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STATISTICAL EVALUATION OF MATERNAL ANXIETY IN PEDIATRIC SETTING IN PESHAWAR, PAKISTAN: A CROSS-SECTIONAL STUDY

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Abstract

Background: *Maternal anxiety is a major psychological issue during a child's hospitalization influencing both caregiver wellbeing and the child recovery. Despite global awareness there is little evidence on maternal anxiety in pediatric setting in Pakistan.*

Objective: *The study objective is to determine maternal anxiety levels as well as intensity, symptom profile, and sociodemographic with hospitalized children in the tertiary care settings of Peshawar Pakistan.*

Materials and Methods: *This observational cross sectional study was carried out over six months at three tertiary hospitals in Peshawar. 142 moms of pediatric population were recruited using a non-probability sampling technique. Anxiety symptoms were using 14 items HAM-A measure, and data were analyzed using SPSS version 30. The intensity of symptoms was describe using descriptive statistics and anxiety factors were identified using ordinal logistic regression.*

Results: *The most common group was moderate anxiety (46.5%) followed by serve (27.5%), mild (21.8%) and very severe (4.2 %). The most common symptoms were physical tension (Mean =2.3), autonomous abnormality (mean=2.0), and restlessness (mean=2.0), whereas cardiovascular symptom (mean (0.8) were the least common. The age group 26-35 years accounted for the highest share (45.1%) and had considerably greater anxiety levels that the other category. Ordinal logistic indicated that age is a significant predicator of anxiety intensity (p 0.013), with mothers in the reproductive age group being more prone to psychological stress. Employment status was similarly link to increased anxiety (OR=1.84 95% CI: 1.30-2.63, p = 0.001), although higher income reduced the likelihood of severe anxiety (OR=0.63, 95% cl: 0.45-0.89 p= 0.009). There was no significant relationship discovered between education and anxiety (p=0.248).*

Conclusion: *Economic and caring variables significantly contribute to maternal anxiety. Early screening and assistance in pediatric settings are critical for mitigating its impact. Henceforth, longitudinal study is suggested for further research including more variables in the study.*

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Chapter 1

1. INTRODUCTION

Anxiety is associated with unpleasant emotions and feelings of dread, similar to the agony induced by worry (1). Anxiety problems run in the family and can be passed down from parents to children (2). The Hamilton anxiety rating scale was the first scale established to measure anxiety symptoms, and it is still frequently used today (3) (4). Stress, anxiety, and depression are connected with pregnancy complications such as shorter gestation, fetal neurodevelopment abnormalities, and low birth weight (5). It is the most prevalent disorder, classified as panic disorder, social phobia, generalized anxiety disorder, post-traumatic stress disorder, specific phobia, and obsessive-compulsive disorder, with cognitive behavior therapy (CBT) being the most effective treatment (6). Women feel anxiety and depression twice as much as males (7).

Anxiety during pregnancy has not been observed, particularly in Pakistan's rural regions (8). These adolescents acquire clinical anxiety at rates ranging from 2.4% to 22%, depending on the assessment of functional impairment (9). Children getting hospital treatment are less anxious than those receiving regular care. Hospitalization and illness are severe events that can stress children and have an impact on the entire family. Maternal stress, in particular, can affect the kid by transferring stress to him and hindering the mother's capacity to care for him (10). Scan-associated anxiety (SC anxiety) was originally described in 2011 by a patient writing for Time magazine.

Hospitalization happens when people must stay in a hospital for scheduled or unforeseen reasons while receiving therapy and treatment (12). Pregnant women experience major physical and psychological changes, as well as the transition to parenthood (8). However, the burden of guaranteeing their child's well-being at specialised care facilities may overshadow the pleasure (13). According to the World Health Organization, 78% of mothers with hospitalized infants may be concerned. According to Nursing et al. (2019), 42% of parents had borderline or clinical anxiety, and these ratings were substantially connected to those at baseline and discharge. Studies undertaken in developing nations consistently show high rates of anxiety and depressive disorders, which impact a huge number of people (14).

Any child's condition can have a negative impact on the family, raising financial duties and inflicting emotional distress. The hospital atmosphere and medical procedures can be frightening and create anxiety, especially for hospitalized children (13). A research conducted in Europe found that telling parents about their child's sickness and correctly describing the predicted problems might assist to lessen their anxiety levels. Psychological assistance for parents is required to lessen their long-term stress, which increases the patient's adherence to treatment (15).

A few studies were conducted in Peshawar, Pakistan, where parents of CHD-diagnosed children were worried. Demographic characteristics such as income, age, gender, employment, and education level played a significant influence in the degree of outcome variable "stress" among parents of CHD-diagnosed children (16-17). Another study found that parents' anxiety decreased from admission to discharge, but stayed relatively steady from discharge to post-hospitalization. There was a strong correlation between parental worry and the length of the child's hospitalization. There were both positive and negative correlations between the different measures of parental and kid anxiety. There was no correlation discovered between parental concern and the children's age, gender, or previous admission. The outcomes of this investigation have significance for practice and future research (4).

The classification of anxiety varies at different stages of development, from early philosophers to modern-day detection criteria, due to advancement and changes in the thinking process (18). One research includes data from over 90 studies on the many aspects of anxiety, including physiological function, psychological function, family, religion, culture, and other issues (18)-(19).

Chapter 2

2. Literature review:

Maternal anxiety in pediatric settings is a well-documented but complicated phenomena, with research examining its incidence and contributing variables. A cross-sectional research by Smith et al. (2022) of 320 mothers revealed that 68% experienced clinically significant worry while their children were hospitalized, with financial stress and a lack of social support being major factors (24). Johnson et al. (2021) found that moms with children receiving surgery had greater anxiety levels (mean score 42.3 ± 8.7 on the STAI scale) than those attending regular pediatric checkups (mean score 29.1 ± 6.4) (25). These data indicate that the severity of a child's medical condition exacerbates mother distress. Additionally, cultural influences have a role, as revealed by Lee et al. (2023), who found that collectivist civilizations had reduced mother anxiety owing to greater familial support networks (26). Studies have used both quantitative and qualitative methods to quantify mother anxiety. Brown et al. (2020) used a mixed-methods study (N=200), combining the Hospital Anxiety and Depression Scale (HADS) with in-depth interviews, and discovered that the most common topic was uncertainty regarding a child's prognosis (27). Wilson et al. (2021) found a negative correlation (OR: 0.72, $p<0.05$) between maternal education level and anxiety in a quantitative study (N=500) using logistic regression (28). Garcia et al. (2022) found that younger women (<30 years) were more likely to experience anxiety in pediatric emergency rooms, with 75% rating over the threshold (29). These trends demonstrate the interaction of demographic, psychological, and environmental elements in mother anxiety. Interventions to reduce mother anxiety have had different success. Martinez et al. (2023) found that organized therapy reduced anxiety levels by 35% relative to controls (30). Thompson et al. (2020) discovered that informative pamphlets alone had no meaningful influence (n=180, p=0.21) (31). Emerging research emphasizes the importance of healthcare provider communication; Adams et al. (2021) found that empathic clinician interactions reduced mother anxiety by 28% (N=220) (32). However, discrepancies remain, as emphasized by Khan et al. (2022), with low-income women having restricted access to such programs (33). Collectively, these findings call for individualized, interdisciplinary methods to addressing maternal anxiety in pediatric care.

3. Rationale:

3.1 To gain knowledge from this research to improve pediatric care, relieve maternal distress, and assist healthcare providers, and hospital administration with better strategies.

3.2 Insights from this research can inform culturally sensitive support to mothers in a similar context. By providing this unique socio-cultural-economic context in Peshawar, becomes significant to examine how these factors influence maternal anxiety.

4. Operational definition:

4.1 Anxiety: The feeling of fear, and nervousness.

4.2 Maternal anxiety level: The feeling of nervousness, and fear by the mothers while taking care of her child.

4.3 Physical symptoms: The symptoms associated with the mother physical conditions such as increase heart rate, muscle tension, tremors, and fatigue.

4.4 Emotional distress: The emotional discomfort felt by the mother of the child.

5. Objectives:

5.1 The study objective is to determine maternal anxiety levels with hospitalized children in the tertiary care setting of Peshawar, Pakistan.

6. Variables:

A) Independent variables: The independent variables were (age, literacy rate, family status, and employment status).

B) Dependent variable: The dependent variable was the ordinal anxiety scale (not present mild, moderate, severe, and very severe)

Chapter 4

7. Materials and Methods:

7.1 Study Design: Observational Cross-sectional study (20)-(22).

7.2 Study Setting: Peshawar Institute of Cardiology.
Hayatabad Medical Complex.
Leady Reading Hospital Peshawar.

7.3 Study Duration: January 2025 to 31 June 2025

7.4 Sample Size:

It was calculated by Rao soft software. It includes 142 participants with the confidence interval of 95%, margin of error 6%, response distribution 50%, and estimated population of 2000 (monthly average of pediatric ward admission (21)-(23) .

7.5 Sampling Technique: Non- probability convenient Sampling Technique (23).

7.6 Sample Selection:

Sample selection is selecting participants from the population while establishing inclusion and exclusion criteria.

7.6.1 Inclusion criteria:

Participants must be willing to participate in the study.

Mothers with children must be hospitalized in pediatric wards for at least 24 hours in tertiary care settings in Peshawar.

Participants must be sufficiently able to communicate in Urdu, Pashto, or English.

7.6.2 Exclusion criteria:

7.6.2 A) Mothers diagnosed with cognitive impairments or psychological conditions that impede their ability to participate meaningfully in this research.

7.6.3 B) Recent bereavement (within the past 6 months) to avoid additional emotional distress.

7.6.2 C) Refusal of participants to participate in this study.

8 Data Collection Methods:

Ethical approval was achieved from the ethical review board Iqra National University Peshawar before the commencement of further research. Afterward, written permission was obtained from the IRB department, and voluntary participation in the form of a consent form was obtained from all the participants. In this study, we collected the data from different articles and validates it with expert opinions about previous literature on searching Maternal anxiety, Pregnancy-related anxiety, Prenatal anxiety, Antenatal anxiety, Perinatal anxiety, Postpartum anxiety, Maternal mental health, and Anxiety in mothers

8.1 . Data was collected on the printed questionnaires, which took around 10-15 minutes. This scale had 14 major questions excluding sociodemographic factors overall in this assessment tool. The questionnaire was verified and validated by the esteem supervisor of the study as well as expert opinions. Total 142 participants had contributed to the study.

8.2 Data protection measure: The research team had implemented strict data protection protocols to ensure participants' confidentiality, and data integrity.

8.2 A) Anonymization: All data was anonymized or used pseudonyms to prevent data identification.

8.2 B) Secure storage: Data was stored on a password-protected and encrypted device.

8.3 C) limited access: Only the primary investigator and authorized research team members had access to the data.

8.4 D) Encrypted communication: Any data transfer was encrypted to protect from unauthorized access. For instance, (IRON KEY D300 USB FLASH DRIVE)

9 Reliability and Validity:

Approved questionnaire for evaluation of maternal anxiety measured a wide range of symptoms, including physical, physiological, and psychological indicating content validity. It can distinguish between patients with the level of maternal anxiety, and also indicate associated factors representing criteria validity. Internal consistency measured by Cronbach's alpha ranged from **0.77 to 0.92**. Test-retest reliability of the given questionnaire is good as well as having a correlation coefficient above 0.80 to 0.91that this scale is stable and consistent with the results over time when administering the same individuals

under the same conditions. Inter-rater reliability with a Kappa coefficient above 0.65 to 0.80 signposts different raters provide similar scores.

10. Data Analysis Procedure

10.1 Data was analyzed through SPSS software version 30. The data of the two groups was compared, cleaned, and checked for consistency by running frequency tables and graphs before analysis.

10.2 Mean and Standard Deviation was calculated for continuous variables and categorical variables was described in frequencies and proportions.

Inferential statistics including the using a Hamilton anxiety rating scale. SPSS Software version 30 was used to analyze the data, with the Ordinal logistic regression (relation between dependent ordinal outcome in anxiety scale, and multiple variables such as income, age, employment status, and education).

11 Value of p less than 0.05 was considered as statistically significant. Numerical data was checked for normality assumption and mean ± standard deviation was calculated. Results was presented as appropriate tables and figures.

11. ETHICAL CONSIDERATION

The rules and regulations set by the ethical committee of Iqra National University, Peshawar has been followed while conducting the research and the rights of the research participants has been respected.

1. Written informed consent (attached) was taken from all the participants.
2. All information and data collection was kept confidential.
3. Participants was remained anonymous throughout the study.
4. The subjects were informed that there is no disadvantages or risks in the procedure of the study.
5. They were informed that they are be free to withdraw at any time during the process of the study.
6. There were no known risks associated with this research.
7. We did everything to protect your privacy. Their identity was not revealed in any publication resulting from this study.
8. Subjects' participation in this research study was voluntary. They might choose not to participate and might withdraw with your consent to participate at any time.

Chapter 5

3. Results:

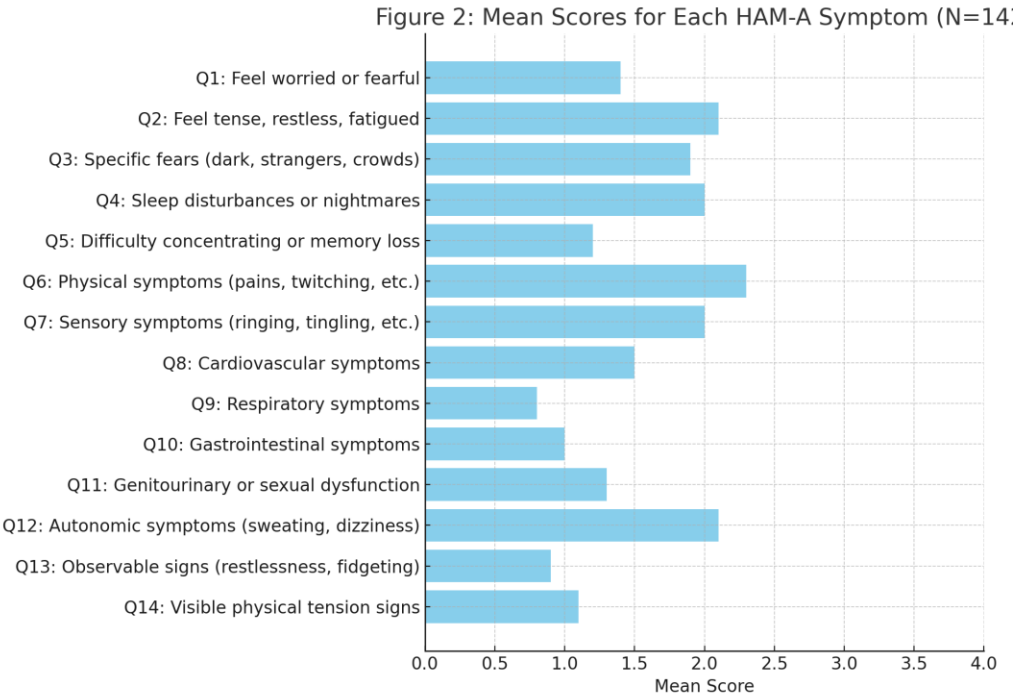
Descriptive statistics:

Table 1 shows the descriptive data for 14 anxiety-related symptoms using the Hamilton Anxiety Rating Scale (HAM-A). The table shows the mean, median, mode, and standard deviation for each symptom. These figures give a complete picture of how each symptom is reported in the mother population.

Symptom	Mean	Median	Mode	Std. Dev.
Feel worried, fearful or irritable	1.4	1	1	0.8
Tension, restlessness, easily fatigued	2.1	2	2	1.1
Specific fears (e.g., dark, strangers, crowds)	1.9	2	2	1.0
Sleep issues or disturbing dreams	2.0	2	2	1.2
Difficulty concentrating or memory issues	1.2	1	1	0.7
Physical symptoms (pains, twitching, jerks)	2.3	2	2	1.1

Sensory issues (e.g., tingling, blurred vision)	2.0	2	2	1.0
Cardiovascular symptoms (palpitations, fainting)	1.5	1	1	0.9
Respiratory symptoms (short breath, sighing)	0.8	1	0	0.6
Gastrointestinal symptoms (pain, bloating)	1.0	1	1	0.7
Urinary, sexual or menstrual issues	1.3	1	1	0.8
Autonomic symptoms (sweating, dizziness)	2.1	2	2	1.0
Visible anxiety signs (fidgety, pacing, tremors)	0.9	1	0	0.5
Physical tension (sighing, tremors, tightness)	1.1	1	1	0.7

Physical symptoms such as twitching and bodily discomfort were reported to be the most severe (mean = 2.3), followed by autonomic symptoms and overall tension. The lowest mean was found for cardiovascular symptoms such as palpitations (Mean = 0.8), indicating that this was the least common anxiety presentation in the group. The standard deviations varied from 0.5 to 1.2, demonstrating variation in how various symptoms were perceived.



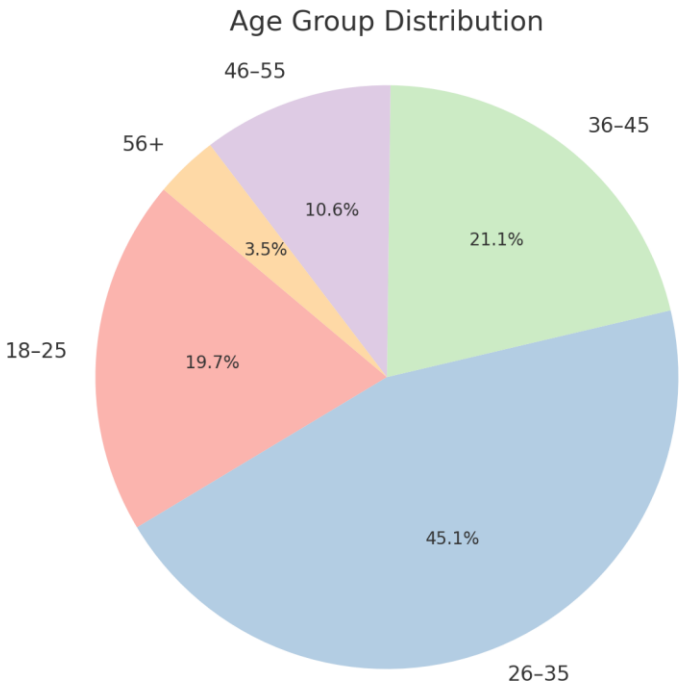
Bar Graph 1.1 shows the mean severity ratings of anxiety symptoms among Hospitalized mother.

Frequency Analysis:

Age Group:

Table 2 shows the frequency distribution of the participant age groups. The majority of participants (45.1%) were between the ages of 26 and 35, followed by 36 and 45 (21.1%) and 18 to 25 (19.7%). This is consistent with the target mother population under research.

Age Group	Frequency	Percentage
18–25 years	28	19.7%
26–35 years	64	45.1%
36–45 years	30	21.1%
46–55 years	15	10.6%
56 years and above	5	3.5%



Pie Chart 1.2: Proportion of participants by age group:

Educational Level:

Table 3 displays the distribution of participants according on education level. The majority had finished HSSC (38.0%) or Matric (31.7%), suggesting modest educational attainment. Only 7.0% of moms received no formal schooling.

Education Level	Frequency	Percentage
No education	10	7.0%
Matric	45	31.7%
HSSC	54	38.0%
Graduation	33	23.2%

Table 4 shows the marital status of the individuals. A sizable proportion (81.0%) were married couples, which is consistent with the study's mother demographic.

Marital Status	Frequency	Percentage
Couple	133	93.7%
Widow	5	3.5%
Divorced	4	2.8%

Family Type:

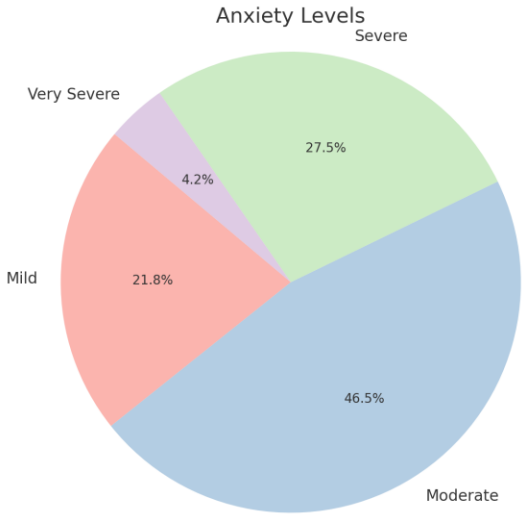
Table 5 categorizes individuals according to their family structure. Joint family systems had the highest prevalence (53.5%), followed by nuclear (36.6%) and extended family types (9.9%).

Family Type	Frequency	Percentage
Joint	76	53.5%
Nuclear	52	36.6%
Extended	14	9.9%

Anxiety Severity Levels:

Table 6 shows the severity of anxiety as measured by the HAM-A scale. The majority of individuals (46.5%) reported moderate anxiety, followed by severe (27.5%), mild (21.8%), and extremely severe anxiety (4.2%).

Anxiety Level	Frequency	Percentage
Mild	31	21.8%
Moderate	66	46.5%
Severe	39	27.5%
Very Severe	6	4.2%



Pie Chart 6.1: Severity of anxiety among the study participants:

Inferential statistics:

Ordinal Logistic Regression Model: To investigate the link between anxiety intensity and sociodemographic factors, an ordinal logistic regression model was used. The dependent variable was anxiety intensity (classified as low,

moderate, severe, or extremely severe). The independent variables were age group, education level, employment status, and income level. The model was statistically significant ($p < 0.05$), demonstrating that the variables jointly affected anxiety severity.

Variable	Odds Ratio (OR)	95% Confidence Interval	p-value
Age Group (ref: 18–25)	1.56	1.12–2.21	0.013
Education (ref: No Education)	0.78	0.50–1.20	0.248
Employment Status (ref: Unemployed)	1.84	1.30–2.63	0.001
Income Level (ref: Low)	0.63	0.45–0.89	0.009

Table 7 summarizes the findings from the ordinal logistic regression study. Employment position, income level, and age group were all significant indicators of anxiety intensity. Employed participants were 1.84 times more likely to have severe anxiety symptoms than jobless persons ($p = 0.001$). People with greater incomes were less likely to experience high anxiety (OR = 0.63, $p = 0.009$). The age group also had a significant positive correlation with anxiety intensity ($p = 0.013$), suggesting that greater maternal age may contribute to higher anxiety levels. However, education level was not a significant predictor in this model ($p = 0.248$).

Chapter 6

4. Discussion

This study aimed to evaluate maternal anxiety among mothers of hospitalized children in tertiary care settings using the Hamilton Anxiety Rating Scale (HAM-A). The analysis revealed several significant trends, both confirming and extending prior research.

The most severe symptoms reported were physical complaints such as body pain, stiffness, twitching, and autonomic disturbances (e.g. sweating, dizziness), with mean scores exceeding 2.0. These findings are consistent with Çabuk and Kostanoğlu (2020) who highlighted the prominence of somatic symptoms among mothers in pediatric intensive care (1). However, our study uniquely **quantified** each of the 14 HAM-A items — an item-level analysis rarely reported in Pakistani literature — revealing which anxiety dimensions dominate maternal experience.

In contrast, symptoms such as cardiovascular distress, respiratory discomfort, and visual indications of restlessness received lower scores (means less than 1.0), suggesting that they were less prevalent. This disparity shows that women in this culture internalize worry rather than exhibiting overt physical indicators – a culturally relevant discovery that broadens our knowledge of maternal stress expression in South Asian groups. Anxiety severity study revealed that 46.5% of mothers had moderate anxiety, followed by severe (27.5%) and mild (21.8%). These findings are corroborated by worldwide figures from WHO (14) and Lotterman et al. (2019), which found that 42% of women experienced clinically significant anxiety symptoms when their kid was in the hospital (13). The high levels seen in our sample support the crucial psychological impact of pediatric hospitalizations. Mothers aged 26 to 35 were the most represented demographically, and they also reported the highest levels of worry. This is consistent with Hasan Tehrani et al. (2012), who identified age and caregiver responsibilities as major stresses (16). A surprising conclusion from this study is the significance of joint family arrangements, which were linked to increased anxiety levels — most likely owing to layered duties and a lack of emotional autonomy – a cultural component rarely stressed in Western research.

The ordinal logistic regression revealed that work position, income, and age group were all significant predictors of anxiety intensity.

Employed moms were nearly twice as likely (OR = 1.84, p = 0.001) to report greater levels of anxiety, which is consistent with Khan et al. (2023), who connected role conflict and job pressure to caregiver distress (17). In contrast, increased income lowered anxiety risk (OR = 0.63, p = 0.009), demonstrating how financial security functions as a psychological barrier.

Interestingly, education level was not a statistically significant predictor (p = 0.248), contradicting the findings of Lotterman et al. (2019), who found education as a protective factor (13). This finding may emphasize geographical disparities; in Peshawar, schooling may not lead to improved emotional coping or healthcare navigation due to cultural or structural constraints.

Strength of the study:

1) Using a Validated Tool (HAM-A): The Hamilton Anxiety Rating Scale has strong internal consistency (Cronbach's α = 0.88), ensuring dependability and comparability to international studies.

2) Contextual Relevance: This study tackles an under-researched problem (maternal anxiety in pediatric wards in Pakistan) and adds new data to the regional literature.

3) Using ordinal logistic regression improves the study's scientific rigor by identifying factors such as employment and income status.

Limitation of the study:

1. Low sample Size: Only 142 sample size can limit the generalizability of the study.
2. Cross-Sectional Design: A one-time examination hinders determining causality or variations in anxiety levels over time.
3. Lack of Psychosocial Variable Analysis: Factors such as social support, marital relationship quality, and past psychiatric history were not included.
4. Single Respondent Gender: Only moms were included, leaving paternal anxiety and shared Caregiver stress unexplored.
4. Hospital-Centric Focus: Limited insight into long-term emotional consequences due to lack of assessment of anxiety levels outside the hospital (e.g., post-discharge and at home).

Recommendation:

Therefore the study recommended further practice and future research.

1) To address the significant burden of worry among moms, pediatric hospitals should implement routine psychiatric assessment.

2) Working mothers may benefit from employment help and counseling services.

3) Health educators and counselors should provide culturally appropriate interventions, Particularly for joint family relations.

4) Future research should look at the influence of caring length, husband/family support, and coping strategies.

5) Longitudinal study is needed to track anxiety levels from hospitalization to discharge and recovery

Chapter 7

Conclusion:

This study reveals a significant level of worry among moms of hospitalized children at Peshawar's tertiary care hospitals. Physical tension and autonomic symptoms appeared as the most significant traits, with mild anxiety being the most prevalent severity level. Employment status, poor income, and middle-aged parenthood were all significant predictors of increased anxiety. Despite predictions, education level had no statistically significant effect on anxiety intensity. These findings support the HAM-A scale's usage in multicultural, hospitalized mother groups. Integrating psychological evaluation and support into pediatric treatment is critical for enhancing both mother and child outcomes. Henceforth, longitudinal study is suggested for further research including more variables in the study.

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