Level of Anxiety and Knowledge About Breastfeeding in First-Time Mothers with Children Under Six Months

Frank Valverde-De La Cruz[1], Maria Valverde-Ccerhuayo[2], Ana Huamani-Huaracca[3], Gina León-Untiveros[4], Sebastián Ramos-Cosi[5], Alicia Alva-Mantari[6]*

Programa De Estudios De Enfermería, Universidad De Ciencias y Humanidades, Lima, Peru[1, 2]
E-Health Research Center, Faculty of Health Sciences, Universidad De Ciencias y Humanidades, Lima, Peru[3]
Universidad Peruana Del Centro, Huancayo, Peru[4]
Image Processing Research Laboratory (INTI-Lab), Universidad De Ciencias Y Humanidades, Lima, Peru[5, 6]

***Abstract*—The World Health Organization notes that one in five women of reproductive age faces episodes of anxiety. In Latin America, more than 50% of women experience postnatal anxiety, and in Peru, in Huánuco, 40% of first-time mothers have moderate anxiety. The aim of this study is to analyze the relationship between the level of anxiety and knowledge about breastfeeding in first-time mothers with children under six months of age. The study has a correlational quantitative approach, in which STAI questionnaires and the Breastfeeding Knowledge Instrument were applied to a total of 166 mothers, using SPSS and the multinomial logistic regression model. The results indicate that 57.23% of the mothers are young, 53.01% have completed secondary school, 22.89% study, and 63.25% had a normal delivery, with 41.57% experiencing complications. In addition, 56.16% of the children were between 4 and 5 months old. Also, 24.10% of mothers with moderate state anxiety and medium knowledge about breastfeeding and 22.29% with moderate trait anxiety. It was found that complications during childbirth (p=0.026, OR=1.025753) and the mother's occupation (p=0.013, OR=1.149548) are significantly related to anxiety. It is concluded that, although anxiety does not directly affect knowledge about breastfeeding, it is crucial to offer specific psychological and educational support for new mothers, particularly addressing sociodemographic factors.**

***Keywords*—Anxiety; knowledge; breastfeeding; first-time mothers; children**

I. Introduction

The World Health Organization (WHO) indicates that one in five women of reproductive age faces episodes of anxiety, which, if not treated in a timely manner, can evolve into depressive symptoms in 13% of mothers during the postpartum period [1], [2]. Likewise, the Communication Organ of the General Council of Official Colleges of Psychologists (INFOCOP) reports that more than 30% of women who have given birth do not receive postnatal counseling in the first days, a critical period in which the lack of support can trigger significant psychological alterations [3].

Emotional disorders and anxiety during the perinatal period are a global challenge for mental health [4]. In Serbia, about 40% of women who experience their first birth develop postpartum anxiety, evidencing the vulnerability associated with this stage [5]. Similarly, in Spain, motherhood has been reported to have a significant impact on psychological well- being, with 61% of first-time mothers manifesting symptoms of moderate anxiety [6]. These data highlight the urgent need to strengthen psychological support during this critical period to protect maternal mental health.

In Latin America, more than 50% of women experience postnatal anxiety, and 37.1% of them develop symptoms of depression, evidencing the high prevalence of this problem in the process of adaptation to the maternal role [7]. These figures highlight that postnatal anxiety is one of the most significant challenges in maternal mental health. Studies underscore the importance of prioritizing psychological care during this stage, as emotional disorders not only affect mothers' well-being, but also negatively impact the family environment and the development of healthy bonds [8].

In Peru, anxiety is recognized as a common emotional response in first-time mothers, linked to factors such as alterations in sleep patterns and an unbalanced diet [9]. In Huánuco, 40% of first-time mothers have moderate anxiety, while in Cusco this figure rises to 63.3% in women with premature newborns [10]. These figures reflect the importance of addressing maternal mental health, considering regional differences and specific factors that increase vulnerability at this critical stage, in order to prevent negative impacts on both the mother and her environment.

Anxiety is an emotional response characterized by intense feelings of fear and worry in the face of situations perceived as threatening [11]. It is classified into two main types: state anxiety, which is transitory and occurs as a reaction to specific stimuli, generating tension or restlessness that disappears once the triggering factor is eliminated; and trait anxiety, which is a persistent characteristic of personality [12]. The latter predisposes to perceive a wide range of situations as threatening, even if they do not represent a real danger, increasing the frequency and intensity of episodes of state anxiety.

Symptoms of anxiety include difficulty making decisions, tension, general malaise, sleep disturbances, fear, and even nausea [13]. These manifestations are usually associated with

factors such as physical overload, nervous system alterations, chronic diseases and substance use [14]. In women facing motherhood for the first time, the diagnosis is made through a detailed clinical interview. This process assesses the specific symptoms of anxiety, its duration, and the impact on daily life, such as the ability to provide breast milk and adequately attend to the needs of the newborn [15].

On the other hand, mothers face the responsibility of promoting breastfeeding, considered a fundamental pillar in the nutrition of newborns. However, the United Nations Children's Fund (UNICEF) reports that 50% of newborns do not receive breast milk during the first hour of life [16]. This delay not only affects the baby's initial nutrition, but also delays the establishment of maternal bonding, a crucial aspect that is strengthened through the act of breastfeeding, with important benefits for both mother and newborn [17].

The ability to provide breast milk depends both on physiological factors, which determine adequate milk production and transfer, and on psychological aspects and the level of maternal knowledge about optimal breastfeeding practices [18]. These include correct breastfeeding techniques and understanding the appropriate periods for feeding the baby [19]. In Mexico, 69% of postpartum women have intermediate knowledge about breastfeeding, although only 30% know the concept of a lactation [20]. In Colombia, 27% of first-time mothers have deficient knowledge about breastfeeding, evidencing the need to strengthen education in this area [21].

In Lima, 80.4% of first-time mothers have intermediate knowledge about breastfeeding, although they have inconsistencies in certain definitions, influenced by factors such as incomplete educational level and early maternal age [22]. However, this problem intensifies in regions such as Tumbes, where the Demographic and Family Health Survey (ENDES) revealed that only 46.8% of mothers support breastfeeding [23]. This situation compromises children's health, by restricting access to an essential food for growth and development, increasing the risk of nutritional deficiencies and diseases in early stages of life.

The WHO defines breastfeeding as an essential and irreplaceable process to provide infants with the nutrients necessary for optimal development [24]. In addition to strengthening the immune system and reducing the risk of disease in the baby, it offers benefits to the mother, favoring her postpartum recovery and decreasing the incidence of long-term conditions [25]. Exclusive breastfeeding is recommended for the first six months of life, followed by adequate complementary feeding. Nutritional deficiency at this critical stage can increase vulnerability to disease, malnutrition, and chronic conditions [26], [19].

Studies on breastfeeding anxiety and knowledge present significant gaps that justify the need for complementary research, especially in the educational field. Furthermore, it is crucial to conduct studies that consider contextual variables, such as family support and birth complications. This highlights the importance of an integrative approach that analyzes how maternal breastfeeding knowledge, anxiety levels, and sociodemographic conditions interact to influence maternal and child well-being.

The aforementioned factors show the importance of assessing the relationship between the level of anxiety and knowledge about breastfeeding in a specific context. Based on this, it is hypothesized that anxiety in first-time mothers significantly influences their knowledge about breastfeeding, affecting their ability to assume this essential responsibility. This condition could hinder the acquisition and retention of key information about breastfeeding, compromising its proper implementation. In this sense, the present study aims to analyze the relationship between the level of anxiety and knowledge about breastfeeding in first-time mothers with children under six months.

II. Related Works

Gancedo, et al. [27] conducted a study to analyze the factors associated with the level of anxiety and knowledge about childcare and breastfeeding in first-time pregnant women, exploring the related clinical and demographic variables. They used a cross-sectional quantitative design with the Trait State Anxiety Inventory (STAI) questionnaire complemented with questions on sociodemographic data, childcare and breastfeeding in a sample of 104 pregnant women. The results showed that the average age was 34.2 years, 23.1% had a psychopathological history, 61.5% were university students, 17.3% smoked during pregnancy and 88.4% planned to breastfeed. The mean STAI was 18.1, being significantly higher in pregnant women who smoked and had a history of psychopathology. In addition, the relationship between knowledge and anxious profile was linked to being a foreigner and a university student. The authors concluded that pregnant women who smoked, had a history of psychopathology, or did not plan to breastfeed had greater anxiety.

Prieto, et al [28] conducted research with the aim of analyzing the relationship between gestational anxiety, psychological development, and reactivity of the hypothalamic- pituitary-adrenal (HPA) axis in infants aged 2 to 3 months. To do this, they carried out a longitudinal quantitative study with the participation of 141 first-time mothers in their third trimester of gestation, to whom the State-Trait Anxiety Inventory (STAI) was applied, consisting of 40 questions on different aspects of anxiety. In addition, saliva samples were taken from the infants to measure cortisol levels as a marker of stress. The results showed that the average age of the pregnant women was 32.9 years and that mothers with prenatal anxiety had a positive correlation with other psychopathological symptoms, such as interpersonal sensitivity and obsessive- compulsive syndrome. The authors underscored the need to continue exploring this field to develop effective psychological interventions that protect mental health during pregnancy.

Ali [29] in his systematic review, examined the experiences of women with postpartum anxiety disorders, including generalized anxiety disorder (GAD), panic disorder (PD), obsessive-compulsive disorder (OCD), and post-traumatic stress disorder (PTSD). The study used a quantitative methodology and collected information from recognized databases such as MEDLINE and PsycINFO. Of the 44 articles selected, the results indicated that most women suffered from more than one anxiety disorder, frequently associated with

postpartum depression. In addition, these disorders were shown to have negative effects on child upbringing and development. The authors stressed that research in this area remains limited, which prevents definitive conclusions from being drawn. They underscored the need for further studies to broaden understanding of this topic and generate effective interventions that mitigate the impact of postpartum anxiety disorders on mothers and their children.

Álvarez, et al [22] conducted a study whose objective was to determine the level of knowledge about breastfeeding in first-time mothers. This study, with a quantitative and cross-, sectional approach, used a questionnaire validated by the authors, applied to 276 first-time mothers. The results showed that 80.4% of the participants had regular knowledge about breastfeeding, while 47.82% of the mothers under 23 years of age had deficient knowledge. In addition, it was observed that 73.91% of the mothers with low knowledge were from the provinces, establishing a positive correlation between the mother's origin and her level of knowledge. The authors concluded that, although knowledge about breastfeeding is predominantly average, this does not guarantee its adequate application in practice. Therefore, they highlighted the importance of conducting additional research to better understand this problem and design more effective educational strategies to improve the practice of breastfeeding.

Nath, et al [30] analyzed the relationship between prenatal maternal anxiety disorders and the quality of the mother-child bond in the postpartum period. They used a longitudinal design with structured clinical interviews with 454 pregnant women, following them during pregnancy and after delivery. The Edinburgh Postnatal Depression Scale was applied at the beginning and middle of pregnancy, and after childbirth the Postpartum Linkage Questionnaire was used. In addition, mother-child interaction was assessed in 204 mothers through video recordings. The results indicated that gestational anxiety was significantly associated with a negative perception of the mother-child bond, although this association was not observed in the recorded interactions. The authors concluded that maternal anxiety disorders should be addressed before or during gestation to prevent problems that could affect the well-being of both mother and child in the postpartum period.

III. Materials and Methods

A. Research Approach and Design

The present study is quantitative in which numerical resources are used, with a descriptive approach based on the variables, cross-sectional because a single intervention is carried out and correlational to determine the relationship between the level of anxiety and knowledge about breastfeeding in first-time mothers with children under six months. This approach allows for data collection and analysis, facilitating a deep understanding of trends related to both variables [31], [32].

B. Population, Sample and Sampling

The study population is made up of first-time mothers with children under six months of age, registered at the National Maternal Perinatal Institute, the Laura Rodríguez Dulanto Duksil Maternal and Child Center and the Luis Felipe De Las Casas Health Center, located in Lima. From the data collected in visits to these institutions, a total population of 389 first-time mothers were identified.

To determine the sample, the statistical software EPIDAT 4.2 [33] was used, applying a confidence level of 95%, an expected proportion of 25% and a margin of error of 5%, obtaining a representative sample of 166 first-time mothers with children under six months.

The sampling used was non-probabilistic for convenience, selected based on accessibility to the participants and the availability of time for both the interviewers and the mothers [34]. In addition, the selection of study subjects was carried out considering previously established specific criteria, guaranteeing the relevance and adequacy of the sample in relation to the objectives of the research.

1) Inclusion criteria

- New mothers
- Mothers with children under six months of age.
- Mothers located at the National Maternal Perinatal Institute, Laura Rodríguez Dulanto Duksil Maternal and Child Center or the Luis Felipe De Las Casas Health Center.
- Mothers with the physical and mental capacity to participate in the study.
- Mothers who agree to participate in the study by signing the informed consent.

2) Exclusion Criteria

- Mothers with multiple children.
- Mothers with children six months and older.
- Mothers who do not belong to the selected health centers.
- Mothers with limitations in reading or writing.
- Mothers who refuse to participate in the study verbally or by not signing the informed consent.

C. Study Variable(s)

The present study has, as an independent variable the level of anxiety and as a dependent variable the knowledge about breastfeeding, both variables according to their nature are qualitative with an ordinal measurement scale.

1) Conceptual definition of anxiety level: It is a temporary emotional condition, characterized by the expression of emotions, nervousness and an increase in the activity of the autonomic nervous system. It functions as a warning signal that alerts about the proximity of a potential danger and enables the person to take action to face the threat [35].

2) Operational definition of anxiety level: It is a state of temporary emotional commitment, stimulated by the feeling of danger that occurs in first-time mothers with children under six months of age from the National Maternal Perinatal Institute,

Laura Rodríguez Dulanto Duksil Maternal and Child Center and the Luis Felipe De Las Casas Health Center.

3) Conceptual definition of knowledge about breastfeeding: It is the theoretical and practical concepts about breastfeeding acquired throughout life through experiences, study, observation and interaction with the surrounding environment. It plays a fundamental role in decision-making, problem-solving and adaptation to the environment [36].

4) Operational definition of knowledge about breastfeeding: they are the set of knowledge related to breastfeeding that determine the behaviors of first-time mothers with children under six months of age from the National Maternal Perinatal Institute, Laura Rodríguez Dulanto Duksil Maternal and Child Center and the Luis Felipe De Las Casas Health Center.

D. Measuring Technique and Instrument

The technique used during data collection is the survey, which is widely used in quantitative and descriptive studies [37]. In addition, an instrument was used for each of the variables.

1) Anxiety level: The instrument used to measure this variable is the State-Trait Anxiety Inventory (STAI), which was designed and validated by Charles Spielberger [38] this instrument assesses anxiety with a versatile application, it consists of 40 questions, which are composed of 2 dimensions: Anxiety state, i.e., how one feels at the moment; and Anxiety trait, that is, how one feels in general, uses a 4-point Likert-type scale (from 0 to 3 points). On the state anxiety subscale, item scores ranged from 0 = not at all, 1 = somewhat, 2 = moderately, and 3 = a lot. On the trait anxiety subscale, response options range from 0 = almost never, 1 = sometimes, 2 = often, and 3 = almost always.

For the national context, the validation process of the instrument was carried out through an expert judgment composed of five judges experienced in the thematic area, who issued a rating based on the criteria of relevance, coherence and clarity. Once the answers of the judges were obtained, the validity was calculated with Aiken's V where the values of V close to 1 indicate a perfect agreement of the judges. Finally, the total value of V of Aiken was 0.98, which means that there is a favorable agreement among the judges, which is why the proposed instrument is accepted as valid. In addition, reliability was calculated through a pilot test that included 30 participants, with these data Cronbach's Alpha coefficient was applied to determine the reliability of the questionnaire giving a value of 0.91, which positions it as reliable.

2) Breastfeeding knowledge: The questionnaire for the analysis of this variable is called the Breastfeeding Knowledge Instrument developed by Meléndez [39], which measures the level of knowledge about breastfeeding in first-time mothers. This instrument consists of a questionnaire that addresses characteristics of breast milk, benefits of breastfeeding, breastfeeding techniques and practices related to breastfeeding. The questionnaire contains 14 questions that are divided into two dimensions: knowledge about breastfeeding and exclusive breastfeeding practice in mothers. Each item is scored from 0 to 1, and a good knowledge score of 10 to 14 points is established, fair 5 to 9 points, bad 0 to 4 points. In addition, it is determined whether the practice is adequate 7 to 14 points or inadequate 0 to 6 points.

The validity of the questionnaire was determined by the evaluation of a panel of five experts in breastfeeding and childcare, whose scores allowed the calculation of Aiken's V coefficient, obtaining a value of 0.92, which confirms its validity in the population studied. Likewise, reliability was established through a pilot test applied to 30 participants who met the eligibility criteria. The analysis using Cronbach's alpha coefficient yielded a value of 0.89, indicating a high internal consistency and reliability of the instrument. These results ensure that the questionnaire is an accurate and effective tool to assess breastfeeding knowledge and practices in first-time mothers, providing robust and replicable data in future research.

E. Bioethical Principles

Incorporating ethical considerations into research is essential to ensure the proper treatment and protection of participants. This approach ensures that the rights and well- being of the people involved are respected at every stage of the study.

1) Principle of autonomy: Participants were free to voluntarily decide whether to participate in the study. They were offered to sign or refuse the informed consent, fully respecting any decision made, reflecting a commitment to ensure their autonomy [40].

2) Principle of beneficence: Priority was given to participants having access to reliable and relevant information on anxiety and breastfeeding. This process contributed to the strengthening of their knowledge, promoting their personal benefit and favoring meaningful learning [40].

3) Principle of non-maleficence: Measures were implemented to avoid any risk or harm during the interventions. The information collected was used exclusively for academic purposes, ensuring that it was not exposed or publicly disclosed without the express authorization of the participants [40].

4) Principle of justice: The participants were treated equally, ensuring equal, respectful and cordial treatment. Likewise, it was verified that the questionnaire was applied only to those participants with the time and willingness to collaborate, promoting a fair and participatory environment [40].

F. Previous Coordination

In the first instance, the pertinent cover letter was sent to the administrative area of the National Maternal and Perinatal Institute, Laura Rodríguez Dulanto Duksil Maternal and Child Center and the Luis Felipe De Las Casas Health Center, attaching approval by the Ethics Committee of the University of Sciences and Humanities, an entity that rigorously evaluates research projects. Through this documentation, the process was carried out to obtain the authorization of the directors and main doctors of the aforementioned health centers, located in Lima.

G. Data Collection

With the approval of the authorities, the enumerators were able to approach the facilities of the health centers to identify the mothers who meet the criteria indicated and apply the instruments. First, participants were informed about the purpose of the study and informed consent was given, then the confidentiality of their information was ensured and the questionnaire was delivered in a quiet and distraction-free environment. Clear instructions on how to complete the questionnaire were then provided, questionnaires were collected once participants had finished and questionnaires were quickly reviewed to ensure there are no missed responses, the nature of both variables was explained, and educational guidance was provided to reinforce maternal and child care.

H. Statistical Analysis

The statistical analysis began with the conversion of the collected data to a numerical format for the construction of a matrix that would maintain the order and meaning of the information. This matrix was then translated into Microsoft Excel, which facilitated a preliminary count and initial analysis. Finally, the data were processed using the IBM SPSS Statistics v.25 software, where percentages, absolute and relative frequencies, measures of central tendency and standard deviation were calculated, aligned with the general objective of the study [41].

5) Multinomial logistic regression model: It is a statistical technique used to analyze the relationship between a categorical dependent variable with more than two categories and a set of predictor variables. This model allows estimating the probability of belonging to each category, taking one as a reference. It is based on the calculation of probability ratios OR (odds ratios) and adjusts coefficients by means of maximum likelihood [42].

IV. Results

A. Sociodemographic Characteristics

Table I shows the sociodemographic data of the mothers who participated in the study, which shows that 8.34% (14) of the mothers are adolescents, 57.23% (95) are young people and 34.34% (57) are adults. Regarding the level of education, 9.04% (15) have incomplete primary or secondary education, 53.01% (88) have completed secondary school, 24.10% (40) are pursuing a technical career, 1.20% (2) have completed a technical career, 11.45% (19) have an incomplete university level and 1.20% (2) have completed university studies. In terms of occupation, 16.27% (27) are housewives, 22.89% (38) are students, 38.55% (64) work and 22.29% (37) study and work. On the other hand, in terms of marital status, 39.76% (66) are single, 49.40% (82) are cohabiting, and 10.84% (18) are married. As for the origin, 80.12% (133) are from Lima, 18.67% (31) are from the province and 1.20% (2) are from abroad. Regarding the type of delivery, 63.25% (105) had a natural birth and 36.75% (61) had a cesarean delivery. Regarding complications in childbirth, 41.57% (69) reported complications and 58.43% (97) had no complications. Regarding the age of the child, 28.31% (47) is from 0 to 1 month, 35.54% (59) is from 2 to 3 months and 56.16% (60) is from 4 to 5 months. Finally, regarding the sex of the child, 62.05% (103) is male and 37.95% (63) is female.

TABLE I Sociodemographic Characteristics of First-Time Mothers with Children under Six Months of Age in Lima

Sociodemographic characteristics	n=166	
	fi	%
Age		
Adolescent	14	8.43
Young	95	57.23
Adult	57	34.34
Level of education		
Secondary and/or Primary Incomplete	15	9.04
Complete Secondary School	88	53.01
Ongoing Technician	40	24.10
Complete Technician	2	1.20
Incomplete University	19	11.45
Complete University	2	1.20
Occupation		
Housewife	27	16.27
Studies	38	22.89
Works	64	38.55
Study and work	37	22.29
Marital status		
Single	66	39.76
Cohabitant	82	49.40
Married woman	18	10.84
Origin		
File	133	80.12
Province	31	18.67
Foreigner	2	1.20
Type of delivery		
Normal delivery	105	63.25
Cesarean delivery	61	36.75
Complications in childbirth		
Yes	69	41.57
No	97	58.43
Age of the child		
0 to 1 month	47	28.31
2 to 3 months	59	35.54
4 to 5 months	60	56.16
Sex of the child		
Male	103	62.05
Female	63	37.95

B. Breastfeeding Knowledge

Fig. 1 shows the distribution of the level of knowledge about breastfeeding in first-time mothers with children under six months of age. The results reveal that 13.86% (23) of the participants have a good knowledge about breastfeeding, while the majority, equivalent to 71.08% (118), show a regular level of knowledge. On the other hand, 15.06% (25) of the mothers evaluated have poor knowledge in this area.

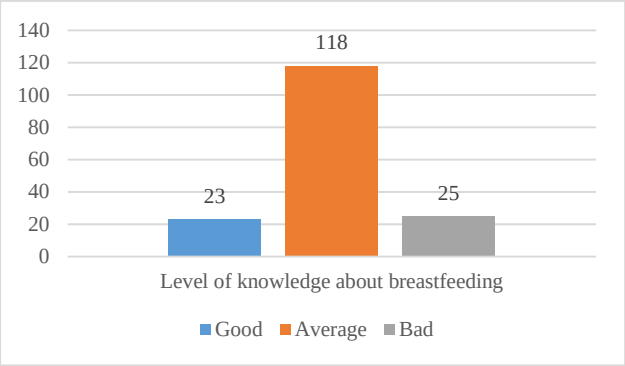

Fig. 1. Level of knowledge about breastfeeding.

C. Anxiety, Status and Knowledge about Breastfeeding According to Sociodemographic Characteristics

Fig. 2 shows the distribution of the level of state anxiety and knowledge about breastfeeding according to the age of the mothers, grouped into adolescents, young people and adults. It can be identified that the group of adolescents with state anxiety is made up of 14 mothers, which represents 8.43% (0.60% (1) with low state anxiety and medium knowledge, 1.205% (2) with moderate anxiety and low knowledge, 5.42% (9) with moderate anxiety and medium knowledge, 1.205% (2) with moderate anxiety and good knowledge). The group of young people with state anxiety is composed of 95 mothers or 57.23% (1.81% (3) with low anxiety and bad knowledge, 6.02% (10) with low anxiety and medium knowledge, 2.41% (4) with low anxiety and good knowledge, 5.42% (9) with moderate anxiety and bad knowledge, 24.10% (40) with moderate anxiety and medium knowledge, 6.02% (10) with moderate anxiety and good knowledge, 1.205% (2) with high anxiety and bad knowledge, 8.43% (14) with high anxiety and medium knowledge, 1.81% (3) with high anxiety and good knowledge). In the group of adults with state anxiety, 57 mothers or 34.34% (1.81% (3) with low anxiety and bad knowledge, 3.01% (5) with low anxiety and medium knowledge, 0.60% (1) with low anxiety and good knowledge, 1.205% (2) with moderate anxiety and bad knowledge, 15.66% (26) with moderate anxiety and medium knowledge, 1.81% (3) with moderate anxiety and good knowledge, 2.41% (4) with high anxiety and poor knowledge, 7.83% (13) with high anxiety and medium knowledge).

Table II presents the distribution of anxiety, status, and knowledge about breastfeeding according to the participants' occupation. In the group of housewives, 1.81% (3) have low state anxiety, with 2 people with bad knowledge and 1 regular. 9.64% (16) had moderate anxiety, with 5 people having bad knowledge, 10 regular and 1 good. 4.82% (8) had high anxiety, with 7 people with regular knowledge and 1 good. In the group of mothers who study, 4.22% (7) have low anxiety, with 5 people with regular knowledge and 2 with good knowledge. 12.65% (21) had moderate anxiety, with 1 person having bad knowledge, 16 regular and 4 good. 6.02% (10) had high anxiety, with 1 person with poor knowledge, 8 regular and 1 good. In working mothers, 5.42% (9) have low anxiety, with 1 person having bad knowledge, 6 fair and 2 good. 25.90% (43) had moderate anxiety, with 5 people with poor knowledge, 32 regular and 6 good. 7.23% (12) had high anxiety, with 5 people having poor knowledge and 7 having regular knowledge. Mothers who study and work with low anxiety constitute 4.82% (8), with 3 people with bad knowledge, 4 fair and 1 good. 13.86% (23) had moderate anxiety, with 2 people with poor knowledge, 17 regular and 4 good. 3.61% (6) had high anxiety, with 5 people with regular knowledge and 1 good one.

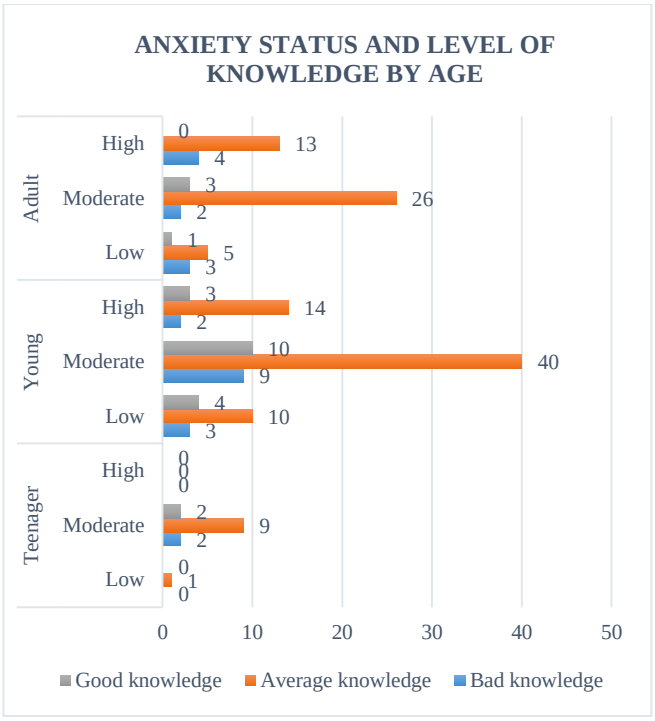

Fig. 2. Level of anxiety, status and knowledge about breastfeeding by age.

TABLE II ANXIETY, STATE AND KNOWLEDGE ABOUT BREASTFEEDING BY OCCUPATION

Occupation	State anxiety	Level of knowledge				
		Bad boy	Regular	Well	fi	%
Housewife	Casualty	2	1	0	3	1.81
	Moderate	5	10	1	16	9.64
	Loud	0	7	1	8	4.82
Studies	Casualty	0	5	2	7	4.22
	Moderate	1	16	4	21	12.65
	Loud	1	8	1	10	6.02
Works	Casualty	1	6	2	9	5.42
	Moderate	5	32	6	43	25.90
	Loud	5	7	0	12	7.23
Study and work	Casualty	3	4	1	8	4.82
	Moderate	2	17	4	23	13.86
	Loud	0	5	1	6	3.61
Total		25	118	23	166	100

D. Trait Anxiety and Knowledge about Breastfeeding According to Sociodemographic Characteristics

Fig. 3 shows the distribution of the level of trait anxiety and knowledge about breastfeeding by age groups. It can be identified that the group of adolescents with trait anxiety is made up of 14 mothers, which represents 8.43% (0.60% (1) with moderate anxiety and bad knowledge, 5.42% (9) with moderate anxiety and medium knowledge, 0.60% (1) with moderate anxiety and good knowledge, 0.60% (1) with high anxiety and bad knowledge, 0.60% (1) with high anxiety and medium knowledge, 0.60% (1) with high anxiety and good knowledge). The group of young people with trait anxiety is composed of 95 mothers or 57.23% (2.41% (4) with low anxiety and medium knowledge, 5.42% with moderate anxiety and poor knowledge, 22.29% (37) with moderate anxiety and medium knowledge, 7.23% (12) with moderate anxiety and good knowledge, 3.01% (5) with high anxiety and bad knowledge, 13.86% (23) with high anxiety and medium knowledge, 3.01% (5) with high anxiety and good knowledge). In the group of adults with trait anxiety, 57 mothers or 34.34% (1.205% (2) with low anxiety and bad knowledge, 2.41% (4) with low anxiety and medium knowledge, 1.205% (2) with moderate anxiety and bad knowledge, 12.04% (20) with moderate anxiety and medium knowledge, 1.81% (3) with moderate anxiety and good knowledge, 3.01% (5) with high anxiety and bad knowledge, 12.04% (20) with high anxiety and medium knowledge, 0.60% (1) with high anxiety and good knowledge).

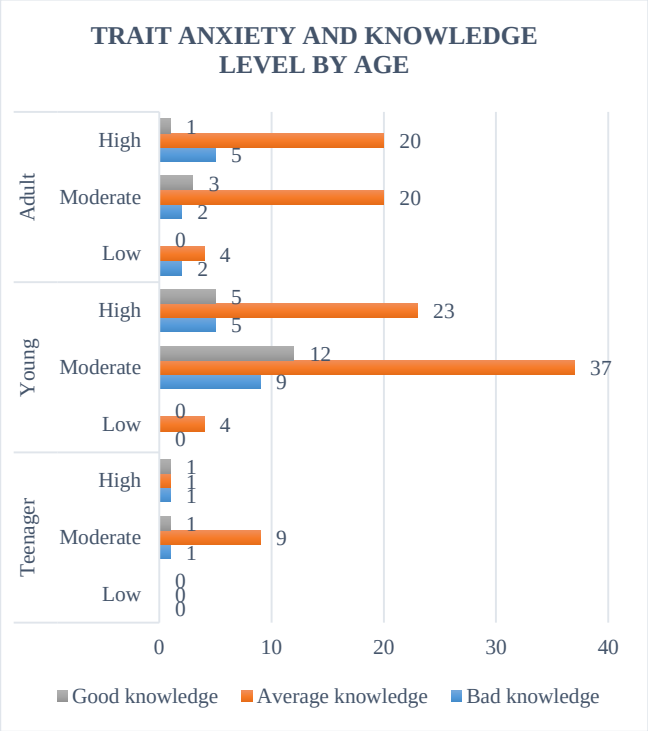

Fig. 3. Level of anxiety trait and knowledge about breastfeeding by age.

Table III presents the distribution of trait anxiety and knowledge about breastfeeding according to the participants' occupation. In the group of housewives, 0.60% (1) have low trait anxiety, with 1 person having poor knowledge. 5.42% (9) had moderate anxiety, with 2 people with bad knowledge, 6 fair and 1 good. 10.24% (17) had high anxiety, with 4 people with bad knowledge, 12 regular and 1 good. In the group of mothers who studied, 0.60% (1) had low anxiety, with 1 person with regular knowledge. 14.46% (24) had moderate anxiety, with 1 person having bad knowledge, 17 regular and 6 good. 7.83% (13) had high anxiety, with 1 person having bad knowledge, 11 regular and 1 good. In working mothers, 3.61% (6) have low anxiety, with 1 person having poor knowledge and 5 having regular knowledge. 22.89% (38) had moderate anxiety, with 5 people with poor knowledge, 28 regular and 5 good. 12.05% (20) had high anxiety, with 5 people having bad knowledge, 12 regular and 3 good. Mothers who study and work with low anxiety constitute 1.21% (2), with people with 2 people with regular knowledge. 13.86% (23) had moderate anxiety, with 4 people with poor knowledge, 15 regular and 4 good. 7.23% (12) had high anxiety, with 1 person with bad knowledge, 9 regular and 2 good.

TABLE III TRAIT ANXIETY AND KNOWLEDGE ABOUT BREASTFEEDING BY OCCUPATION

Occupation	Trait anxiety	Level of knowledge				
		Bad boy	Regular	Well	fi	%
Housewife	Casualty	1	0	0	1	0.60
	Moderate	2	6	1	9	5.42
	Loud	4	12	1	17	10.24
Studies	Casualty	0	1	0	1	0.60
	Moderate	1	17	6	24	14.46
	Loud	1	11	1	13	7.83
Works	Casualty	1	5	0	6	3.61
	Moderate	5	28	5	38	22.89
	Loud	5	12	3	20	12.05
Study and work	Casualty	0	2	0	2	1.21
	Moderate	4	15	4	23	13.86
	Loud	1	9	2	12	7.23
Total		25	118	23	166	100

E. Multinomial Logistic Regression Model

The established model was applied to detect whether the level of anxiety in mothers influences the level of knowledge about breastfeeding or vice versa, in addition to the relevance of sociodemographic data. In this process, an association of these variables has been found for both state anxiety and trait anxiety.

6) Anxiety state: It has been identified that the predominant factors affecting state anxiety are sociodemographic in nature. This process can be described through the following formula:

$$AE = 1.03 - 0.828(x1) - 0.149(x2) + 0.2148657(x3)$$

where:

AE: State Anxiety

x1: Occupation

x2: Provenance

x3: Complications

Through this calculation, it can be concluded that the Multinomial Logistic Regression Model is adequate, since it presents at least a significant positive value, which is detailed in the following table.

TABLE IV REGRESSION MODEL FOR STATE ANXIETY BASED ON SOCIODEMOGRAPHIC DATA

Sociodemographic data	Anxiety State
	P value (< 0.05)
Occupation	0.083
Origin	0.167
Complications	0.026

Table IV presents the relationship between the sociodemographic data analyzed in the statistical model and the mothers' state anxiety. It can be detected that the p-value of significance is greater than 0.05 in the variables, with the exception of complications in childbirth p = 0.026, which statistically evidences those complications in childbirth are associated with having state anxiety.

TABLE V ANXIETY STATUS AND COMPLICATIONS IN CHILDBIRTH

Complications in childbirth	Anxiety State
	Odds Ratio (OR > 1)
YES	1.025753
NO	0.274951

Table V presents the relationship between complications in childbirth and state anxiety. It can be detected that the Odds Ratio is greater than unity in mothers who HAVE had complications in childbirth with an OR of 1.025753, which means that statistically mothers who have presented complications in childbirth are likely to have state anxiety.

7) Trait anxiety: In relation to trait anxiety, sociodemographic factors have been identified that significantly influence its manifestation. This process can be described by the following formula:

$$AR = 1.23501 - 0.1120824(x1) + 0.1674339(x2)$$

where:

AR: Trait Anxiety

x1: Occupation

x3: Complications

Through this calculation, it can be stated that the Multinomial Logistic Regression Model is acceptable, since it has at least one positive value of significance, which is detailed in the table below.

TABLE VI REGRESSION MODEL FOR TRAIT ANXIETY BASED ON SOCIODEMOGRAPHIC DATA

Sociodemographic data	Trait Anxiety
	P value (< 0.05)
Occupation	0.013
Complications	0.066

Table VI presents the relationship between the sociodemographic data analyzed in the statistical model and maternal trait anxiety. It can be detected that the p-value of significance is less than 0.05 in occupation with a p-value = 0.013, which statistically evidences that the mothers' occupation is associated with having trait anxiety.

TABLE VII TRAIT ANXIETY AND OCCUPATION

Occupation	Trait Anxiety
	OR (Odds Ratio > 1)
Housewife	0.8416789
Studies	1.149548
Works	0.3544152
Study and work	0.7960873

Table VII presents the relationship between mothers' occupation and trait anxiety. It can be detected that the Odds Ratio is less than one unit in the variables, with the exception of the mothers who study, since in them there is an OR of 1.149548, which means that statistically the mothers who study have a higher probability of having trait anxiety.

V. DISCUSSION

This study evaluated 166 first-time mothers with children under six months, with the aim of analyzing the relationship between the level of anxiety and knowledge about breastfeeding. The results did not show a significant influence of anxiety on breastfeeding knowledge, which led to the rejection of the initial hypothesis. However, relevant data were found that suggest a relationship between the level of anxiety and the sociodemographic characteristics of the mothers, which opens new lines of research to explore these factors in depth.

In this sense, it was estimated that 57.23% of first-time mothers are between 18 and 26 years old, which classifies them as young according to the WHO [43]. However, this data contrasts with the findings of [27], which reported a mean age of 34.2 years, and with [28], where the average age was 32.9 years, classifying the mothers as adults. This difference could be linked to the high incidence of teenage pregnancies in Peru, a phenomenon that, although it has decreased in recent years, is still significantly higher than in other countries [44].

Regarding the educational level of the mothers, 53.01% have completed secondary school, which coincides with the predominant age group in this study, since youth is usually linked to higher education, as indicated in [27], where 61.5% of the mothers had university studies. However, in our study, only 22.89% of the mothers indicated studying as an occupation, while 38.55% worked, which could reflect the need for economic income faced by young mothers within the social and economic context of Peru.

It was observed that 63.25% of the mothers had a normal delivery; however, of the total number of mothers with normal delivery and cesarean section, 41.57% experienced complications, which shows that normal delivery does not guarantee the absence of complications. In addition, 56.16% of the children were between 4 and 5 months old, a crucial stage in which children require exclusive care and reinforcement of breastfeeding to prevent problems such as anemia. These situations generate psychological distress in mothers, especially if they are first-time mothers, and as pointed out [30], maternal

anxiety disorders must be addressed before or during pregnancy to prevent negative impacts on the well-being of the mother and child.

The analysis of breastfeeding knowledge in first-time mothers showed that 71.08% of mothers with children under six months of age have regular knowledge about breastfeeding, which coincides with the findings of [22], where 80.4% of mothers also had regular knowledge. This reflects the predominance of basic or insufficient knowledge of breastfeeding among mothers, which highlights the need to reinforce this knowledge through support programs that promote a better understanding and practice of breastfeeding in the early stage of motherhood.

On the other hand, the study revealed that all mothers have levels of anxiety, both state and trait, although in different intensities. This finding is justified by the significant changes that motherhood implies in women's emotional and psychological lives. Motherhood can trigger both adaptive and stress responses, raising anxiety levels, especially in those with a greater genetic or historical predisposition to experience it. This situation affects the motherhood process, as evidenced in [29], who pointed out that anxiety has negative effects on child upbringing and development.

In mothers with state anxiety, it is identified that 24.10% are young people with moderate state anxiety and medium knowledge about breastfeeding. In addition, 25.90% (43) of mothers with this type of anxiety work and of these 32 have regular knowledge. As for mothers with trait anxiety, 22.29% are young people with moderate trait anxiety and medium knowledge about breastfeeding. Likewise, 22.89% (38) of these mother's work, and 28 of them have regular knowledge. These findings suggest that there is a relationship between anxiety, maternal age, knowledge about breastfeeding and occupation, since these factors can generate tension that decreases when stressors are resolved, although anxiety can persist in the long term.

In relation to the logistic regression model, it has been shown to be adequate for analyzing state anxiety, since complications during childbirth show a statistically significant relationship with state anxiety, evidenced by a p-value of 0.026. This finding is reinforced by the individual analysis of complications in childbirth, where an OR of 1.025753 indicated that mothers who experienced complications have a higher chance of developing state anxiety. This result can be explained by the fact that complications in childbirth pose a threat to both mother and child, acting as a strong stimulus for episodes of anxiety.

The regression model for trait anxiety has also proven to be adequate, as a statistically significant relationship was found between the mother's occupation and trait anxiety, with a p- value of 0.013. This result is reinforced by the individual analysis of the type of occupation, in which an OR of 1.149548 showed that mothers who study are more likely to present trait anxiety. This may be explained by the fact that trait anxiety persists over time, possibly caused by academic stresses, which persist into motherhood.

VI. Conclusion

This study sought to analyze the relationship between the level of anxiety and knowledge about breastfeeding in first-time mothers with children under six months. However, no conclusive results were found to support a significant correlation between the two variables. Consequently, the relationship between anxiety and sociodemographic factors was further explored. The absence of a positive correlation between anxiety and breastfeeding knowledge suggests that, although anxiety does not necessarily inhibit learning, there is scope to improve knowledge through intervention strategies.

The results of the study indicate that the experience of motherhood, especially for first-time mothers, presents significant emotional challenges that need to be properly identified and supported. Therefore, the implementation of accessible psychological support programs becomes essential, encompassing both individual and group activities, stress management techniques, and peer support groups. These programs must be adapted to the diverse circumstances of the mothers, taking into account factors such as age, history of complications in childbirth, occupation and educational level. In addition, it is crucial that these interventions are culturally sensitive and adapted to the social and cultural reality of Peru.

A holistic approach that strengthens both the mother's knowledge of breastfeeding and the motherhood process would not only improve the emotional well-being of new mothers, but would also have a positive impact on the health and optimal development of babies under six months of age. To address this challenge, it is crucial to provide broader education, access to reliable information, and greater support from health professionals and society at large. This knowledge would benefit not only mothers and their children, but also society, reducing the burden on the health system and increasing awareness of the importance of child nutrition.

Finally, this study opens the door to future longitudinal studies that could examine how anxiety and knowledge levels evolve over time, especially under psychological and educational support programs. In addition, it would be valuable to incorporate additional socio-demographic factors, such as family or partner support, specific economic situation and mothers' previous experiences. These factors could have a significant influence on anxiety and knowledge levels, which would improve the conditions of mothers and enrich understanding in this field of study.

References

[1] World Health Organization, "Anxiety Disorders," Sep 27, 2023. Available at: https://www.who.int/es/news-room/fact-sheets/detail/anxiety-disorders.

[2] World Health Organization, Maternal mental health and child health and development in low and middle income countries, Report of the meeting, Geneva, Switzerland, 30 January - 1 February, 2008. Available at: https://www.who.int/publications/i/item/9789241597142.

[3] General Council of Psychology of Spain, "Motherhood: much more than an emotional revolution," 29-Jun-2016. [Online]. Available at: https://www.infocop.es/la-maternidad-mucho-mas-que-una-revolucion-emocional/.

[4] T. Taiwo et al., "Perinatal Mood and Anxiety Disorder and Reproductive Justice: Examining Unmet Needs for Mental Health and Social Services

in a National Cohort," Health Equity, vol. 8, pp. 76-86, 2024. [Online]. Available at: https://doi.org/10.1089/heq.2022.0207.

[5] J. Hahn-Holbrook et al., "Economic and Health Predictors of National Postpartum Depression Prevalence: A Systematic Review, Meta-analysis, and Meta-Regression of 291 Studies from 56 Countries," Frontiers in Psychiatry, vol. 8, 2018. [Online]. Available at: https://doi.org/10.3389/fpsyt.2017.00248.

[6] E. Arroyo-Borrell et al., "Influence maternal background has on children's mental health," International Journal for Equity in Health, vol. 16, 2017. [Online]. Available at: https://doi.org/10.1186/s12939-017-0559-1.

[7] C. E. Tellería, "Evaluation of the levels of depression, anxiety and psychosocial factors in patients with previous gestational diabetes: Ciudad Hospitalaria Dr. Enrique Tejera. Period 2011-2012," Community and Health, vol. 12, no. 2, pp. 62-72, 2014. [Online]. Available at: https://ve.scielo.org/scielo.php?pid=S1690-32932014000200009&script=sci_abstract.

[8] F. Alptekin et al., "Reducing the stress of mothers in the postpartum period: psychological inflexibility or mother-infant bonding," Journal of Reproductive and Infant Psychology, pp. 1-16, 2024. [Online]. Available at: https://doi.org/10.1080/02646838.2024.2369578.

[9] M. Pomati et al., "Trends and patterns of the double burden of malnutrition (DBM) in Peru: a pooled analysis of 129,159 mother–child dyads," International Journal of Obesity, vol. 45, pp. 609-618, 2021. [Online]. Available at: https://doi.org/10.1038/s41366-020-00725-x.

[10] S. A. Montoya Salis, V. Romero, and L. M. Valencia, "Depression and anxiety in first-time pregnant women attended at health centers in the district of Huánuco - 2015," UNHEVAL Institutional Repository, 2016. [Online]. Available at: https://repositorio.unheval.edu.pe/item/0fcc261c-1e0b-40e1-96a8-d37d8922cd49.

[11] M. Cypryańska et al., "Anxiety as a mediator of relationships between perceptions of the threat of COVID-19 and coping behaviors during the onset of the pandemic in Poland," PLoS ONE, vol. 15, 2020. [Online]. Available at: https://doi.org/10.1371/journal.pone.0241464.

[12] K. A. Knowles et al., "Specificity of trait anxiety in anxiety and depression: Meta-analysis of the State-Trait Anxiety Inventory," Clinical Psychology Review, vol. 82, 2020, Art. No. 101928. [Online]. Available at: https://doi.org/10.1016/j.cpr.2020.101928.

[13] E. P. Terlizzi and M. A. Villarroel, "Symptoms of generalized anxiety disorder among adults: United States, 2019," NCHS Data Brief, no. 378, pp. 1-8, Sep. 2020. [Online]. Available at: https://pubmed.ncbi.nlm.nih.gov/33054928/.

[14] L. Garey, H. Olofsson, T. Garza, A. Rogers, B. Kauffman, and M. Zvolensky, "Directional effects of anxiety and depressive disorders with substance use: a review of recent prospective research," Current Addiction Reports, vol. 7, pp. 344-355, 2020. [Online]. Available at: https://doi.org/10.1007/s40429-020-00321-z.

[15] L. Vismara, L. Rollè, F. Agostini, C. Sechi, V. Fenaroli, S. Molgora, E. Neri, L. Prino, F. Odorisio, A. Trovato, C. Polizzi, P. Brustia, L. Lucarelli, F. Monti, E. Saita, and R. Tambelli, "Perinatal parenting stress, anxiety, and depression outcomes in first-time mothers and fathers: A 3- to 6-months postpartum follow-up study," Frontiers in Psychology, Vol. 7, 2016. [Online]. Available at: https://doi.org/10.3389/fpsyg.2016.00938.

[16] UNICEF, "Worldwide, 77 million newborns do not receive breast milk in their first hour of life, says UNICEF," 29-Jul-2016. [Online]. Available at: https://www.unicef.org/es/comunicados-prensa/en-todo-el-mundo-77-millones-de-reci%C3%A9n-nacidos-no-reciben-leche-materna-en-su.

[17] E. Farah, M. Barger, C. Klima, B. Rossman, and P. Hershberger, "Impaired lactation: Review of delayed lactogenesis and insufficient lactation," Journal of Midwifery & Women's Health, 2021. [Online]. Available at: https://doi.org/10.1111/jmwh.13274.

[18] M. Benedetto, C. Bottanelli, A. Cattaneo, C. Pariante, and A. Borsini, "Nutritional and immunological factors in breast milk: A role in the intergenerational transmission from maternal psychopathology to child development," Brain, Behavior, and Immunity, vol. 85, pp. 57-68, 2020. [Online]. Available at: https://doi.org/10.1016/j.bbi.2019.05.032.

[19] C. P. Olivera, J. R. Olivos, F. A. Menez, J. J. M. Nina, A. Huamani-Huaracca, and A. A. Mantari, "Observational quantitative study of factors associated with noncompliance in growth and development monitoring in children aged 0 to 1 years at the Laura Rodríguez Dulanto Duskil Maternal-Infant Center, Comas, Lima, Peru, 2023," International Journal of Engineering Trends and Technology, vol. 72, no. 5, pp. 355-364, May 2024. [Online]. Available at: https://www.scopus.com/record/display.uri?eid=2-s2.0-85195505547&origin=recordpage.

[20] E. Téllez-Pérez, G. M. Romero-Quechol, and G. M. Galván-Flores, "Knowledge about breastfeeding of puerperal women who attend the first level of care," Revista Enferm IMSS, vol. 27, no. 4, pp. 196-205, 2019. [Online]. Available at: https://www.medigraphic.com/cgi-bin/new/resumen.cgi?IDARTICULO=92840.

[21] Z. B. Bastidas Ortiz and L. C. Alcívar, "Knowledge and practices of breastfeeding in primigestas of the 'José María Velasco Ibarra' hospital," Digital Repository - National University of Loja, 2016. [Online]. Available at: https://dspace.unl.edu.ec/jspui/handle/123456789/9231.

[22] M. D. M. Alvarez Lopez, A. P. Angeles Salcedo, L. R. Pantoja Sanchez, "Knowledge about breastfeeding in first-time mothers. National Maternal Perinatal Institute, Lima 2019," Peruvian Journal of Maternal and Perinatal Research, vol. 9, no. 4, 2020. [Online]. Available at: https://investigacionmaternoperinatal.inmp.gob.pe/index.php/rpinmp/article/view/214.

[23] National Institute of Statistics and Informatics (INEI), "Breastfeeding in the population under six months of age increased from 65.9% to 69.3% between the years 2022 and 2023," 2023. [Online]. Available at: https://m.inei.gob.pe/prensa/noticias/lactancia-materna-en-la-poblacion-menor-de-seis-meses-de-edad-aumento-de-659-a-693-entre-los-anos-2022-y-2023-15172/.

[24] Pan American Health Organization (PAHO), "Breastfeeding and Complementary Feeding," [Online]. Available at: https://www.paho.org/es/temas/lactancia-materna-alimentacion-complementaria.

[25] S. Pajai, S. Gupta, and A. Pawade, "Benefits of breastfeeding on child and postpartum psychological health of the mother," Journal of South Asian Federation of Obstetrics and Gynaecology, 2023. [Online]. Available at: https://doi.org/10.5005/jp-journals-10006-2217.

[26] D. Sharma and R. Kafle, "Exclusive breastfeeding and complementary feeding practices among children in slum of Pokhara," Journal of College of Medical Sciences-Nepal, vol. 16, no. 2, 2020. [Online]. Available at: https://doi.org/10.3126/jcmsn.v16i2.24797.

[27] A. Gancedo-García, P. Fuente-González, M. Chudáčik, A. Fernández-Fernández, P. Suárez-Gil, and V. Suárez-Martínez, "Factors associated with the level of anxiety and knowledge about childcare and breastfeeding of first-time pregnant women," Primary Care, vol. 51, no. 5, pp. 285-293, May 2018. [Online]. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC6839201/.

[28] F. Prieto, J. A. Portellano, and J. A. Martínez-Orgado, "Antenatal maternal anxiety, infant psychological development, and HPA axis reactivity in 2–3-month-old infants," Clínica y Salud, vol. 30, no. 1, pp. 4-12, Mar. 2019. [Online]. Available at: https://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S1130-52742019000100004.

[29] E. Ali, "Women's experiences with postpartum anxiety disorders: a narrative literature review," International Journal of Women's Health, vol. 10, pp. 237-249, May 2018. [Online]. Available at: https://www.tandfonline.com/doi/full/10.2147/IJWH.S158621.

[30] S. Nath, R. Pearson, P. Moran, S. Pawlby, E. Molyneaux, F. Challacombe, and L. Howard, "The association between prenatal maternal anxiety disorders and postpartum perceived and observed mother-infant relationship quality," Journal of Anxiety Disorders, vol. 68, Art. No. 102148, 2019. [Online]. Available at: https://doi.org/10.1016/j.janxdis.2019.102148.

[31] G. León-Úniveros, C. García-Lino, I. Rosales-Pariona, J. León-Úniveros, A. Huamani-Huaracca, S. Ramos-Cosi, and A. Alva-Mantari, "Comparative and quantitative analysis of vulnerability in emergency situations in schools for children under 13 years of age pre and post-pandemic in Peru," International Journal of Engineering Trends and Technology, vol. 72, no. 5, pp. 243-251, May 2024. [Online]. Available at: https://www.scopus.com/record/display.uri?eid=2-s2.0-85195476933&origin=recordpage.

[32] G. Perez-Olivos, E. Garcia-Carhuapoma, E. Gurreñero-Seguro, J. Méndez-Nina, S. Ramos-Cosi, and A. Alva-Mantari, "Observational

quantitative study of healthy lifestyles and nutritional status in firefighters of the fifth command of Callao, Ventanilla 2023," International Journal of Advanced Computer Science and Applications, vol. 15, no. 1, pp. 347-355, 2024. [Online]. Available at: https://www.scopus.com/record/display.uri?eid=2-s2.0-85184999849&origin=recordpage.

[33] H. Darling, "Basics of statistics - 5: Sample size calculation (iii): A narrative review for the use of computer software, tables, and online calculators," vol. 4, pp. 394, 2021. [Online]. Available at: https://doi.org/10.4103/CRST.CRST_88_21.

[34] L. Castro-Martín, M. Rueda, and R. Ferri-García, "Combining statistical matching and propensity score adjustment for inference from non-probability surveys," J. Comput. Appl. Math., vol. 404, Art. No. 113414, 2021. [Online]. Available at: https://doi.org/10.1016/J.CAM.2021.113414.

[35] M. G. Craske and M. B. Stein, "Anxiety," The Lancet, vol. 388, no. 10063, pp. 3048-3059, Dec. 2016. [Online]. Available at: https://www.sciencedirect.com/science/article/pii/S0140673616303816?via%3Dihub.

[36] S. Yang, V. Schmied, E. Burns, and Y. Salamonson, "Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan: A cohort study," Women and Birth: Journal of the Australian College of Midwives, vol. 32, no. 3, pp. e334-e340, 2019. [Online]. Available at: https://doi.org/10.1016/j.wombi.2018.08.167.

[37] J. Crick, "Analyzing survey data in marketing research: A guide for academics and postgraduate students," Journal of Strategic Marketing, vol. 32, pp. 203-215, 2023. [Online]. Available at: https://doi.org/10.1080/0965254X.2023.2176533.

[38] A. Zsido, S. Teleki, K. Csokasi, S. Rozsa, and S. Bandi, "Development of the short version of the Spielberger state—trait anxiety inventory," Psychiatry Research, 2020. [Online]. Available at: https://doi.org/10.1016/j.psychres.2020.113223.

[39] M. Abdulahi, A. Fretheim, A. Argaw, and J. Magnus, "Adaptation and validation of the Iowa infant feeding attitude scale and the breastfeeding knowledge questionnaire for use in an Ethiopian setting," International Breastfeeding Journal, vol. 15, 2020. [Online]. Available at: https://doi.org/10.1186/s13006-020-00269-w.

[40] R. Artal and S. Rubenfeld, "Ethical Issues in Research. Best practices and research," Obstetrics and Clinical Gynecology, vol. 43, pp. 107-114, 2017. [Online]. Available at: https://doi.org/10.1016/j.bpobgyn.2016.12.006.

[41] F. Loffing, "Raw data visualization for common factorial designs using SPSS: A syntax collection and tutorial," Frontiers in Psychology, vol. 13, 2022. [Online]. Available at: https://doi.org/10.3389/fpsyg.2022.808469.

[42] E. Castilla and P. Chocano, "A new robust approach for multinomial logistic regression with complex design model," IEEE Transactions on Information Theory, vol. 68, pp. 7379-7395, 2021. [Online]. Available at: https://doi.org/10.1109/TIT.2022.3187063.

[43] C. Stroud, L. Walker, M. Davis, and C. Irwin, "Investing in the Health and Wellness of Young Adults," The Journal of Teenage Health: Official Publication of the Society for Adolescent Medicine, vol. 56, no. 2, pp. 127-129, 2015. [Online]. Available at: https://doi.org/10.1016/j.jadohealth.2014.11.012.

[44] B. Caira-Chuquineyra, D. Fernández-Guzmán, A. Meza-Gómez, B. Luque-Mamani, S. Medina-Carpio, C. Mamani-García, M. Romani-Peña, and C. Díaz-Vélez, "Prevalence and factors associated with adolescent pregnancy among sexually active adolescent girls in Peru: Evidence from Demographic and Family Health Survey, 2015-2019," F1000Research, vol. 11, 2023. [Online]. Available at: https://doi.org/10.12688/f1000research.108837.2.