Psychiatric Morbidity among Primary Caregivers of Children with Neurodevelopmental Disorders at a Teaching Hospital in Kenya

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https://doi.org/10.56893/ajhes2024v03i02.06

Abstract

Background: Psychiatric morbidities are often underdiagnosed among the primary caregivers of children with neurodevelopmental disorders who attend child clinics; however, they are frequent and are associated with adverse outcomes. An integrated management program, which is an evidence-based approach to psychiatric morbidity management, remains an exception in most hospital settings. This study investigated the prevalence of psychiatric morbidity and its associated factors among primary caregivers of children with neurodevelopmental disorders.

Methods: A descriptive cross-sectional study was conducted with 357 respondents in child clinics at a teaching hospital between January 2023 and December 2023.

Results: Most respondents (225, 63%) had at least one psychiatric morbidity, and the majority had major depressive episodes (147, 41.2%). Lack of family support was associated with at least one psychiatric morbidity ($p = 0.009$).

Conclusion: Primary caregivers of children with neurodevelopmental disorders attending outpatient child clinics experience psychiatric issues, especially major depressive episodes and anxiety disorders. Primary caregivers without an alternative caregiver or family support are more likely to suffer from psychiatric disorders.

Keywords: Primary caregiver, neurodevelopmental disorders, psychiatric morbidity, child clinics, mental illness, Kenya

Introduction

According to the World Health Organization (WHO), 25% of the global population may suffer from mental and neurological disorders. In comparison, 10 – 20% of children and adolescents have psychiatric disorders, including neurodevelopmental disorders (NDD) (WHO, 2001) (Levav & Rutz, 2002). Previous reports have documented a 50% increase in psychiatric disorders among children and adolescents, with an increasing trend in recent years (WHO, 2020). Also, 15-20% of these children worldwide have been estimated by the WHO to have disabilities, with 85% living in developing countries. This underpins the need for a primary caregiver to offer care to children with disabilities (Udoh et al., 2021). Nurturing a child with neurodevelopmental disorders may be

associated with a psychological burden on primary caregivers (Abdi et al., 2019).

Regionally, 89% of the primary caregivers (PCG) have psychological disorders that are not addressed. Over 93% have never been evaluated for any psychiatric illness (Adedeji et al., 2022). Psychological distress among primary caregivers of children with neuro-developmental disorders may be due to isolation, stigma, financial strain, sleep deprivation, high demand for caregiving, emotional strain, physical strain, and neglect of personal well-being (Doi et al., 2022). In the bio-psycho-social model of causation of mental illness, psychosocial factors can predispose individuals to mental illness.

In Africa, the burden of caregiving among the primary caregivers of children with neurodevelopmental disorders has been a topic of growing concern, particularly in relation to mental health outcomes (Paruk & Ramdhial, 2018). In Ethiopia, Minichil et al. (2021) documented that 57.6% of primary caregivers of children with neurodevelopmental disorders experienced depression. In Ghana (Ocansey et al., 2021), the prevalence rates of depression and anxiety disorders among primary caregivers of children with neurodevelopmental disorders were documented to be 56.2% and 66.2%, respectively. Paruk and Ramdhial (2018) in their study done in South Africa, noted that primary caregivers are prone to isolation, stigma, exhaustion, financial strain, sleep deprivation, reduced quality of life, and emotional and physical stress. These factors predispose them to depression and anxiety disorders.

In Kenya, the prevalence of psychiatric morbidity among the primary caregivers of children with neurodevelopmental disorders in Kenya has not been documented (Otieno, 2013). This gap informs the need to conduct this study in a local setting. Knowledge of psychiatric morbidity patterns among the primary caregivers of children with neurodevelopmental disorders attending child clinics will provide new data that may also help create intervention programs. These programs may aim to promote, prevent, treat, link, provide care, and support strategies.

Problem Statement

Professional health education programs have evolved to reflect changes in healthcare service provision. Mental health issues receive less attention and priority compared to other conditions, particularly within hospitals, and the situation is worse in community settings. No policies have been adopted to curb increasing mental health conditions, especially among primary caregivers (Huang et al., 2018). Additionally, screening tools for psychiatric morbidities have not been incorporated into the assessment of this high-risk population (Fang et al., 2016).

Primary caregivers of children with neurodevelopmental disorders are among those at a high risk of enduring a lot of psychological burden in their day-to-day caregiving duties (Areia et al., 2019). Healthcare workers mostly focus on

children and sometimes fail to assess caregivers who are more likely to be prone to other psychiatric morbidities (Hareendran et al., 2020). The absence of guidelines and policies regarding mental health issues at the hospital level, as noted by Udoh et al. (2021), has exacerbated the ongoing problem.

Effective healthcare services hinge on addressing the psychiatric challenges faced by primary caregivers. Thus, a comprehensive healthcare strategy is essential. Without considering the needs of primary caregivers, the mental health services provided to a child may fall short.

Purpose of the Study

The primary aim of this study was to assess the prevalence of psychiatric issues among primary caregivers of children with neurodevelopmental disorders attending clinics at a Teaching Hospital. The research sought to investigate clinical factors contributing to psychiatric morbidity in caregivers and identify the socio-demographic factors associated with this issue.

Research Questions

1. What is the prevalence of psychiatric morbidity among primary caregivers of children with neurodevelopmental disorders attending child clinics at a teaching hospital in Kenya?
2. What are the socio-demographic factors associated with psychiatric morbidity among primary caregivers of children with neurodevelopmental disorders attending child clinics at a teaching hospital in Kenya?
3. Which clinical factors are associated with psychiatric morbidity among primary caregivers of children with neurodevelopmental disorders attending child clinics at a teaching hospital in Kenya?

Literature Review

Primary caregivers play an important role in the well-being of children with neurodevelopmental disorders, often placing them under significant emotional and psychological strain. Neurodevelopmental disorders, which encompass conditions such as autism spectrum disorder, attention deficit hyperactivity disorder, and intellectual disabilities, not only affect children but also impose a considerable burden on caregivers. Developmental delays in children can lead to major difficulties in daily activities, such as mobility, learning, self-help, language, and even living independently (Huang et al., 2018). This contributes to the burden of caregiving. These children may also need substantial help in their daily activities.

A primary caregiver has been defined as a person whose main duty is to take care of an individual who cannot take care of themselves (Adelman et al., 2014). Hareendran et al. (2020) defined a primary caregiver as an individual with a greater responsibility for caring daily and meeting the child's physical needs. According to WHO (2015) (Beard et al. 2016), a child is defined as a young human being aged 12 years or younger, specifically prior to puberty.

Children with neurodevelopmental disorders often have unique needs that must be addressed. Campbell et al. (2018) stated that nurturing a child with a neurodevelopmental disorder may be associated with a psychological burden on primary caregivers. Primary caregivers experience very peculiar challenges, and to offer good caregiving, they also need to be in the right state of mind. According to the WHO (2015) Comprehensive Mental Health Action Plan (2013-2020) (Chen et al., 2022), interventions were made to reduce the morbidity, mortality, and disability of people living with mental disorders. This was in tandem with the Sustainable Development Goals, which aimed for good health and well-being (Rosa & Hassmiller, 2020).

Psychiatric Morbidity

Existing research has highlighted that caregivers of children with neurodevelopmental disorders frequently experience high levels of stress, anxiety, and depression. Psychiatric morbidities are common and are highly prevalent in the primary caregivers of children with neurodevelopmental disorders, including depression and anxiety disorders (Ocansey et al., 2021). Several studies have been done that also shown that primary caregivers are prone to other forms of mental illness. For instance, substance use disorders have also been documented among primary caregivers; however, their prevalence has not been clearly stated (Kumar et al., 2021). Parents of children with neurodevelopmental disorders are likely to experience psychiatric disorders such as depression. At the same time, the mother, being mostly the primary caregiver, is usually at a higher risk (Sharma et al., 2021). Khalid et al. (2021) documented that 94% of mothers and 66.7% of fathers providing caregiving services have depressive symptoms, anxiety, or even both.

Psychosocial distress has been shown to contribute to the development of mental illnesses. This has been demonstrated in the bio-psychosocial model of the causation of mental illness. Some authorities (Almogbel et al., 2017) explained that the caregivers of children with neurodevelopmental disorders may experience increased stress and are more likely to have a significant burden on caregiving than those with children who are developing well, worsening the already existing difficult situation. Furthermore, the prevalence of depression has a twofold increase in their estimates compared to the general population (Seaman et al., 2015). Financial strain, high demand for caregiving, and emotional and physical strain have been documented to increase levels of psychological distress among caregivers (Okewole et al., 2011).

Socio-demographic Factors

Gender

Gender is one of the important socio-demographic variables. Different studies have been conducted and have found that females are prevalent among the primary caregivers of children with neurodevelopmental disorders (Campbell et al., 2018; Maridal et al., 2021; Schulz & Sherwood, 2008). These studies also documented that females have a higher

prevalence of psychiatric illnesses during caregiving. Sharma et al. (2021) compared psychiatric morbidity among 99 male and 98 female caregivers of children and adolescents with mental illnesses. Female caregivers had a higher prevalence of mental illnesses, mostly depression and anxiety, than their male counterparts. Cultural norms have traditionally assigned gender roles, specifically to women. Molebatsi et al. (2017) documented that 86.3% of primary caregivers' participants were female. Research has shown that women predominantly bear caregiving responsibilities.

Age

Caregivers' age can significantly influence their caregiving experience, capabilities, and challenges. Hsiao et al. (2022) a study done in Japan, showed that the primary caregivers who had ages 40-59 years were more likely to have a psychiatric morbidity. In addition, Stansfeld et al. (2014), in a study in England, documented that those between 35-44 years had an association with psychiatric morbidity.

It is common for primary caregivers to have comorbidities, which might worsen the existing burden. In Nepal, Maridal et al. (2021) documented ages of 31-45 years among the PCG. Some studies encompassed the mean age of the PCG unlike the ranges. Olagunju et al. (2017) in Nigeria found that the mean age of the PCG was 54.12 years, while Paruk and Ramdhial (2018) found 42.95 years which in both studies was associated with psychiatric morbidity.

Marital Status

The marital status of caregivers can significantly influence their caregiving experiences in several ways, including shared responsibilities, emotional support, financial resources, and support networks. Research has highlighted that intimate relationships among married individuals play a crucial role in fostering mental wellness (Sharma et al., 2021). For instance, a study conducted in Saudi Arabia (Almogbel et al., 2017) found that a majority of primary caregivers (66%) were married and experienced lower rates of mental illnesses compared to their unmarried counterparts. Additionally, studies by Doernberg and Hollander (2016) and Fang et al. (2016) indicate that unmarried primary caregivers are more likely to suffer from psychiatric disorders.

Clinical Factors

Duration of Caregiving

Longer duration of caregiving has been shown to have a positive association with psychiatric morbidities among primary caregivers. Prolonged caregiving can lead to increased stress over time, burnout, isolation, health decline, and financial strain. Fang et al. (2016) found a twofold increase in psychiatric morbidity in primary caregivers who had offered caregiving services for five years or more. Several studies have found that caregiving duration is associated with psychiatric morbidity (Hareendran et al., 2020; Kaiser et al., 2009; Kazdin, 2000). Chhagan et al. (2014) showed that the duration of more than five years of caregiving was significantly associated

with three times the odds of having psychiatric morbidity.

Alternative Caregiver

An alternative caregiver relieves the primary caregivers of the caregiving duties, creating time for them to recharge and re-energize. The presence of an alternative caregiver has been shown to help alleviate the stressful event of caring for a child with neurodevelopmental disorders (Minichil et al., 2021). This promotes their physical, psychological, and social well-being, as they may have time to engage in wellness activities.

The presence of an alternative caregiver reduces burden, increases respite, offers social support, promotes healthier relationships, and enhances the quality of care. Campbell et al. (2018) conducted a study in South Africa that showed that the presence of an alternative caregiver was important in the alleviation of the risk of psychiatric morbidities. This has been echoed in other studies (Bhatia et al., 2015 ; Marimbe et al., 2016).

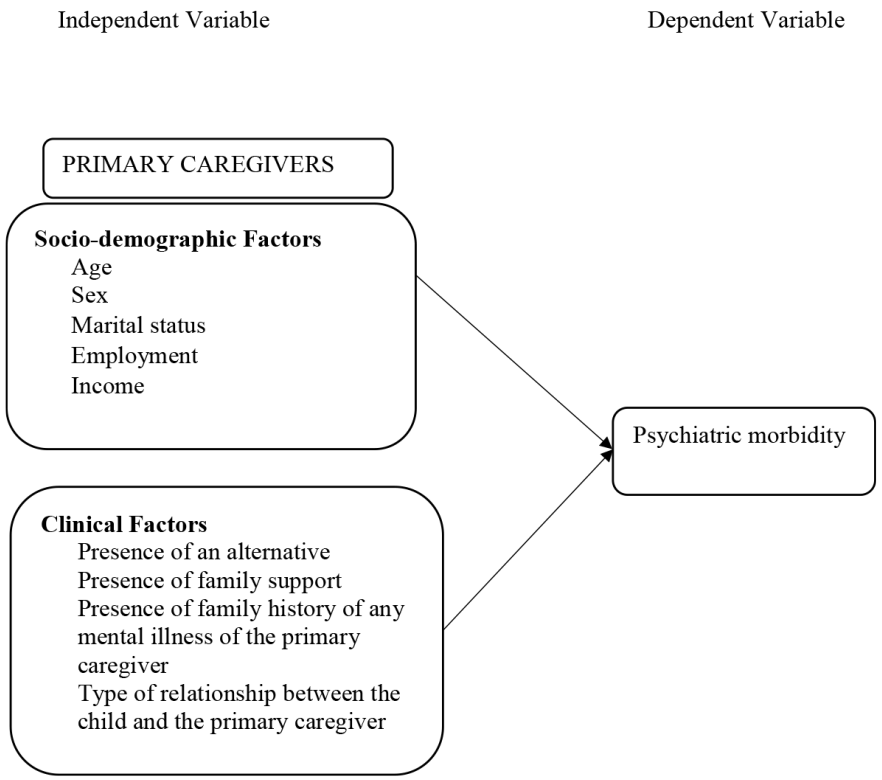
Family Support

Family support plays a crucial role in the general well-being of a primary caregiver. Family support has been shown to enhance the mental well-being of PCG (Derajew et al., 2017). With family support, the general well-being of the PCG will contribute to a decline in psychiatric morbidity (Maridal et al., 2021). It is paramount to have family support since these children usually have a chronic illness that needs assistance in caregiving (Coid et al., 2003).

Several benefits can be achieved by providing family support including emotional support, practical assistance, financial support, and social engagement. Campbell et al. (2018) and Zhou et al. (2018) have documented that family support is important for the general well-being of children with neurodevelopmental disorders. Minichil et al. (2021) documented a positive association between poor family support and psychiatric morbidity in Ethiopia. The conceptual framework represents independent and dependent variables (See Figure 1).

Figure 1

Conceptual Framework



Methodology

Research Design

This descriptive cross-sectional study was conducted at the Child Outpatient Clinic (Child Psychiatric Clinic, Child Pediatric Clinic, and Occupational Therapy Clinic) of a government referral hospital in Kenya. This study design enables the collection of baseline data at a snapshot.

Research Setting

This study was conducted in child clinics at a government referral hospital in Kenya. The hospital is also a teaching hospital for the College of Health Sciences at a local government university. The region around the hospital has approximately 18 million people from diverse cultures. This study was conducted between January 2023 and December 2023.

Sampling

The sample size was calculated using Fisher's formula (Fisher, 1935) for a single population proportion to generate 357 participants. Systematic random sampling was used to select 357 primary caregivers with a sampling interval of $k = 2$. Those included were over 18 years

old, had provided care for more than six months, and were not compensated.

Data Collection

Data from 357 respondents were collected using the Mini International Neuropsychiatric Interview (MINI) Version 7.0 (Sheehan et al., 2010) of the Diagnostic and Statistical Manual-5 to generate psychiatric morbidity diagnoses. A researcher-designed questionnaire containing socio-demographic and clinical factors was also used. This tool was piloted among 36 primary caregivers at a county hospital to check its reliability. The Cronbach's alpha was 0.85, indicating good reliability. Content validity was established, thereby redefining the assessment tools based on participants' feedback.

Data Analysis

The collected data was entered, organised, and cleaned. Data was then analysed using frequencies and percentages, while logistic regression was employed to establish the association between the factors and the psychiatric morbidities. The odds ratio was used to test the association, with a significance level (alpha) set at 0.05.

Ethical Considerations

Ethical approval for this study (FAN:0004311) was obtained from the Institutional Research and Ethics Committee (IREC) at Moi University and Moi Teaching and Referral Hospital, as well as from the National Commission for Science, Technology, and Innovation (NACOSTI) under reference number NACOSTI/P/23/23037. Informed consent was obtained from all the respondents who agreed to participate, as evidenced by their signatures. Privacy and confidentiality were ensured at each stage. The research documents were stored in lockable cabinets, and data was protected using a password in a Microsoft Access database. Participants were informed about the study's purpose and had the right to withdraw at any time.

Results

This study included 357 primary caregivers of children with neurodevelopmental disorders who attended the child clinics. A response rate of 100% was achieved. The results discussed include the prevalence of psychiatric morbidities as well as clinical factors and socio-demographic factors associated with them among the study participants.

Socio-demographic Characteristics of the Participants

More than three-quarters of the respondents (86.4 %) were female, 70.0% were aged between 18-37 years and two-thirds (66.4 %) were married. The majority (96.6 %) were Christians, 74.5% earned less than 10,000 Kenyan shillings (76.92 US Dollars) per month, about half, 50.1% lived in an urban residence, 51.6% had temporary employment, and 41.7% had attained a tertiary level of education. The respondents' socio-demographic profiles are shown in Table 1.

Table 1
Socio-demographic Characteristics of the Participants

Variable		*n* (%)
Age of Caregiver	18-37	250 **(70.0)**
	38-57	103 (28.9)
	58-77	4 (1.1)
Age of child	0-4	256 **(71.7)**
	5-9	91 (25.5)
	10-14	10 (2.8)
Gender of the Caregiver	Female	308 **(86.3)**
	Male	49 (13.7)
Gender of the Child	Female	126 (35.3)
	Male	231 **(64.7)**
Marital status	Married	237 **(66.4)**
	Not Married	81 (22.7)
	Separated	35 (9.8)
	Widowed	4 (1.1)
Education	None	2 (0.6)
	Primary	76 (21.3)
	Secondary	130 (36.4)
	Tertiary	149 **(41.7)**
Employment	None	125 (35.0)
	Permanent	48 (13.4)
	Temporary	184 **(51.6)**
Religion	Christian	345 **(96.6)**
	Muslim	11 (3.1)
	Traditional	1 (0.3)
Residence	Neither urban or Rural	8 (2.3)
	Rural	170 (47.6)
	Urban	179 **(50.1)**
Income	0-10000	266 **(74.5)**
	10000-50000	88 (24.6)
	>50000	3 (0.9)

Clinical Factors Characteristics of the Participants

The vast majority (95%) reported no family history of mental illness, 90.2% did not have chronic illnesses, and 91.0% were parents. Nearly three-quarters (73.7%) had a caregiving duration of 0-4 years, two-thirds (61.3%) had an alternative caregiver, and over half (56.6%) received family support (Table 2). This suggests that primary caregivers may take multiple social roles with increased commitments and responsibilities. These findings underscore the importance of providing alternative caregivers and family support. Policies and guidelines should be established to enhance awareness of the clinical factors that could help reduce psychiatric morbidities and promote mental well-being.

Table 2

Clinical Factors Characteristics of the Participants

Variable	*n* (%)
Duration of caregiving	
0-4	263 **(73.6)**
5-9	87 (24.4)
10-14	7 (2.0)
Diagnosis of the child	
Attention Deficit Hyperactivity Disorder	26 (7.3)
Autism Spectrum Disorder	102 (28.6)
Communication Disorder	100 (28.0)
Intellectual Disability	116 **(32.5)**
Motor and Tic Disorder	13 (3.6)
Duration of illness of the child	
0-4	285 **(79.8)**
5-9	67 (18.8)
10-14	5 (1.4)
Alternate caregiver	
No	138 (38.7)
Yes	219 **(61.3)**
Family support	
No	155 (43.4)
Yes	202 **(56.6)**
Family history of mental illness	
No	339 **(95.0)**
Yes	18 (5.0)
Chronic illness of caregiver	
No	322 (90.2)
Yes	35 (9.8)
Relationship with the child	
Extended family	28 (7.9)
Guardian	4 (1.1)
Parent	325 (91.0)

Participants with at least one Psychiatric Morbidity

Psychiatric morbidities among primary caregivers of children with neurodevelopmental disorders were assessed in this study. Of the respondents, 63% had at least one psychiatric morbidity (Figure 2), about half (44.3 %) had one psychiatric morbidity, and 18.8% showed comorbidity (Figure 3). Tailored interventions can be implemented to address psychiatric morbidity among caregivers. These interventions would target screening, diagnosis, treatment, and prevention.

Figure 2

Participants with at Least One Psychiatric Morbidity

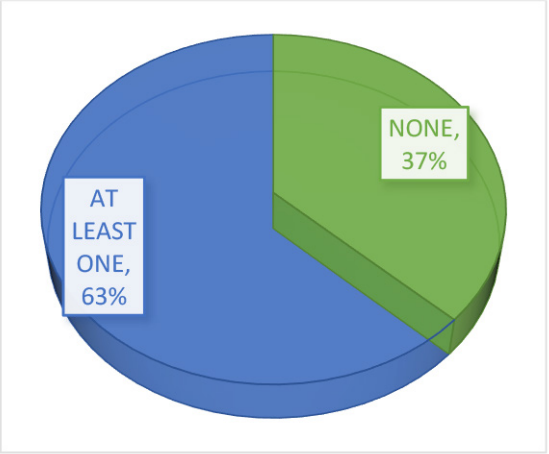
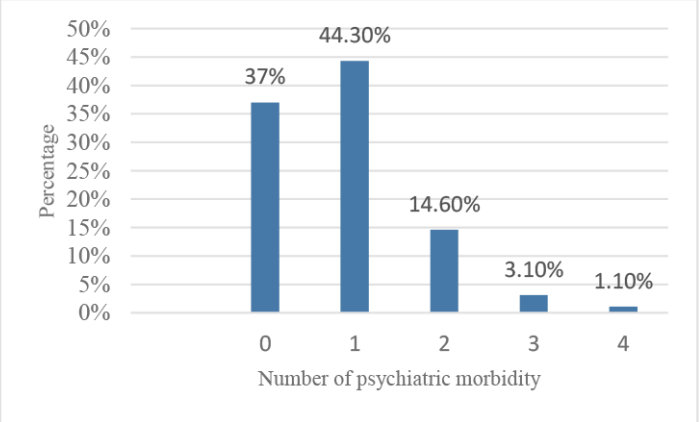


Figure 3

Number of Psychiatric Morbidity per Participant



Prevalence of Psychiatric Morbidity among the Study Participants

Approximately half of the participants (41.2%) had major depressive episodes, 16.2% had obsessive-compulsive disorder, and 14.0% had panic disorder. Those with alcohol use disorder were 4.5%, 2.8% had suicidality, and 2.5% had social anxiety disorder (Table 3). This emphasizes the need for specialized mental health services tailored to the unique challenges faced by caregivers to ensure that they have access to appropriate resources. Targeted intervention strategies aimed at reducing the incidence of psychiatric morbidity, such as stress management programs or counseling services, can be incorporated.

Figure 4

Prevalence of Psychiatric Morbidity among the Study Participants

Variable	*n* (%)
Major depressive episode	**147 (41.2)**
Obsessive compulsive disorder	58 (16.2)
Panic disorder	50 (14.0)
Alcohol use disorder	16 (4.5)
Suicidality	10 (2.8)
Social anxiety disorder	9 (2.5)
Post-traumatic stress disorder	7 (1.9)
Psychotic & mood disorders with psychotic features	7 (1.9)
Generalised anxiety disorder	5 (1.4)
Agoraphobia	1 (0.3)
Substance use disorder	1 (0.3)

Participants' Socio-demographic Characteristics and Psychiatric Morbidity

A bivariate logistic regression was used to measure the correlation between the socio-demographic variables and the psychiatric morbidity variable, as indicated in Table 4. Primary caregivers aged over 38 years were more likely to have at least one psychiatric morbidity ($p = 0.043$). The level of significance was set at 95%. This means that there is a 4.3% chance that the observed association between being a caregiver aged 38 or older and having psychiatric morbidity occurred by random chance. Age is a significant socio-demographic factor linked to psychiatric morbidity. Understanding this is crucial for identifying vulnerable populations and designing targeted interventions to promote their mental wellness.

Table 4

Participants' Socio-demographic Characteristics Association with Psychiatric Morbidity

Variable	Psychiatric morbidity		*p* value
	No (*n*=132) *n* (%)	Yes (*n*=225) *n* (%)	
Age of Caregiver			**0.043**
<38	101 (40.4)	149 (59.6)	
>38	31 (29.0)	**76 (71.0)**	
Age of Child			0.120
0-4	101 (39.5)	155 (60.5)	
5-9	26 (28.6)	65 (71.4)	
10-14	5 (50.0)	5 (50.0)	
Gender of Caregiver			0.633
Female	112 (36.4)	196 (63.6)	
Male	20 (40.8)	29 (59.2)	
Gender of Child			0.359
Female	51 (40.5)	75 (59.5)	
Male	81 (35.1)	150 (64.9)	
Marital Status			0.450
Married	92 (38.8)	145 (61.2)	
Not Married	29 (35.8)	52 (64.2)	
Widowed/separated	11 (28.2)	28 (71.8)	
Education			0.316
Primary	26 (33.3)	52 (66.7)	
Secondary	44 (45.8)	52 (54.2)	
Tertiary	62 (41.6)	87 (58.4)	
Employment			0.988
None	47 (37.6)	78 (62.4)	
Permanent	18 (37.5)	30 (62.5)	
Temporary	67 (36.4)	117 (63.6)	
Religion			0.372
Christian	126 (36.5)	219 (63.5)	
Muslim/Traditional	6 (50.0)	6 (50.0)	
Residence			0.649
Neither urban nor Rural	4 (50.0)	4 (50.0)	
Rural	64 (37.6)	106 (62.4)	
Urban	64 (35.8)	115 (64.2)	
Income			0.314
<10000	94 (35.3)	172 (64.7)	
≥10000	38 (41.8)	53 (58.2)	

Bivariate Logistic Regression Analysis for Participants' Clinical Factors and Psychiatric Morbidity

This study also sought to determine the clinical factors associated with psychiatric morbidity among the primary caregivers of children with neurodevelopmental disorders. In the bivariate logistic regression analysis, clinical factors that were statistically significant included lack of an alternative caregiver (p = 0.044), lack of family support (p = 0.002), and family history of mental illness (p = 0.022) (Table 5). The lack of an alternative caregiver and insufficient family support were found to be statistically significant factors associated with psychiatric morbidity. This situation may lead to chronic stress, exhaustion, and social isolation, all of which are known risk factors for developing mental health issues. It is crucial to monitor primary caregivers who exhibit these clinical factors to ensure they receive prompt care. This highlights the need for mental health awareness programs that promote respite care and enhance family involvement. Additionally, training alternative caregivers and raising community awareness about their importance can greatly benefit those in need.

Table 5

Bivariate Logistic Regression Analysis of Participants' Clinical Factors and Psychiatric Morbidity

Variable	Psychiatric Morbidity		*p* value
	No (*n* = 132) *n* (%)	Yes (*n*=225) *n* (%)	
Duration of caregiving			0.106
≤4	104 (39.5)	159 (60.5)	
>4	28 (29.8)	66 (70.2)	
Diagnosis			0.815
Attention deficit hyperactivity disorder	9 (34.6)	17 (65.4)	
Autism spectrum disorder	33 (32.4)	69 (67.6)	
Communication disorder	39 (39.0)	61 (61.0)	
Intellectual disability	46 (39.7)	70 (60.3)	
Motor and tic disorder	5 (38.5)	8 (61.5)	
Duration of illness			0.222
≤4	110 (38.6)	75 (61.4)	
>4	22 (30.6)	50 (69.4)	
Alternate caregiver			**0.044**
No	42 (30.4)	96 **(69.6)**	
Yes	90 (41.1)	129 (58.9)	
Family support			**0.002**
No	43 (27.7)	112 **(72.3)**	
Yes	89 (44.1)	113 (55.9)	
Family history of mental illness			**0.022**
No	130 (38.3)	209 (61.7)	
Yes	2 (11.1)	16 **(88.9)**	
Chronic illness of caregiver			0.581
No	121 (37.6)	201(62.4)	
Yes	11 (31.4)	24 (68.6)	
Relationship			1.000
Extended family	10 (35.7)	18 (64.3)	
Parent/Guardian	122 (37.1)	207 (62.9)	

Multivariate Logistic Regression of Socio-demographic and Clinical Factors and Psychiatric Morbidity

A multivariate logistic regression model was used for further analysis. After controlling for confounding effects, the lack of family support (AOR = 0.52, 95% CI: 0.32, 0.85; p = 0.009) was found to be significant (Table 6). This finding highlights the need for enhanced support programs to strengthen family involvement. This insight can inform policy development focused on providing resources and support for families, such as counselling services or caregiver support groups, to promote healthier family relationships.

Table 6

Multivariate Logistic Regression Analyses of Socio-demographic, Clinical Factors, and Psychiatric Morbidity

Socio-demographic and clinical factors	UOR	95% CI	*p*-value	AOR	95%CI	*p*-value
Age of Caregiver						
<38	1			1		
≥38	1.66	1.03, 2.73	0.041	1.37	0.78, 2.43	0.300
Alternate Caregiver						
No	1			1		
Yes	0.63	0.40, 0.98	0.043	0.84	0.51, 1.38	0.500
Family Support						
No	1			**1**		
Yes	0.49	0.31, 0.76	0.002	**0.52**	0.32, 0.85	**0.009**
Family history of Mental Illness						
No	1			1		
Yes	4.98	1.39, 31.8	0.034	4.4	1.16, 29.0	0.058

Key: CI = Confidence Interval, AOR = adjusted odds ratio, UOR = unadjusted odds ratio

Discussion

Psychiatric Morbidity Pattern

Of the 357 study participants who filled out the questionnaires at the outpatient child clinic of a referral hospital, 63% had at least one psychiatric morbidity. This could be attributed to psychological distress due to the caregiving burden, implying that mental illnesses are not uncommon among primary caregivers. This study findings align with a study conducted in Pakistan (Khalid et al., 2021) which documented a prevalence rate of 64.6%. In contrast, studies in Nepal (Maridal et al., 2021) and Nigeria (Okewole et al., 2011) have documented lower levels of 42.4% and 39.4%, respectively. This could be attributed to the studies focusing on caregivers of children with mental disorders, unlike this study, which focused on those with neurodevelopmental disorders only. In addition, unlike the MINI, the General

Health Questionnaire-12 (GHQ-12) was used in both studies. In Kenya, 56.2% of primary caregivers had at least one mental disorder, although the study also included adolescents and youth with mental illnesses, unlike this study (Otieno, 2013),

Major depressive disorder (41.2 %) was the predominant mental illness among the participants. This may be due to the stressful life situation and probably due to genetic predisposition, as most of the primary caregivers were relatives. Similarly, studies in Poland (Gugała et al., 2019) and Nigeria (Adedeji et al., 2022) have documented prevalence rates of 38% and 39.4%, respectively. Studies have documented the presence of social factors leading to a high prevalence of depression, including isolation, stigma, financial burden, exhaustion, sleep deprivation, and emotional and physical distress.

This study showed that anxiety disorders were also among the most common mental disorders: panic disorder, 14%; social anxiety disorder, 2.5%; generalized anxiety disorder, 1.4%; and agoraphobia, 0.3%. Stress from providing this care can lead to fatigue, sleep or appetite problems, and physical pain, leading to a decline in overall well-being. Caregivers often worry about the condition and prognosis of these children, exacerbating their anxiety symptoms. Studies in Malaysia (Cham et al., 2022) and Pakistan (Khalid et al., 2021) have reported prevalence rates of 19% and 26%, respectively. These studies utilized the Generalized Anxiety Disorder – 7 questionnaire, in contrast to the present study, which employed the MINI tool, thereby contributing to the discrepancy in results. Additionally, the number of study participants was lower than that of the current investigation.

Obsessive-compulsive disorder (OCD) emerges as another significant mental health concern, with a prevalence of 16.2%. This study uniquely highlights this finding. The presence of OCD in primary caregivers substantially diminishes their quality of life and intensifies their perceived burden (Abdi et al., 2019), leading to both mental exhaustion and physical strain. The manifestation of disorders among primary caregivers is not unusual, given that obsessive personality patterns and traits are widely distributed within the general population (Unsar et al., 2021).

Participants' Determinants Associated with Psychiatric Morbidity

In the bivariate logistic regression analysis, psychiatric morbidity was associated with age greater than 38 years, lack of alternative caregivers, lack of family support, and family history of mental illness. Participants over 38 years of age were more likely to have psychiatric morbidities. It is possible that older patients have comorbid disorders as well as a longer duration of caregiving, which could be associated with psychiatric morbidity. Similar studies in Japan and India echoed this finding (Hsiao et al., 2022; Sharma et al., 2021). Studies have documented that caregivers of older age

are more likely to have spent the majority of their time in caregiving, thus having a longer effect from psychological distress. Therefore, this could put them at risk of developing mental illnesses.

In this study, lack of family support was associated with psychiatric morbidity among primary caregivers. Several global and regional studies have documented similar findings (Doi et al., 2022; Huang et al., 2018; Maridal et al., 2021). It is possible that the presence of family support may relieve the strain on caregivers either physically, psychologically, socially, spiritually, financially, or in terms of their workload. Lack of support (need and emotional assistance) from the family can increase the caregiving burden (Otieno, 2013).

In this study, the lack of an alternative caregiver was found to be associated with psychiatric morbidity. This could be due to increased stress and responsibility, burnout, and limited personal time. Similar studies have been conducted in France, South Africa, and the United States (Hareendran et al., 2020; Minichil et al., 2021; Siddiqui & Khalid, 2019). An alternative caregiver creates room for the primary caregiver to recharge and re-energize. The alternative caregiver takes up the role of caregiving by creating time for them to rest and rejuvenate, which is important in promoting their mental health.

Family history of mental illness in the participants was associated with psychiatric morbidity. Genetic factors have been strongly implicated in the development of mental illness (Sadock & Sadock, 2008). Studies in England and Ethiopia (Areia et al., 2019; Derajew et al., 2017) have reported similar findings. In the bio-psycho-social model of the causation of mental illnesses, biological causes like genetics have been shown to play a role (Udoh et al., 2021). Therefore, presence of family support and an alternative caregiver should conceptually lower psychiatric morbidity among the primary caregivers of children with neurodevelopmental disorders.

Conclusion

Many primary caregivers of children with neurodevelopmental disorders attending outpatient child clinics experience psychiatric issues, especially major depressive episodes and anxiety disorders. Furthermore, caregivers without alternative support, family backing, or a history of mental illness in their family are more likely to suffer from psychiatric disorders. Additionally, older primary caregivers are more frequently linked to psychiatric morbidities.

Recommendations

A substantial number of primary caregivers of children with neurodevelopmental disorders have major depressive and anxiety disorders. Therefore, it is recommended to implement comprehensive mental health screening and support programs for primary caregivers of children with neurodevelopmental disorders to address the high prevalence of psychiatric morbidities, particularly major depressive episodes and anxiety disorders.

Primary caregivers who did not have an alternative caregiver lacked family support or had a family history of mental illness were at increased risk of psychiatric disorders. Enhanced support systems are recommended for primary caregivers by providing access to alternative caregiving options, fostering family engagement, and offering mental health resources, particularly for those with a family history of mental illnesses.

Older primary caregivers are more likely to experience psychiatric conditions. It is recommended that specialized mental health resources and support services designed for these caregivers be implemented to help them manage their unique challenges. Additionally, raising awareness about the critical nature of mental healthcare for this group is proposed to foster early intervention and diminish stigma.

Conflict of Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

This study was self-sponsored.

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