

Original Article

# Psychological distress among parents of children with obstetric brachial plexus injury visiting pediatric departments

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## Abstract

Obstetrical brachial plexus injury (OBPI) is a severe nerve injury that is destructive with expected lifelong repercussions among affected children. A child with morbidity can affect a family in several ways, encompassing social, relational, financial, and emotional states. However, such effects on households remain mostly unrecognized, where the focus remains solely on the child's health or his/her treatment endeavors, with little attention given to the parent's emotional state. Therefore, this study aimed to measure psychological distress among parents of children with OBPI. This descriptive cross-sectional study recruited 100 parents with children aged between 18 months and 16 years under treatment for OBPI who visited different healthcare facilities using a purposive sampling technique. Data were collected by conducting face-to-face interviews. The study used the General Health Questionnaire-12 (GHQ-12) to assess parents' psychological distress. The positive items were assigned scores from 0 to 3 (i.e., always to never), and the negative items were assigned scores from 3 to 0 (i.e., always to never). The outcome score ranged between 0 and 36, with higher scores indicating a greater likelihood of general psychological distress. Descriptive statistics were calculated to achieve the study objectives. Most children suffering from OBPI were male (64%) rather than female (36%). All positive items of the GHQ-12 questionnaire had an average low score, indicating parents were not feeling reasonably happy, less able to concentrate on their routine work, somewhat incapable of making decisions, and unable to enjoy day-to-day activities. In contrast, negative items had an average high score, indicating that parents constantly felt under strain, could not overcome difficulties, felt unhappy and depressed, and lost confidence. The average GHQ-12 score was  $23.47 \pm 2.54$ , depicting a high level of psychological distress among parents of children with OBPI. Our study concluded that parents of children with OBPI are at potential risk of various psychological problems. Therefore, health personnel should be aware of these parents' psychological adjustment and refer them for psychological support when necessary.

## Keywords

Psychological distress; Obstetric brachial plexus neuropathies; Pediatrics; Public hospitals; Private hospitals

## 1. Introduction

Nerve injuries can affect the patient's mobility, which may cause paralysis of the affected limb and difficulty performing daily activities [1]. Obstetrical brachial plexus injury (OBPI) is a nerve injury that is destructive with expected lifelong repercussions among affected children [2]. Children with OBPI are likely to develop complications such as spindly arms, shoulder injuries, or dislocation of shoulder joints [3]. The risk factors for OBPI include shoulder dystocia, spontaneous vaginal delivery, breech delivery, cesarean delivery, instrumental delivery, macrosomia, maternal diabetes, and complex or prolonged labor for any reason [4, 5, 6]. The incidence rate of OBPI varies with the type

of previously conducted studies; globally, it ranges between 0.1 and 6.1 per 1000 live newborn infants [7].

OBPI is a rare disorder that generally involves an injury in the shoulder and axillary regions of the child [8]. Children with OBPI often cannot perform their tasks independently, rely on their parents or attendants to perform their daily activities and are referred to specialized healthcare professionals for treatment [9]. It helps preserve muscle mass and regain lost muscular strength, preventing muscle shortening and deformities in affected limb joints. Children with OBPI need regular follow-up, which takes considerable time and may continue for an unprecedented period depending upon several factors, including the severity of the injury, parental beliefs, knowledge, and attitudes toward the disease [10, 11].

Children with OBPI require early diagnosis and treatment, whether conservative or operative, depending on the degree of nerve damage [12]. Conservative management is preferred in cases of minimal neuronal damage or nondegenerative nerve injuries [13]. The treatment of OBPI focuses on the prevention of muscular atrophy, prevention of secondary deformities, suppression of pain, recovery of somatosensory deficits, and post-operative care [14]. Treatment protocols are developed with modalities and exercises based on a detailed history and thorough physical examination [4]. These modalities include therapeutic ultrasound for muscle relaxation and electrical nerve stimulators for simulating compressed nerves due to underlying pathology [8]. Initially, passive exercises are performed, followed by an active exercise plan with assistance. The child learns the movement pattern with time, and a home plan is devised for the child [15]. The treatment and recovery of nerve injuries can be challenging due to the slowest rate of neuronal regeneration.

A child with morbidity can affect a family in several ways, encompassing social, relational, financial, and emotional states [16, 17]. Such effects on households remain mostly unrecognized, especially in developing countries such as Pakistan, where the focus remains solely on the child's health or his/her treatment endeavors, with little attention given to the parent's emotional state. It is also evident from the literature that mothers and fathers are exposed to increased stress levels and are at risk of psychological distress [18].

Understanding the psychological distress experienced by families, especially parents of children with OBPI, is crucial so that interventions can be suggested following the parents' needs. In addition, a dearth of local literature is available highlighting the impact of OBPI on parents. Therefore, this study was conducted with the objective of measuring psychological distress among parents of children with OBPI visiting public and private healthcare facilities using the General Health Questionnaire-12 (GHQ-12).

## **2. Material and methods**

### *2.1. Study design and ethics approval*

This descriptive cross-sectional study obtained ethical clearance from the Central College of Family Physicians (No. CCFP-ERC-22003) and sought administrative approval from the targeted healthcare facilities. The data were collected for nine months, between February and October 2022.

### *2.2. Study setting*

We conducted the study at five public and private healthcare facilities, including Jinnah Hospital, Children Hospital, Meer Children & Family Clinic, Mayo Hospital, and Physio Rehab & CP Clinic, Lahore.

### 2.3. Participants' recruitment

The study recruited parents of children between 18 months and 16 years under treatment for OBPI and parents willing to become part of the study [18]. However, children under treatment for less than six months and parents having any other child with a disability and already on antidepressants were excluded from the study.

### 2.4. Sampling technique and sample size

This sample size of 45 was calculated using the Raosoft calculator by keeping a 5% margin of error, a 95% confidence interval, and a 3% response distribution [19]. However, the study recruited 100 parents using a nonpurposive sampling technique.

### 2.5. Study instrument

A few close- and open-ended questions were used to calculate children's and their parent's demographic information. Additionally, we used a reliable and validated GHQ-12 scale to assess parents' psychological distress [20].

### 2.6. Data collection

The researcher conducted face-to-face interviews with the parents at the targeted healthcare facilities for an average duration of 10 minutes.

### 2.7. Study measures

The demographic section of the questionnaire comprised a set of questions, including the child's age, gender, attendant relation with the child, parent's age, locality of the family, parent's occupation, and parents' monthly household income. In addition, the GHQ-12 consisted of 12 items, each assessing the severity of psychological distress over the past few weeks using a 4-point Likert-type scale (from 0 to 3). The positive items were corrected from 0 (always) to 3 (never), and the negative items were corrected from 3 (always) to 0 (never). The overall outcome score ranged between 0 and 36, with higher scores indicating a greater likelihood of general psychological distress [20].

### 2.8. Statistical analysis

The descriptive statistics were calculated using frequencies, percentages, mean, standard deviation, median, interquartile, minimum, and maximum. The data were analyzed using Statistical Package for Social Sciences (SPSS) (version 25.00).

## 3. Results

Table 1 depicts children suffering from obstetric brachial plexus injuries had an average age of  $3.59 \pm 2.36$  years. The average monthly parent's income was Pakistani rupees (PKR)  $47,860.00 \pm 15,238.19$ .

**Table 1.** Sociodemographics of children's families (n = 100)

Variables	Mean $\pm$ SD	Range	
		Min.	Max.
Child's age (in years)	$3.59 \pm 2.36$	1.50	11.00
Mother's age (in years)	$32.69 \pm 4.05$	22.00	44.00
Father's age (in years)	$37.03 \pm 5.61$	27.00	51.00
Parent's monthly income (in PKR)	$47,860.00 \pm 15,238.19$	25,000.00	90,000.00

Most children suffering from OBPI were male (64%) rather than female (36%). A meager number of children's mothers were employed (21%), and the majority were housewives (79%). Moreover, 44% of parents realized the injury of their children a few days after birth, followed by 30% of parents who realized it after examination by medical personnel, 17% a few weeks after birth, and 9% a month after birth. Table 2 further delineates that mothers accompanied 86% of children suffering from OBPI as attendants.

**Table 2.** Sociodemographics and medical characteristics of children's families (n = 100)

Sociodemographic Characteristics		N	%
Gender of the child	Male	64	64.00
	Female	36	36.00
The locality of the family	Rural	26	26.00
	Urban	74	74.00
Mother's occupation	Employed	21	21.00
	Housewife	79	79.00
Father's occupation	Self-employed	12	12.00
	Employed	82	82.00
	Unemployed	6	6.00
Attendant's relationship with the child	Mother	86	86.00
	Father	14	14.00
Hospital visited	Public hospital	65	65.00
	Private hospital	35	35.00
Knowledge of injury	A few days later, after birth	44	44.00
	A few weeks later, after birth	17	17.00
	A month later after birth	9	9.00
	During examination by medical personnel	30	30.00

Table 3 shows that all positive items of the GHQ-12 questionnaire had an average low score, indicating parents were not feeling reasonably happy, less able to concentrate on their routine work, somewhat incapable of making decisions, and unable to enjoy day-to-day activities. In contrast, negative items had an average high score, indicating that parents constantly felt under strain, could not overcome difficulties, felt unhappy and depressed, and lost confidence. The average GHQ-12 score was  $23.47 \pm 2.54$ , depicting a high level of psychological distress among parents of children with OBPI.

**Table 3.** Psychological distress among parents of children with OBPI (n = 100)

Description	Mean Score (Mean $\pm$ SD)
Able to concentrate	1.18 $\pm$ 0.69
Playing a useful part	1.39 $\pm$ 0.78
Capable of making decisions	1.12 $\pm$ 0.78
Able to enjoy day-to-day activities	1.22 $\pm$ 0.84
Able to face problems	1.31 $\pm$ 0.86
Feeling reasonably happy	0.91 $\pm$ 0.59
Loss of sleep over worry	1.99 $\pm$ 0.70
Felt constantly under strain	2.33 $\pm$ 0.60
Could not overcome difficulties	2.15 $\pm$ 0.63
Feeling unhappy and depressed	2.25 $\pm$ 0.61
Losing confidence	2.03 $\pm$ 0.72
Thinking of self as worthless	1.85 $\pm$ 0.83
Overall score	23.47 $\pm$ 2.54

#### 4. Discussion

Our study showed that more children suffering from OBPI were male than female. A meager number of children's mothers were employed, and the majority were home-makers. Moreover, half of the parents realized the injury of their children a few days after birth, followed by parents who realized it after examination by medical personnel, a few weeks after birth, and a month after birth. All positive items of the GHQ-12 questionnaire had an average low score, indicating parents were not feeling reasonably happy, less able to concentrate on their routine work, somewhat incapable of making decisions, and unable to enjoy day-to-day activities. In contrast, negative items had an average high score, indicating that parents constantly felt under strain, could not overcome difficulties, felt unhappy and depressed, and lost confidence. The average GHQ-12 score was significant, showing a high level of psychological distress among parents of children suffering from OBPI.

The results of our study are consistent with an Australian study that assessed stress levels in fathers and mothers of children with OBPI and recruited 26 pairs of parents who completed self-reports of global stress, psychological distress, and condition-related stress [18]. The study revealed that both parents of children with OBPI experienced psychological distress; no difference was observed between fathers' and mothers' mean scores. Furthermore, all stress variables were strongly correlated for the mothers [18].

Our study's results are also consistent with another study carried out in Turkey that assessed the level of anxiety and depression burnout among mothers of children with OBPI and the effects of their recovery on the mothers' mental health [21]. The study incorporated 18 mothers, and the Narakas classification system was used to assess the severity of OBPI; the Beck Anxiety Inventory, Beck Depression Inventory, and Maslach Burnout Inventory were used to assess mothers' mental health. The results highlighted that mothers of infants in Narakas group III had mild depression, and their depression score constantly increased along with mothers with infants in Narakas group II. In contrast, mothers with infants in Narakas groups I and II showed a minimal anxiety score. Furthermore, there was no statistically significant difference between anxiety, depression, emotional exhaustion, depersonalization, and personal accomplishment scores of the mothers concerning the severity of the OBPI [21].

Another study conducted in the United Kingdom (UK) using EQ-5D-5 L and characteristic questionnaires aligns with our results that revealed poorer mean utility scores of the OBPI patients ( $0.80 \pm 0.19$ ) and parents ( $0.56 \pm 0.28$ ) than the standard scores of the English population [22]. In addition, the parents and patients reported poor quality of life with mental health issues. Additionally, a survey that included 51 parents using Patient Health Questionnaire-9 (PHQ-9) and PCL-S screening tools reported that 46% of the responding mothers and two out of ten fathers having newborns with OBPI had depression [23]. OBPI is a cause of psychological distress among sufferer families, which may be due to the illness's longevity and fear of possible surgery for the OBPI child, which is evident from the previously conducted mixed method study that showed that surgery of the OBPI child was a significant predictor of a higher Impact On Family Scale (IOFS) total impact score ( $p = 0.02$ ) [24].

Contrary to our results, a study highlighted that parents with children with OBPI were moderately affected by their child's disorder [25]. Similarly, another study assessed the quality of life of parents of children with neonatal brachial plexus palsy and identified different system- and patient-related factors that contribute to the quality of life, specifically emotional adjustment, and revealed that the parents' reported quality of life was overall good [26]. Nevertheless, such disorders among children can cause trauma for par-



ents and caregivers who directly or indirectly look after their children, with increasing responsibilities affecting their daily life activities, social life, and mental health [27, 28].

This study contributes to the scientific literature focusing on the Pakistani perspective, which marks the potential strength of the study. On the other hand, the study was performed for a limited time and counted on one tool for assessing psychological distress, which marks a study's weakness.

## 5. Conclusions

Our study concluded that parents of children with OBPI are at potential risk of various psychological problems. Therefore, health personnel should be aware of these parents' psychological adjustment and refer them for psychological support when necessary. We recommend further research to explore healthcare professionals' perspectives regarding parental psychological distress and health systems' strengths for minimization of parental psychological distress and early diagnosis and prompt management of OBPIs to improve the quality of life of parents as well as children.

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**Ethics statement:** This study obtained ethical clearance from the Central College of Family Physicians (No. CCFP-ERC-22003) and sought administrative approval from the targeted healthcare facilities.

**Consent to participate:** Informed consent was obtained from all participants included in the study.

**Data availability:** All data are presented in this study.

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**Conflicts of interest:** The authors declare no conflicts of interest.

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