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Impact of Migraine on Disability and Quality of Life: Perspective from South Indian Context

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Abstract: Objective: The present study aimed to measure migraine disability scores, severity of depression and quality of life (MIDAS, PHQ-9 and WHOQOL) among migraine patients in South Indian population. **Method:** All participants were examined by a neurologist to confirm the migraine diagnosis. The data collection was conducted at the Bangalore Neuro Centre with a sample of 129 individuals. Pearson Correlation used to explore the relationships between migraine disability, depression severity and quality of life. **Result:** Our results indicated that migraines are significantly associated with depression across different age groups (15-40 years and 41-65 years). Additionally, both migraine and depression were found to impact all aspects of life including physical, psychological, social and environmental functioning. Our study highlighted the interaction between WHOQOL domains suggesting that various aspects of quality of life are interconnected. **Interpretation:** Despite the negative impact of migraines on quality of life, South Indian Population demonstrated better adaption and functioning capabilities compared to other populations.

Keywords: Migraines, Depression, Quality of life and South Indian Population.

INTRODUCTION

Headaches are one of the most common neurological conditions which are affecting individuals globally. It is commonly defined as the pain in any region of the head. The intensity, duration, and etiology of headaches typically vary, ranging from primary headaches like tension headaches and migraines to secondary headaches like sinus headaches. The extent and severity of headaches are underestimated, universally neglected and undertreated (Stovner et al., 2007). Significant declines in overall functioning and quality of life are identified by headaches (D'amico et al., 2013).

The primary headaches, especially migraine affects more than one billion people every year with a high prevalence and morbidity which is mostly seen in young adults and females (Amiri et al., 2022). Migraines are severe, throbbing headaches that frequently are assocaited with light and sound sensitivity, nausea, and vomiting. In addition, a range of syndromes, including cyclic vomiting, abdominal migraine, paroxysmal vertigo, paroxysmal torticollis, and confusional migraine, may be associated with migraines. These syndromes differ in their clinical presentations, durations, and frequencies (Straube & Andreou, 2019). About 12% of Caucasian people suffer from migraines, with women more likely than males to get them (Younger, 2016). In primary care, where it is often underdiagnosed, undertreated, and poorly recognized, it can be challenging to manage (Dowson, 2001). It's a life-threatening illness that interferes with work and school commitments, family relationships, and financial security (Leonardi & Raggi, 2019). The intensity of migraine headaches can range from slight discomfort that does not interfere with daily activities to excruciating agony that causes extended incapacitation, greatly impairing the sufferer's quality of life

(Anand & Sharma, 2007). Adults who are at their most productive years—such as the end of adolescence and the early 1950s—frequently experience primary headaches (Taşkapılıoğlu & Necdet, 2013).

In recent years, there has been a lot of interest in migraine research and how it affects people's quality of life. It is frequently examined using Migraine disability assessment scale -MIDAS (Stewart et al. 1999). This evaluates migraine severity by counting the total number of days in the previous three months when migraines interfered with an individual's productivity and everyday tasks (Stewart et al., 2001). Depression and anxiety, which are typical comorbidities with migraines, are commonly assessed with PHQ. According to studies, greater MIDAS scores, which assess migraine-related impairment, are frequently connected with higher PHQ-9 scores, indicating more severe depressive symptoms. This shows that people who have more severe migraines are more prone to suffer from depression (Dindo et al., 2014).

Assessing a patient's quality of life (QOL) is an excellent technique to measure migraine burden since it targets on activity constraints or short term impairments. (Shaik et al., 2015). The WHOQOL is a comprehensive examination of people's opinions of their place in life, considering their cultural backgrounds and value systems, as well as their personal objectives, standards, and worries (Whoqol Group, 1995). According to research, increased migraine-related disability (higher MIDAS scores) correlates with worse WHOQOL scores, indicating a lower quality of life. Migraines can have a considerable negative impact on everyday activities and general well-being (Leonardi et al., 2010). Higher PHQ-9 scores, showing more serious depressive symptoms, are associated to lower WHOQOL scores, suggesting a poorer quality of life. Depression can have serious consequences in many areas of life, especially one's physical condition, psychological well-being, and social connections (Skevington et al., 2004). Some research investigated the combined correlations of MIDAS, PHQ, and WHOQOL. For example, one study investigated the linked impacts of migraine-related disability, depression, and quality of life (Minen et al., 2016). The study discovered that higher MIDAS scores were strongly related with both higher PHQ scores and lower WHOQOL scores, emphasizing migraines combined deleterious impact on mental health and overall quality of life.

To date, there is no published study on QOL, PHQ and migraine disability among South Indian population. In this study, we aimed to measure all three factors among migraine patients.

METHODOLOGY

The present data was collected in Bangalore Neuro Centre (BNC), which is a neurospeciality and OPD centre in Bangalore. Upon arrival at Bangalore Neuro Centre, the patients were subjected to a full neurological evaluation by qualified neurologist. After the initial screening process using the inclusion and exclusion criteria, the patients were informed about the purpose of the study and consenting patients were asked to complete the written informed consent forms. All participants were then examined by a neurologist to confirm the migraine diagnosis. Sociodemographic information was completed by the researcher. Following the neurological examination and diagnosis, the patients were transferred to the neuropsychology department for additional evaluation of various headache characteristics and their influence on daily functioning. In the neuropsychology unit, we utilised systematic interviews and questionnaires (MIDAS, WHOQOL-BREF and PHQ-9) to learn about the features of their headaches.

A cross-sectional design was used to assess and compare headache characteristics and disability across the migraine patients. The inclusion criteria include patients between 15-65 years of age diagnosed with migraine at least for more than one year by a neurologist and should be familiar with Kannada or English. The exclusion criteria include patients who are not between the age group 15-65 years, patients with any neurological conditions such as epilepsy, strokes and individuals who are not familiar with Kannada or English. The study included South Indian sample of 129 headache patients diagnosed with Migraine

headache. The study sample was divided into two groups. The first group consists of Young to middle aged adults who are aged 15 to 40 years and the second group consists of Middle-Aged to Older adults who are aged 41-65 years.

Tools

1.Migraine Disability Assessment Scale (MIDAS)

It is an often-used tool for measuring the impact of migraines on a person's daily functioning and quality of life. Stewart developed the MIDAS scale, which measures the level of disability caused by migraines over a three-month period with scores ranging from 0 to 92. Based on the overall scores, four disability grades are assigned: grade I, II, III and IV (Stewart et al., 1999).

2. World Health Organization Quality of Life (WHOQOL)

It is frequently used to assess quality of life, especially in the setting of chronic health disorders like migraines. The WHOQOL-BREF is a shorter version with 26 measures that addresses four major domains: physical health (WHOQOL I), psychological health (WHOQOL II), social interactions (WHOQOL III), and environment (WHOQOL IV). Each item is assessed on a 5-point Likert scale, and the scores are converted to a 0-100 scale for comparison. Higher ratings imply a better quality of life (Skevington et al., 2004).

3. Patient Health Questionnaire-9

It is a popular tool for assessing the severity of depression. Each item examines the frequency of depressed symptoms over the previous two weeks, offering a complete picture of the individual's mental health (Kroenke et al., 2001). The PHQ-9 are assessed on a range of 0 to 3. The overall score runs between 0 and 27, with higher numbers indicating more severe depression. The scoring system is commonly divided into five severity levels (Kroenke et al., 2001).

Statistical Analysis

Descriptive statistics, such as means, standard deviations, frequencies were used to summarize the headache characteristics, MIDAS scores, PHQ-9 scores and WHOQOL scores. Pearson Correlation was used to explore the relationships between disability scores, severity of depression and quality of life among migraine patients in two different age groups (15-40 years and 41-65 years). The data was analysed by using IBM SPSS Statistics software 27.0 version.

RESULTS

Table 1 shows that MIDAS score of 25.68 which shows moderate migraine related disability. The high SD (39.03) signifies a vague range of disability levels among patients, from very low to very high. The PHQ-9 score of 6.45 lies within the range for mild depression and SD of 6.74 indicates variability in depressive symptoms, indicating some might have higher levels of depression. A mean score of 56.86 indicates moderate satisfaction with physical health and SD of 13.21 suggests some variability in physical health perceptions among patients. The mean score of 53.27 for psychological health reflects moderate satisfaction, slightly lower than physical health and high SD 17.57 indicates significant variability. A score of 62.69 suggests relatively high satisfaction with social relationships and SD of 21.36 shows substantial variability in social satisfaction. The mean score of 65.73 indicates high satisfaction with environmental conditions and SD of 13.98 points to moderate variability in environmental satisfaction.

Table 1: Descriptive statistics (mean and standard deviation) for MIDAS, PHQ-9 and WHOQOL of Young to middle aged adults

	Mean	SD
MIDAS	25.68	39.03
PHQ-9	6.45	6.74
WHOQOL I	56.86	13.21
WHOQOL II	53.27	17.57
WHOQOL III	62.69	21.36
WHOQOL IV	65.73	13.98

SD = standard deviation

Table 2 illustrates that MIDAS score of 17.75 which shows mild to moderate migraine-related disability and high SD 33.22 shows broad range of responses, with some experiencing very low disability and others experiencing much higher levels. A PHQ-9 score of 3.58 indicates minimal to mild depression and SD of 5.63 shows little variability in depressive symptoms. The mean score of 59.00 indicates a moderate to high level of satisfaction with physical health and SD of 13.20 shows some differences in physical health perceptions. The mean score of 55.94 for psychological health indicates moderate satisfaction. This score is slightly higher in Middle to Older adults, suggesting an improvement in psychological health and SD of 15.89 shows significant variability in psychological health perceptions. The mean score of 67.22 indicates high satisfaction with social relationships and SD of 19.05 shows variability in social satisfaction, but in general patients feel positive about their social relationships. A mean score of 65.72 for the environment domain indicates high satisfaction with environmental conditions and SD of 11.36 suggests moderate variability in environmental satisfaction.

Table 2: Descriptive statistics (mean and standard deviation) for MIDAS, PHQ-9 and WHOQOL of Middle-Aged to Older adults

	Mean	Std. Deviation
MIDAS	17.75	33.22
PHQ	3.58	5.63
WHOQOL I	59.00	13.20
WHOQOL II	55.94	15.89
WHOQOL III	67.22	19.05
WHOQOL IV	65.72	11.36

SD = standard deviation

Table 3 represents that there is a significant positive correlation (0.419) between MIDAS and PHQ-9 scores, indicating that higher migraine-related disability is associated with higher levels of depressive symptoms in young to middle aged adults. It also shows significant negative correlations between MIDAS and WHOQOL I and II (-0.414,-0.380) which suggest that higher migraine-related disability is associated with poorer physical and psychological health. The weak or non-significant correlations with WHOQOL III and IV (-0.012, -0.132) indicate that migraines may have less impact on social relationships and environmental s8atisfaction. Moreover, it shows significant negative correlations between PHQ-9 and WHOQOL I and II (-0.485, -0.561) suggest that higher levels of depression are associated with poorer physical and psychological health. The weak negative correlations with WHOQOL III and IV (-0.117, -0.164) imply a less direct impact of depression on social and environmental satisfaction. Besides the above, the significant

positive correlations among WHOQOL domains (0.672 , 0.380 and 0.536) indicate that better physical health is associated with better psychological health, social relationships, and environmental satisfaction in young to middle aged adults.

Table 3: Relationship between MIDAS, PHQ-9 and WHOQOL scales of Young to middle aged adults

	MIDAS	PHQ-9	WHOQOL I	WHOQOL II	WHOQOL III	WHOQOL IV
MIDAS	0					
PHQ-9	0.419**	0				
WHOQOL I	-0.414**	-0.485**	0			
WHOQOL II	-0.380**	-0.561**	0.672**	0		
WHOQOL III	-0.012	-0.117	0.380**	0.432**	0	
WHOQOL IV	-0.132	-0.164	0.536**	0.560**	0.549**	0

**Significant at 0.01 level.

Table 4 reveals that MIDAS and PHQ-9 have a Pearson coefficient of 0.799 which shows strong positive correlation indicating that higher migraine-related disability is strongly associated with higher levels of depressive symptoms. It shows that there are negative correlations between MIDAS and all WHO-QOL domains (-0.525, -0.504, -0.393 and -0.388) suggest that higher migraine-related disability is associated with poorer quality of life across physical, psychological, social, and environmental domains among 41-65 years. Also, the negative correlations between PHQ-9 and all WHOQOL domains (-0.621, -0.570, -0.340 and -0.329) suggest that higher levels of depression are associated with poorer physical, psychological health, environment satisfaction and social ties. Besides the above, the significant positive correlations among WHOQOL domains (0.694,0.694 and 0.513) indicate that better physical health is associated with better psychological health, social relationships, and environmental satisfaction. Quality of life is multifaceted, and improvements in one domain often correlate with improvements in others.

Table 4: Relationship between MIDAS, PHQ-9 and WHOQOL scales of Middle-Aged to Older adults

	MIDAS	PHQ	WHOQOL I	WHOQOL II	WHOQOL III	WHOQOL IV
MIDAS	0					
PHQ	0.799**	0				
WHOQOL I	-0.525**	-0.621**	0			
WHOQOL II	-0.504**	-0.570**	0.694**	0		
WHOQOL III	-0.393*	-0.340*	0.694**	0.606**	0	
WHOQOL IV	-0.388*	-0.329	0.513**	0.650**	0.557**	0

*Significant at 0.05 level; **Significant at 0.01 level.

NOTE: The Raw scores of WHOQOL are converted to transformed scores as per the norms.

DISCUSSION

The present study has explored the relationship between migraine related disability, depressive symptoms and quality of life in adults. The results have shown that migraines are highly associated with depression in younger, middle and older adults. Buse shows the significant comorbidity rates of migraines and psychiatric illnesses, particularly depression, across different age groups, stressing the biopsychosocial variables at play (Buse et al., 2013) whereas Saunders says, while comorbid illnesses such as depression might aggravate migraine-related disability, good comorbidity care can reduce the effects on mental health

(Saunders et al., 2008). Migraines place a significant burden on people, including physical discomfort, emotional suffering, and functional impairment (Lipton et al., 2001).The severity and frequency of migraine attacks can impede everyday activities, work productivity, and social contacts, resulting in a significant drop in QoL whereas Campo reveals that not all children and adolescents with chronic health disorders, such as migraines, have depressed symptoms, implying the availability of resilience elements (Campo et al., 1999). While migraines pose a considerable health cost, not all migraine sufferers, particularly those with excellent coping techniques and treatment, experience depressed symptoms (Bigal et al., 2010)

We found that migraine and depression will affect one's quality of life in all aspects by limiting physical, psychological, social and environmental functioning. For younger adults, migraines depressive symptoms disrupt the developmental milestones such as academic achievement, social relations and establishing independence. It can also lead to feelings of loneliness and isolation eventually. Middle-aged individuals may have less energy, become more irritable, and struggle to manage daily responsibilities as taking care of the kids, or their parents and balancing their work life as well as their personal life, all of which led to a lower quality of life (Buse et al., 2013). The expenditures of treating chronic migraines and depression, such as drugs, medical visits, and missed workdays, quickly add up. This financial stress can further reduce quality of life (Blumenfeld et al., 2011). Multiple chronic health issues are common in older persons, which might interact with migraines and depression to worsen their quality of life. Comorbid disorders can raise the overall disease burden and require more healthcare (Saunders et al., 2008). Moreover, it also reduces mobility and independence in older adults.

Migraines have a major effect on quality of life across all age groups, emphasizing the compounded effect when depression is present (Lipton et al., 2001) whereas migraines are challenging, appropriate management and treatment can reduce their impact on quality of life, emphasizing the significance of proper medical care and support (Bigal et al., 2010). It can cause severe functional impairment, affecting job, family, and social life and this impairment can result in missed work days, lower productivity, and strained relationships, adding to the total cost of the disease for adults.

Our study had interrelations between WHOQOL domains. So, we can say that different aspects of quality of life are interrelated to each other. The factors that determine an individual's quality of life are their surroundings, education, occupation, housing, and health (Taşkapılıoğlu & Necdet, 2013). Migraine sufferers' quality of life is greatly reduced, as it affects many facets of everyday life such as social relationships, mental stability, and physical health. Regular and severe migraines can lead to severe physical pain, persistent discomfort, and disability that can make it difficult for a person to carry out everyday tasks, compromise their physical health, and degrade their quality of life (Lipton et al., 2007). They usually experience increased levels of stress, anxiety, and depression, which negatively affects their emotional health and overall quality of life (Smitherman et al., 2011).

According to a Saudi Arabian study, migraine sufferers had major reductions in their quality of life, especially challenges in continuing their social and professional routines (AlHarbi, 2020). Furthermore, a thorough analysis of migraine studies reveals a negative correlation between a higher frequency of headaches and a lower standard of life and health. This correlation highlights the significance of specific treatment regimens for those suffering from chronic migraines in order to enhance their general quality of life (Leonardi & Raggi, 2019). The intensity of migraine headaches ranges from mild discomfort that does not interfere with daily activities to excruciating pain that causes persistent incapacitation that significantly lowers quality of life (Anand & Sharma, 2007). The general quality of life, mental and emotional well-being, employment, family, and social life are all negatively impacted by migraines and it is associated with feelings of stigma, avoidance behaviour, dread, frustration, guilt, and isolation (Estave et al., 2021). Some

studies employing quality of life (QoL) measurements such as the Migraine-Specific Quality of Life Questionnaire (MSQ), those who suffer from migraines have much lower QoL scores than the general population (Bagley et al., 2012).

Younger adults frequently report a strong correlation between physical and mental health. Physical activity and fitness have a substantial impact on their mood and mental health, and vice versa. Positive physical health can improve psychological results by lowering stress, anxiety, and sadness. Social relationships are critical in this age group, as peer support and social activities are important for psychological well-being. Strong social bonds can buffer against stress and promote mental health, but poor social support can exacerbate psychological difficulties. The environment, which includes access to recreational amenities and safe neighbourhoods, can have an impact on physical health. A supportive atmosphere promotes physical activity and a healthy lifestyle, which improves general well-being (Schulte & Vainio, 2010). Numerous factors affect quality of life (QoL); if these elements are addressed, an individual's QoL may rise in a variety of ways (Zhang et al., 2018).

Chronic health problems in middle-aged adults can have a major impact on psychological well-being. The stress of managing chronic diseases such as migraines can cause melancholy and anxiety, which can worsen physical symptoms (Blumenfeld et al., 2011). Social ties frequently interact with the environmental realm. Conversely, a stressful work environment might have a negative impact on social interactions and psychological health (VanderWeele et al., 2012). Middle-aged persons in good mental health are more likely to have strong social networks, which give emotional support and improve quality of life (Blumenfeld et al., 2011). Middle-aged persons with excellent coping strategies may be able to retain their quality of life in the face of low environmental or social support conditions (Carver et al., 1989).

Physical health in older persons is intimately related to their surroundings. Access to healthcare services, safe housing, and community support can have a substantial impact on their physical health. Poor environmental circumstances can cause physical decline and lower quality of life. Older individuals' psychological health relies heavily on social assistance. Strong social networks can offer emotional support while reducing feelings of loneliness and sadness. Conversely, social isolation can have a harmful impact on mental health. In addition, the environment has an impact on older persons' psychological health. Living in a supportive, safe, and engaging setting can improve mental well-being, but living in hazardous or unstimulating environments can lead to mental health concerns. Research studies have indicated that migraines have a significant detrimental influence on many elements of QoL. Individuals with migraines had poorer scores in physical health, psychological well-being, social interactions, and environmental areas than those without migraines. Individuals who suffer from migraines may struggle to live an active and satisfying life due to the continual pain and impairment they experience (Lipton et al., 2001).

Inspite of migraines clearly causing many obstacles, migraineurs are able to lead a successful and balanced lives. Despite the considerable hardship that migraines cause on people, many persons with this condition exhibit great resilience and adaptability to manage their everyday lives. Our research has shown that, while migraines have a detrimental influence on quality of life (QoL) and give rise to depressive symptoms, a significant proportion of people manage to preserve their functional abilities and live satisfying lives. We have interestingly found that in South Indian Population, even though migraine affects quality of life, they are well adapted and have good functioning capabilities when compared to other populations.

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Data Availability
Upon a reasonable request, the corresponding author will provide the data sets utilized or analysed in the current study.

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