

# Research Paper: Relationship Between Psychological Symptoms, Age, Severity of Symptoms, and Societal Integration in Patients With Facial Nerve Paralysis



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## ABSTRACT

**Objectives:** Facial Nerve Paralysis (FNP) may cause disfigurement of the face, which result in psychological disturbances and isolation because of society's reaction to people's physical appearance. This study aimed to determine the relationship between psychological symptoms, age, the severity of symptoms, and societal integration in people with FNP.

**Methods:** The present research is a cross-sectional study involving patients with FNP approved by the research ethics committees of Kano State Ministry of Health and Aminu Kano Teaching Hospital. The instruments used in the study are Hospital Anxiety and Depression Scale (HADS) to assess psychological distress, House-Brackmann Scale (HBS) to assess the severity of facial nerve damage, and the Facial Nerve Palsy Integration Register (FAIR) to assess community integration of patients with FNP.

**Results:** Thirty-seven patients with FNP (16 males and 21 females) with the age range of 14 to 70 years participated in the current study. The findings of this study showed differences in societal integration between males and females (in favor of the males); the severity of FNP decreased as the societal integration of the patients increased, and as age increased, the societal integration decreased. Additionally, there was no difference in the integration between single and married ones. Furthermore, there was a significant positive correlation between depression and societal integration, but no significant correlation existed between anxiety and societal integration of the patients. Similarly, the findings showed a moderate negative significant correlation between the degree of disfigurement (severity) and societal integration of the patients.

**Discussion:** Women and older patients with FNP may have less community integration. However, Women may be less depressed than men since they have social contacts with both men and women.

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## Highlights

- Facial nerve injury causes disfigurement, and may consequently harm body image.
- People with facial nerve palsy may suffer from psycho-emotional problems such as depression, social isolation, and self-consciousness.
- Women with facial nerve palsy may be more vulnerable to social isolation and find it difficult to socialize as before the injury.
- Women with facial nerve palsy seem to be less depressed since they have contacts with both men and women.

## Plain Language Summary

Injury of the facial nerve that innervates the muscles of the face can result in the deviation of face to the other side, thus making the face look ugly. This problem can affect the way people, and especially women and young people, feel about themselves, resulting in depression and low self-esteem. In this study, we investigated the relationship between this problem and the patients' feeling about themselves and how they reintegrate into society. Based on the results, men socialize better than females and reintegrate into society faster. In addition, when facial nerve injury is severe, or the patient is old, the ability to integrate back into the community decreases. Also, when the patients are suffering from anxiety or their facial disfigurement is severe, their ability to reintegrate into society becomes very low. However, marital status did not have any significant relationship with the ability to reintegrate into society. Therefore, rehabilitation services for people with facial nerve injury should focus on the prevention or reduction of psycho-emotional problems and helping the patients to reintegrate into society.

### 1. Introduction

The face is an important part of the human body. It helps us to communicate to the outside world and expresses all our emotions and social and psychological functions [1, 2]. Through these emotions and functions, others can understand our intentions and behaviors. Also, people can recognize others through their facial appearances. Consequently, our faces look is associated with both how we value ourselves, and how people may perceive us. However, Facial Nerve Palsy (FNP) could affect the appearance of the face [3], and lead to psychological, social, and emotional disturbances in the patients. FNP affects the seventh Cranial Nerve (CN VII) known as facial nerve that innervates the muscles of the face, which enables voluntary and involuntary contractions of each side of the face [3, 4]. Injury to this nerve can paralyze the muscles it supplies. The most common cause of this paralysis is Bell's palsy [5], and the prevalence of FNP is 20 to 30 per 100000 people [6].

Impairment in function or structure of someone's face can result in lower social participation that be further confounded by environmental and personal factors (The International Classification of Functioning (ICF), Dis-

ability, and Health) [7]. Similarly, the deformation of the face after FNP may tend to interfere with the affected person's activities of daily living and social participation, leading to emotional and psychological disturbances [8-10]. Therefore, this study aimed to determine the relationship between psychological symptoms, age, the severity of symptoms, and societal integration in patients with FNP.

### 2. Methods

#### Study design

The present study had a cross-sectional design conducting on patients with FNP. The research ethics committees of Kano State Ministry of Health and Aminu Kano teaching Hospital approved this research.

#### Study participants

The study participants were patients diagnosed with FNP, who were receiving treatment at the outpatient units of physiotherapy departments at Aminu Kano Teaching Hospital, Murtala Muhammad Specialist Hospital, and Muhammad Abdullahi Wase Specialist Hospital in Kano metropolis. The participants were recruited, using purposive sampling technique. The inclusion criteria included patients with unilateral FNP, who were

≥18 years. The participants would be excluded if they had severe cognitive difficulties (scores ≥24 obtained on Mini-Mental State Examination).

The sample size was 96, calculated, using the formula:  $n = Z^2 \times p(1-p) / d^2$ . Therefore,  $n = 1.9^2 \times 0.5(1-0.5) / 0.1^2 = 3.8428 \times 0.5(0.5) / 0.01 = 3.842 \times 0.25 / 0.01 = 96$ , where  $p$  is the proportion or the best guess about the value of the proportion of interest. If no information were known about the  $p$ , then,  $p$  would be 0.5,  $d$  would be the tolerance, i.e. how close the proportion of interest is to the desired estimate (0.1) and  $Z$  would be 1.96 when the confidence level is 95%.

### Study outcomes

The study instruments were Hospital Anxiety and Depression Scale (HADS) to assess psychological distress, House-Brackmann Scale (HBS) to assess the severity of facial nerve damage, and the Facial Nerve Palsy Integration Register (FAIR) to assess community integration of patients with FNP. The HADS is a 14-item scale that generates ordinal data, in which 7 items relate to anxiety, and the other 7 relate to depression [11]. Each item on the questionnaire is scored from 0 to 3.

A score of 0 to 7 is normal, 8 to 10 is borderline abnormal, and 11 to 12 is abnormal. The HBS is a reliable scale that measures the degree of severity of nerve damage in FNP [12]. It grades facial function from 1 (normal) to 6 (complete paralysis). The scale has good psychometric properties, easy to use, and widely accepted in practice [13]. According to House and Brackmann, the scoring is determined by measuring the upward movement of the mid-portion of the top of the eyebrow and the outward

movements of the oral commissure [12]. One point is assigned for every 0.25cm upward motion to a maximum of 1cm. The sum of the scores for each structure gives the total HBS score. The maximum score that can be obtained is 8 if both the eyebrow and oral commissure move the full extent of 1cm.

The FAIR is a questionnaire that assesses the level of societal integration. It was designed by two authors (NMK & AA) and validated by experts in the Physiotherapy Department, Bayero University Kano. The questionnaire has two sections. Section A contains quantitative aspects of social integration with 13 questions scored on a 4-point ordinal scale from 0 to 3. The scoring is as follows: 0 (no integration), 1 to 13 (mild integration), 14 to 26 (moderate integration), and 27 to 39 (high integration). Section B of the questionnaire consists of questions that assess the qualitative aspect of societal integration. All the participants were assessed, using the HADS, HBS, and FAIR.

The participants were recruited between June 8, 2015, and July 24, 2015, and the data were collected between August 5, 2015, and November 23, 2015.

### Data analysis

The descriptive statistics of frequency and percentage were used to summarize the demographic data. The Spearman's rho correlation coefficient was used to determine the relationship between anxiety, depression, age of participants, the severity of symptoms, and social integration. Mann-Whitney U test was used to determine differences between men and women in anxiety, depression, and social integration. All analyses were performed in SPSS V. 16.

**Table 1.** Characteristics of the study participants

Variables		No.	%
Gender	Male	16	43.2
	Female	21	56.8
Religion	Islam	37	100
	Christianity	0	0.0
Marital status	Single	22	59.5
	Married	14	37.8
	Widow	0	0.0
	Divorced	1	2.7

### 3. Results

Only 37 participants (16 males and 21 females) with the age range of 14 to 70 years (out of the calculated sample size of 96) took part in the study. (Table 1) presents the details of the participants' characteristics.

The result of the study showed a weak negative significant correlation between age and integration ( $P=0.007$ ). There was a weak positive significant correlation ( $P=0.008$ ) between depression and integration. No significant relationship was observed between integration and anxiety ( $P=0.171$ ). There was a significant negative relationship between integration and severity of FNP ( $P=0.05$ ). (Table 2) presents the details of the results.

Furthermore, the result of the study showed a significant gender difference in integration. There was, however, no significant difference between single and married participants ( $P=0.358$ ). In addition, anxiety did not significantly differ between males and females. Also, there was a significant difference between males and females in depression. (Table 3) presents the details of the results.

### 4. Discussion

The findings of this study showed differences in societal integration between males and females (in favor of the males); the severity of FNP decreased as

societal integration of the patients increased, and as age increased, the societal integration decreased. Additionally, there was no difference in the integration between single and married ones. Furthermore, there was a significant positive correlation between depression and societal integration, but no significant correlation existed between anxiety and societal integration of the patients. Similarly, the study showed a moderate negative significant correlation between the degree of disfigurement (severity) and societal integration of the patients. This finding is in line with the study results of Bogart et al. Their findings showed that the inability to express oneself with the face (and having a facial difference) is particularly stigmatizing. It tempers with the patients' societal integrations and total isolation in a sample of adults with Moebius syndrome, a rare congenital condition characterized by facial paralysis [14].

The present study also found that males are more likely to become depressed than females. This finding is in contrast with the findings of previous studies, in which they reported that females have more psychological symptoms than males possibly owing to the greater emphasis placed on their appearance by both themselves and the society [15, 16]. The difference between the findings of the present study and those of the former could be attributed to the context of the present study. In the present study, female samples rarely leave the house compared to their male counterparts. Thus, they will be

**Table 2.** Presents relationship between the study variables and integration

Variables	Integration	Severity	Anxiety	Depression	Age
Integration			0.23		-0.04*
Severity	-0.32*				
Anxiety					
Depression	0.13*				
Age					

\* $P<0.05$

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**Table 3.** Gender differences in the study variables

Variables	Participants	Z	P
Integration	M(md=2.0, n=16), F(md=1.0, n=21)	-2.262	0.024*
Anxiety	M(md=2.5, n=16), F(md=3.0, n=21)	-1.243	0.214
Depression	M(md=3.0, n=16), F(md=2.0, n=21)	-2.152	0.031
Marital Status	S(md=1.0, n=16), MD(md=2.0, n=20)	-0.918	0.358

\*Significant difference

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F=Female; M=Male; md=Median; S=Single; and MD=Married

$P=0.05$  less likely to come across any depressing stimulus. Additionally, the culture seems to offer females special regard to dissipate their emotions. However, in terms of anxiety, there was no significant difference between males and females.

Regarding age and integration, there was a significant negative correlation between the two variables. Cross et al. found a significant negative correlation between levels of distress, which leads to low integration and age in a sample of patients with FNP following acoustic neuroma surgery [17]. This result is in contrast with the finding of this study, where a significant negative correlation exists between age and social integration of the patients. However, the significant negative correlation between age and integration could be because, in old age, people tend to reduce their social participation.

Regarding marital status, there was no significant difference between single and married participants in terms of their integrating into society. This result may be due to the limited number of samples or great support from their family. Sarkisian and Gerstel reported that single individuals have greater involvement with the larger community [18]. However, in the context of this research, factors such as greater values for married people can give them an equal advantage like single people regarding their involvement in community activities. With regard to depression, anxiety, and societal integration, our study found a significant positive correlation between depression and integration of the patients and a negative non-significant correlation between anxiety and integration.

These findings contrast with the findings of other studies, which reported that psychological symptoms hamper with the integration of FNP patients [14, 19-21]. This difference in the findings may be related to the new scale used in measuring the societal integration of FNP patients in our study. Integration is important for the healing process, as psychosocial support can prevent a patient from distress that may slow down the progress of rehabilitation. This study is, however, limited by the different etiologies of FNP in the study participants, since no difference in the outcomes of interest between the different causes was looked at. This limitation may affect the external validity of the study findings.

## 5. Conclusions

People with nerve palsy, especially the older patients and women, may be more likely to have problems with community integration. As a result, females may be less

depressed than males since they have lower social contacts with others than their male counterparts. Thus, it is recommended that the rehabilitation of people with FNP should have a special focus on societal or community re-integration and management of any psychosocial symptoms associated with the condition.

## Ethical Considerations

### Compliance with ethical guidelines

The study complied with the ethical guidelines of the hospital where the data was collected in terms of maintaining participants' privacy, seeking their consent and legal framework that enabled (NMK) collected the data.

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### Authors' contributions

All authors contributed equally in preparing this article.

### Conflict of interest

The authors declared no conflict of interest.

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