37	23.05 (6.55)	21.76 (6.73)	17.76 (5.10)	14.16 (4.67)	14.68 (4.08)	91.41 (24.16)

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1301-2200	41	24.22 (5.82)	21.88 (5.56)	18.00 (4.60)	14.22 (4.17)	15.34 (3.81)	93.66 (21.30)
2201-3600	66	23.18 (6.04)	20.77 (5.79)	17.24 (4.73)	14.30 (4.04)	14.58 (4.19)	90.08 (22.73)
3601-6500	89	23.60 (5.31)	20.72 (4.73)	18.36 (4.61)	14.34 (3.99)	15.21 (4.08)	92.22 (19.61)
>6500	87	26.74 (6.23)	25.05 (5.50)	19.01 (5.13)	15.70 (4.50)	16.90 (3.88)	103.39 (21.54)
P-value		0.001	<0.001	0.242	0.131	0.003	0.001
Ethnicity							
Oromo	293	24.62 (6.19)	22.40 (5.89)	18.32 (4.91)	14.83 (4.31)	15.58 (4.14)	95.74 (22.37)
Amhara	21	21.62 (3.84)	19.43 (3.63)	16.33 (3.83)	12.62 (3.28)	14.05 (3.32)	84.05 (15.77)
Others	6	22.50 (4.97)	21.00 (4.34)	18.50 (4.46)	13.83 (3.71)	16.17 (3.55)	92.00 (18.07)
P-value		0.068	0.066	0.192	0.064	0.232	0.060

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Discussion

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Breastfeeding is one of the challenging responsibilities that a lactating mother encounters after every childbirth. Women's breastfeeding decisions require support from others during this period, especially from their spouses besides their situation (Bengough et al., 2022). Husbands may provide support to their partners physically, emotionally, or by being a source of motivation and encouragement (Elliott, 2018). Various studies have shown that there is a positive association between partner support and successful breastfeeding (Mannion et al., 2013; Regina Ng Wan Leng et al., 2019; Tohotoa et al., 2009). In Ethiopia, fathers are viewed as the heads of their households and the primary providers of support for their spouses (Owino & Yigezu, 2023). It is critical to ascertain how fathers view themselves in supporting their partners in breastfeeding to close the gaps surrounding the BF practice. To measure the level of father support during breastfeeding, a validated tool is needed, and in Ethiopia, there is no validated tool used for such purpose currently. Thus, this study aimed to translate and test the psychometric properties of the partner breastfeeding influence scale among fathers who had breastfeeding babies in Ethiopia.

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This study assessed the content validity of the scale using the content validity index (CVI), which was independently evaluated by seven experts. The item-level CVI ranged from 0.86 to 1.00, with a scale-level CVI of 0.98. A CVI of at least 0.83 is considered acceptable for six to eight raters (Yusoff, 2019). Additionally, Exploratory Factor Analysis was utilized to determine the scale's factor structure. The analysis revealed a five-factor structure resembling the original Remper and Remper scale (Rempel et al., 2017). The rotation utilized in the factor analysis resulted in a Kaiser-Meyer-Olkin (KMO) statistic of 0.96 and Bartlett's Test of Sphericity value of 7205.350 (P<0.001), which indicates sampling adequacy and appropriateness of the factor analysis (Brett William et al., 2010).

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The Item-total correlation of the scale was also examined and resulted in the dropping of two items (item 3 from the breastfeeding savvy and item 29 from the appreciation subscales) from the Afaan Oromo version due to poor correlation with the rest of the scale items. These two items may not effectively predict the perceived support provided by fathers regarding breastfeeding. One item focuses on reading articles about breastfeeding, while the other focuses on husbands' endorsement of breastfeeding in public entertainment venues. The weak correlation between these items could be attributed to Ethiopian fathers' limited habit of reading relevant literature, as indicated by their comparatively low knowledge about breastfeeding (Shitu et al., 2021). Additionally, fathers' tendency to inadequately support breastfeeding mothers by encouraging them to breastfeed in public entertainment settings might further explain the lack of correlation between these items.

The overall scale demonstrated excellent internal consistency, yielding a Cronbach's alpha of 0.96. The Cronbach's alpha of above 0.90 is considered excellent (Taber, 2017). This was higher than the original version of the scale (Rempel et al., 2017) but comparable with the Turkish version (Buldur, 2019). The possible reason for the difference with the original scale in reliability coefficient could be due to cultural differences, which may influence how individuals perceive and respond to questionnaire items. In this study, the subscales measuring breastfeeding savvy, breastfeeding presence, breastfeeding appreciation, and responsiveness showed comparable internal consistency to the original version of the scale and the Turkish version (Buldur, 2019), while the helping subscale showed a higher Cronbach's alpha. The internal consistency of the Afaan Oromo scale has also shown stability over time as evidenced by an excellent intraclass correlation coefficient. An ICC greater than 0.90 indicated excellent reliability (Koo & Li, 2016). The subscales' resemblance to the original version and Turkish version demonstrates the scales' consistent reliability across various populations (Buldur, 2019; Rempel et al., 2017).

The group analysis of the scale revealed that the perception of husbands on providing breastfeeding support was inversely correlated with the number of children they had. Similarly, a study conducted in Türkiye showed that fathers who had one child were more supportive of breastfeeding than those who had two children (Hilal Kurt Sezer et al., 2023). This may be because parents with large families had to divide their time and attention among multiple children which may result in

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less individual attention and support for breastfeeding. On the other hand, age was a significant predictor of father breastfeeding support in this study. Younger fathers were more supportive than their counterparts. This is consistent with a study conducted on 250 fathers, which revealed that new and younger fathers were critical to promoting breastfeeding (Samuelson, 2023). Likewise, a Singaporean study found a negative correlation between the fathers' ages and their involvement in providing breastfeeding support (Regina Ng Wan Leng et al., 2019). This may be because younger fathers could be new to fatherhood and thus supportive in breastfeeding to bond with their newborn and actively participate in the care of their child from the very beginning may tend to be more supportive initially, potentially due to their propensity to exert a high level of effort at the outset, which could diminish over time, in contrast to their older counterparts. Nonetheless, age was not a significant predictor according to research conducted in Türkiye (Hilal Kurt Sezer et al., 2023).

There was also a significant difference between employed and unemployed fathers in providing overall breastfeeding support and each category of the support provision. Accordingly, those who were employed were more supportive of breastfeeding savvy, BF helping, BF appreciation, and BF presence. This finding is consistent with a study conducted in Türkiye and Singapore in which higher-income fathers reported offering more support to their spouses (Hilal Kurt Sezer et al., 2023; Regina Ng Wan Leng et al., 2019). The reason why employed fathers are more supportive may be due to financial stability and better awareness and education on the benefits of breastfeeding.

This study also revealed that those who were more educated were more supportive of breastfeeding (BF) than other participants with lower educational status categories. This result is in line with a study from the USA, Türkiye, and Singapore, which found that college-educated fathers were more likely to support breastfeeding their children (Hilal Kurt Sezer et al., 2023; Regina Ng Wan Leng et al., 2019; Samuelson, 2023). This may be because educated fathers are more likely to understand the benefits of breastfeeding and, hence, more supportive (Ljungberg et al., 2024). This support extends to all support categories, such as breastfeeding savvy, helping, appreciation, BF presence, and responsiveness.

Fathers who earn a higher income had a better support provision for breastfeeding than those who had less income. Similarly, the monthly household income of fathers had a significant impact on breastfeeding support provision in Singapore (Regina Ng Wan Leng et al., 2019). A stable income can reduce stress levels in the household, making the breastfeeding journey easier and more supported.

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Implications to practice

The strong reliability of the PBIS-AO scale implies that the scale has some cultural relevance in one of Ethiopia's widely spoken languages, Afaan Oromo. Moreover, the association between partner breastfeeding support and sociodemographic characteristics has significant implications for patient care. Healthcare providers can deliver targeted education and counseling programs for fathers, focusing on the importance of breastfeeding and how they can support their partners. These programs can be tailored based on the specific sociodemographic characteristics influencing support levels.

Healthcare providers can also advocate for and implement inclusive prenatal and postnatal care practices that actively involve husbands/partners from diverse backgrounds. This includes inviting them to prenatal and postnatal visits, offering couple-based education sessions, and discussing the role of partner support in breastfeeding success by understanding the sociodemographic factors at play. In general, the validated tool can play a key role in evidence-based practice by providing healthcare professionals with reliable instruments to assess patient outcomes, evaluate interventions, and make informed decisions on breastfeeding practice.

Strength of the study

In this study, the Partner Breastfeeding Influence Scale was validated for the first time in the Afaan Oromo language in Ethiopia. The study followed the standard forward and backward tool translation process while ensuring an adequate sample size, resulting in a very good reliability coefficient and stability.

Limitations of the study

Although the study has strengths, it also has limitations. The psychometric properties of the scale may not apply to the non-Afaan Oromo-speaking population. Therefore, additional scale validation may be necessary for other commonly used languages in Ethiopia. The lack of a confirmatory factor analysis may limit the robustness of the findings presented in this study. Although there was a high response rate, the 3% non-response due to incomplete answers should be taken into account when using the data, as fathers, often the family's breadwinners tended to leave the interview early for work.

Conclusion

The PBIS-AO has demonstrated excellent reliability and validity in measuring the perceived partner support on breastfeeding practices among Ethiopian fathers whose children were breastfeeding at the time of the study. It is an appropriate tool for healthcare service providers and researchers to examine the support provided on breastfeeding. Moreover, the Exploratory Factor Analysis of the scale has provided valuable insights into the potential dimensions of the scale in the Ethiopian setting. However, future researchers are recommended to undertake confirmatory factor analysis to test the factor structure identified in this study rigorously. Furthermore, conducting other validity measures such as discriminant validity and convergent validity are recommended for comprehensive evaluation of the scale.

List of abbreviations

BF: Breastfeeding; CVI: Content Validity Index; ICC: Intraclass Correlation Coefficient; KMO: Kaiser–Meyer–Olkin test; PBIS-AO: Partner Breastfeeding Influence Scale Afaan Oromo version

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CRediT author statement

Reta Tsegaye Gayesa: Conceptualization, Data curation, Methodology, Formal analysis, Writing original draft. **Fei Wan Ngai**: Methodology, Writing-review and editing, Supervision: **Yao Jie Xie**: Methodology, Writing-review and editing, Supervision

Declaration of competing interest

The authors have declared that no competing interests exist.

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Declaration of interests

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☐ The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: