

# Gender differences in quality of life among Bell's palsy patients: a cross-sectional study

## Diferenças entre gêneros na qualidade de vida entre pacientes com paralisia de Bell: um estudo transversal

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**ABSTRACT | BACKGROUND:** Functional and psychosocial consequences are reported to be associated with Bell's palsy. Quality outcomes in bell's palsy could be influenced by the sociodemographic factors in males and females, but their predicting factors are scantily reported. This study is designed to compare the quality outcomes in males and females with Bell's palsy. **METHODS:** Non-probability sampling and a convenient method were used to recruit 196 participants in this cross-sectional study. The study protocol followed the STROBE guidelines and the institutional review board approval for the study was obtained. Participants are screened for eligibility prior to enrollment. The data collection form is used to get the participant characteristics. The facial disability index and World Health Organization Quality of life Brief version (WHO QOL BREF) are used to assess the quality outcomes. **RESULTS:** Chi-square statistics for the sociodemographic data in males and females were significant for the type of employment ( $\chi < 0.001$ ). Unpairedt-testt analysis showed significant differences ( $P < 0.05$ ) in the mean scores of the physical and social component of the facial disability index and physiological, environmental, and overall components of WHOQOL BREF indicating that females are affected more than males. Further regression analysis revealed a significant association for a higher level of education ( $\beta = 2.77$ , CI = 0.52 to 5.02,  $P = 0.046$ ) and private employment ( $\beta = 4.30$ , CI = 0.06 to 8.54,  $P = 0.047$ ) with poor quality outcomes in females. **CONCLUSION:** Quality of life is affected more in females with Bell's palsy and the predicting factors are higher levels of education and employment in private organizations. Longer duration of symptoms predicted poor quality in both males and females.

**KEYWORDS:** Facial Paralysis. Quality of Life. Gender Differences.

**RESUMO | INTRODUÇÃO:** Relata-se que as consequências funcionais e psicossociais estão associadas à paralisia de Bell. Os resultados de qualidade na paralisia de Bell podem ser influenciados pelos fatores sociodemográficos em homens e mulheres, mas seus fatores preditivos são pouco relatados. Este estudo foi desenvolvido para comparar os resultados de qualidade em homens e mulheres com paralisia de Bell. **MÉTODOS:** Amostragem não probabilística e método conveniente foram utilizados para recrutar 196 participantes neste estudo transversal. O protocolo do estudo seguiu as diretrizes STROBE e a aprovação do conselho de revisão institucional para o estudo foi obtida. Os participantes são selecionados quanto à sua elegibilidade antes da inscrição. O formulário de coleta de dados é utilizado para obter as características dos participantes. O índice de incapacidade facial e a versão resumida da qualidade de vida da Organização Mundial da Saúde (WHO QOL BREF) são usados para avaliar os resultados de qualidade. **RESULTADOS:** As estatísticas do qui-quadrado para os dados sociodemográficos em homens e mulheres foram significativas para o tipo de emprego ( $\chi < 0.001$ ). A análise do teste t não pareado mostrou diferenças significativas ( $P < 0.05$ ) nos escores médios dos componentes físico e social do índice de incapacidade facial e dos componentes fisiológicos, ambientais e gerais do WHOQOL BREF, indicando que as mulheres são mais afetadas que os homens. Análises de regressão adicionais revelaram associação significativa para maior nível de escolaridade ( $\beta = 2,77$ , CI = 0,52 a 5,02,  $P = 0,046$ ) e emprego privado ( $\beta = 4,30$ , CI = 0,06 a 8,54,  $P = 0,047$ ) com resultados de baixa qualidade em mulheres. **CONCLUSÃO:** A qualidade de vida é mais afetada em mulheres com paralisia de Bell e os fatores preditivos são maior nível de escolaridade e emprego em organizações privadas. A maior duração do sintoma previu má qualidade em homens e mulheres.

**PALAVRAS-CHAVE:** Paralisia Facial. Qualidade de Vida. Diferenças de Gênero.

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## 1. Introduction

More than identity, the face plays a crucial role in communication and it also reflects the individual's sense of oneself. Facial expressions are fundamental for the extraction and transmission of information during a conversation. The concern for physical appearance and aesthetics is increasingly common nowadays.<sup>1</sup>

Bell's palsy is a non-progressive neurological condition characterized by seventh cranial nerve paralysis and facial muscle paralysis on one side of the face.<sup>1,2</sup> Bell's palsy impairments occur due to the lesion in the facial nerve at any one of its branches at intracranial, infratemporal and extratemporal levels.<sup>2</sup> Facial nerve has motor, sensory and parasympathetic functions over the face. The functional problems associated with facial impairments are difficulty in chewing, drinking, swallowing, speaking, smiling, blinking eyes, and other facial expression activities that could distress the individual resulting in anxiety, irritability and affect their psychological status.<sup>3</sup> Although the spontaneous recovery occurs within 3 weeks in Bell's palsy patients, there is always a risk of residual paresis and associated facial impairment following recovery.<sup>4</sup> Residual facial impairment is quite disfiguring and it is estimated that approximately 29% of Bell's palsy patients develop residual hemifacial impairments.<sup>5</sup> Synkinesia, a form of abnormal movement occurs with Bell's palsy patients with poor prognosis and facial impairments. Despite the type of prognosis, facial impairments associated with Bell's palsy could negatively impact the patient's quality of life throughout its course.<sup>1</sup>

Individuals with facial impairments perceive their body image negatively, added with their poor prognosis, and they tend to withdraw themselves from social / community participation activities.<sup>2,5</sup> It is evident that body image dissatisfaction leads to several negative health outcomes and psychopathological states such as depression and low mood status in these individuals.<sup>4</sup> Thus the facial deficits in Bell's palsy could potentially influence the biopsychosocial aspects of an individual.

Although the condition is self-limiting and spontaneously recovers in the majority of the

individuals, several independent factors are associated with the biopsychosocial adverse effect of facial impairment in Bell's palsy. Age, level of education, type of occupation, location of residence, and marital status are some of the factors that potentially could affect the biopsychosocial wellness in Bell's palsy individuals. In a recent study by Bylund et al.<sup>6</sup> it is reported that facial impairments of Bell's palsy are associated with psychosocial functions in the majority of the participants. In a cross-sectional study<sup>7</sup> the authors reported significant levels of psychological distress in Bell's palsy patients. In a case-control study from China, the authors concluded a strong association of psychological distress in Bell's palsy patients.<sup>8</sup>

In patients with poor prognosis and with chronicity of the condition, the mechanism disturbing their biopsychosocial wellness is described by the illness intrusiveness phenomenon.<sup>9</sup> Illness intrusiveness are illness-induced disruptions to performing routine lifestyle activities that can compromise psychosocial well-being and contribute to emotional stress.<sup>10,11</sup>

In Bell's palsy, the biopsychosocial disturbances could hamper the quality of life of individuals. Quality of life is characterized by four domains such as physical, psychological, social and environmental. The quality of life of an individual with Bell's palsy is determined by his sociodemographic, clinical and psychosocial factors.<sup>12</sup> In the clinical practice guidelines published by the American Academy of Neurology and the American Academy of Otolaryngology – Head and Neck Surgery Foundation (AAO-HNSF)<sup>13</sup> the strategies to improve quality of life in Bell's palsy patients are not clearly reported.

There is a need for identifying gender differences in biopsychosocial and wellness aspects in individuals with Bell's palsy. The results of the study could identify the most affected quality of life component in Bell's palsy to help the clinicians and rehabilitation professionals for screening and to provide interventions accordingly. The present study aims to analyze the association of sociodemographic variables in quality of life among males and females with the diagnosis of Bell's palsy. The study is also hypothesized to test the gender differences in quality of life among Bell's palsy individuals.

## 2. Methods

This cross-sectional study is conducted according to STROBE guidelines for cross-sectional design. The study protocol was approved (ACP/OP/2023/OL42) by the institutional review board of Alva's College of Physiotherapy and Research Centre, Moodbidri, DK, Karnataka, India. The study was registered in the Clinical Trial Registry of India (CTRI/2024/04/066270). G\*power statistical application is used to estimate the sample size. Based on a previous study<sup>14</sup> findings and power analysis using a priori computed with two tails, ratio of variances (0.749), alpha error probability (0.05) and power (0.80) parameters, the estimated sample size for the study is 196 participants. Through non-probability and convenience sampling methods, the eligible participants were recruited from 14 hospitals in Dakshina Kannada district, Karnataka. The diagnosis of Bell's palsy is confirmed by a qualified neurologist or a general physician. Qualified Physiotherapy professionals in those hospitals were trained for screening and data collection processes. The data-collecting personnel were supervised by the authors of the study.

Both genders, aged from 21 to 60 years, with idiopathic Bell's palsy, lower etiology from motor neuron lesion, and one-sided facial weakness with no sparing of forehead muscles are considered for inclusion. Participant presenting with bilateral facial weakness, Bell's palsy secondary to other pathologies, bell's palsy associated with any other comorbid conditions, recurrent Bell's palsy, with history of any form of disabilities or deformities, with history of previous psychiatric illness and not willing to participate were excluded from the study. Participants fulfilling the selection criteria were explained about the study protocol and their consent was obtained. Participants' characteristics and quality of life were the data collected from the participants (Details enclosed in [Appendix I](#): Data collection form).

### 2.1 Participant characteristics

A standard data collection form is used to collect data from all the respondents. The characteristics of respondents collected were gender, age, marital status, educational qualification, employment status, location of residence, date of diagnosis of Bell's palsy, duration of days from the onset of Bell's palsy symptom, comorbid illness and its duration.

### 2.2 Quality of life

The facial disability index and WHO QOL BREF questionnaires were the quality of life scales administered to all the enrolled participants.

#### 2.2.1 WHO QOL BREF measure

It is cross-culturally valid, reliable, and available in over 40 languages. It measures the quality of life through individual domains such as physiological, psychological, environmental, social, and overall. The mean score is calculated from each domain and multiplied by 4 to make it comparable to the WHO QOL 100 version. It measures quality outcomes in the general population and individuals with disabling conditions. It is considered an alternative to WHO QOL 100, which is lengthy and time-consuming to administer.<sup>15</sup>

#### 2.2.2 Facial disability index measure

It is a facial neuromuscular system disorder-specific, self-report instrument measuring disabilities through physical, social, and overall components. The score for each component in the facial disability index was calculated according to the number of questions answered and the raw score for each question. The overall scores ranged from 0 (worst) to 100 (better). It is Psychometrically proven and easy to administer in Bell's palsy individuals.<sup>16</sup>

Trained data collectors ensured the completeness of both the self-reported measures from all the participants.

### 2.3 Statistical analysis

The collected data were analyzed using Statistical Package for Social Sciences software (version 26.0. Armonk, NY: IBM Corp). Descriptive statistical analysis was performed for participant's characteristics such as age, marital status, education status, employment status, location of residence and duration from the onset of Bell's palsy symptom. An Independent t-test is performed to compare the mean and standard deviation of all the components of the facial disability index and WHO QOL BREF outcomes in males and females. Multiple logistic regression is performed to analyze the influence of demographic characteristics on quality of life outcome.

### 3. Results

#### 3.1 Participant characteristics

A total of 196 Bell's palsy individuals enrolled in this study from multi-centers in Dakshina Kannada. Both male (n = 91) and female (n = 105) subjects were included in this study. The age criteria for participants included in this study varied from 21 to 75 years and the majority of the participants, 67.34% (n = 132) belong to 41 to 60 years of age. The majority of the participants (Males = 78, Females = 84) with Bell's palsy were married. Male Bell's palsy individuals had a similar proportion for educational categories such as no education, elementary, higher secondary and college level education, compared to the majority of females with Bell's palsy with higher education qualifications. The majority of the males 48.35% (n = 44) were employed in the government sector whereas in females 45.71% (n = 48) were unemployed. Most of the participants are from rural (males = 55, females = 64) place and in the duration of Bell's palsy at the time of data collection was 1 - 2 weeks in both genders (males = 77, females = 93). The chi-square statistical analysis for the demographic characteristics of Bell's palsy participants were significant in education (P = 0.015) and employment (P = 0.000) characteristics (table 1).

**Table 1.** Gender-wise categorization of sociodemographic characteristics of participants with Bell's palsy

| Demographic       |               | Male                   | Female                 | $\chi^2$ |
|-------------------|---------------|------------------------|------------------------|----------|
|                   |               | Frequency (Percentage) | Frequency (Percentage) |          |
| Age               | 21-40         | 24 (24.1%)             | 28 (25%)               | 0.692    |
|                   | 41-60         | 60 (69.1%)             | 72 (65.7%)             |          |
|                   | > 61          | 7 (6.6%)               | 5 (9.2%)               |          |
| Marital status    | Single        | 7 (16.6%)              | 17 (7.8%)              | 0.149    |
|                   | Married       | 78 (80.0%)             | 84 (84.2%)             |          |
|                   | Widow         | 6 (3.3%)               | 4 (7.8%)               |          |
| Education status  | Uneducated    | 22 (25.8%)             | 26 (24.76%)            | 0.015    |
|                   | Elementary    | 25 (9.1%)              | 8 (7.6%)               |          |
|                   | Higher sec.   | 27 (30%)               | 32 (30.47%)            |          |
|                   | College       | 17 (35%)               | 39 (37.14%)            |          |
| Employment status | Unemployed    | 17 (18.68%)            | 48 (45.71%)            | 0.000*   |
|                   | Self employed | 25 (27.47%)            | 53 (50.47%)            |          |
|                   | Private       | 5 (5.49%)              | 4 (3.80%)              |          |
|                   | Government    | 44 (48.35%)            | 0 (0%)                 |          |
| Location          | Rural         | 55 (60.43%)            | 64 (60.95%)            | 0.942    |
|                   | Urban         | 36 (39.56%)            | 41 (39.04%)            |          |
| Duration          | 1-2 weeks     | 77 (84.61%)            | 93 (88.57%)            | 0.415    |
|                   | >2 weeks      | 14 (15.38%)            | 12 (11.42%)            |          |

Source: the authors (2024).

### 3.2 The gender-wise difference in Facial disability index and WHOQOL – BREF outcomes

Facial disability index and WHOQOL – BREF mean scores were compared between genders using independent t-tests. The mean of physical ( $56.76 \pm 26.1$ ) and social component ( $45.02 \pm 8.5$ ) of facial disability index were significantly ( $P < 0.05$ ) lower in females compared to males. The mean of WHOQOL – BREF outcome in environmental ( $25.31 \pm 3.8$ ) and overall components ( $6.99 \pm 2.0$ ) were lower in females indicating a significant difference between the genders (table 2).

**Table 2.** Gender wise comparison of FDI and WHOQOL-BREF

| Outcome     |               | Male   |       |    | Female |       |     | Significance |
|-------------|---------------|--------|-------|----|--------|-------|-----|--------------|
|             |               | M      | SD    | N  | M      | SD    | N   |              |
| FDI         | Physical      | 64.67  | 25.19 | 91 | 56.76  | 26.14 | 105 | 0.033*       |
|             | Social        | 48.48  | 10.61 | 91 | 45.02  | 8.54  | 105 | 0.012*       |
|             | Overall       | 113.15 | 28.42 | 91 | 117.39 | 22.90 | 105 | 0.250        |
| WHOQOL-BREF | Physical      | 21.70  | 3.32  | 91 | 20.61  | 4.12  | 105 | 0.046*       |
|             | Psychological | 16.04  | 2.80  | 91 | 15.00  | 3.51  | 105 | 0.025        |
|             | Social        | 9.85   | 1.88  | 91 | 9.22   | 2.36  | 105 | 0.043        |
|             | Environmental | 26.50  | 3.27  | 91 | 25.31  | 3.84  | 105 | 0.022*       |
|             | Overall       | 7.75   | 1.75  | 91 | 6.99   | 2.02  | 105 | 0.005*       |

Source: the authors (2024).

### 3.3 Association between gender and quality of life

After controlling sociodemographic variables, the multiple regression analysis was conducted between gender and quality of life (facial disability index and WHOQOL – BREF outcomes). The physical component outcomes of facial disability index ( $P = 0.012$ ,  $\beta = 8.486$ , CI = 1.856 to 15.117) and WHOQOL – BREF ( $P = 0.000$ ,  $\beta = 2.639$ , CI = 1.631 to 3.647) were significantly correlated with female gender (table 3 and 4).

**Table 3.** Gender-wise difference in quality of life (FDI)

|        | FDI      |       |       |                 |        |       |       |                  |         |       |       |                  |
|--------|----------|-------|-------|-----------------|--------|-------|-------|------------------|---------|-------|-------|------------------|
|        | Physical |       |       |                 | Social |       |       |                  | Overall |       |       |                  |
|        | B        | SE    | p     | CI              | B      | SE    | P     | CI               | B       | SE    | p     | CI               |
| Female | 8.486    | 3.362 | 0.012 | 1.856 to 15.117 | -3.391 | 1.355 | 0.013 | -6.023 to -0.720 | 5.095   | 3.751 | 0.176 | -2.303 to 12.494 |
| Male   | Ref      |       |       |                 | Ref    |       |       |                  | Ref     |       |       |                  |

Source: the authors (2024).

**Table 4.** Gender-wise difference in quality of life (WHOQOL-BREF)

| WHOQOL-BREF |          |       |      |                |               |       |       |                 |             |       |       |               |        |       |       |                |         |       |       |                  |
|-------------|----------|-------|------|----------------|---------------|-------|-------|-----------------|-------------|-------|-------|---------------|--------|-------|-------|----------------|---------|-------|-------|------------------|
|             | Physical |       |      |                | Psychological |       |       |                 | Environment |       |       |               | Social |       |       |                | Overall |       |       |                  |
|             | B        | SE    | P    | CI             | B             | SE    | p     | CI              | B           | SE    | p     | CI            | B      | SE    | p     | CI             | B       | SE    | p     | CI               |
| Female      | 2.639    | 0.511 | .000 | 1.631 to 3.647 | 0.297         | 0.404 | 0.491 | -0.518 to 1.076 | 0.945       | 0.491 | 0.056 | .024 to 1.914 | 0.594  | 0.273 | 2.177 | 0.056 to 1.133 | -0.637  | 0.281 | 0.025 | -1.191 to -0.082 |
| Male        | Ref      |       |      |                | Ref           |       |       |                 | Ref         |       |       |               | Ref    |       |       |                | Ref     |       |       |                  |

Source: the authors (2024).

### 3.4 Factors predicting and protecting poor quality of life outcomes in both genders

Bell's palsy males in the age group from 21 to 40 years ( $\beta = -7.85$ , CI = -13.281 to -2.430, P = 0.005) and from 41 to 60 years ( $\beta = -6.54$ , CI = -11.562 to -1.529, P = 0.011) are protective against poor quality outcomes in physiological component of WHOQOL BREF.

In elementary-level education males are protected against higher scores ( $\beta = -14.71$ , CI = -29.19 to -0.24, P = 0.046) in the overall component of facial disability index. College-level education in females, significantly predicted ( $\beta = 2.77$ , CI = 0.52 to 5.02, P = 0.046) the higher scores in environmental component of WHOQOL BREF scale.

Females working in the private sector are associated with higher odds of scoring poor outcomes in the physiological component ( $\beta = 4.30$ , CI = 0.06 to 8.54, P = 0.047) of WHOQOL BREF. Whereas males working in private sectors are protected from low scores in physical ( $\beta = -26.77$ , CI = -52.20 to -1.35, P = 0.039) and overall ( $\beta = -32.40$ , CI = -60.96 to -3.84, P = 0.027) component in facial disability index. Similarly, the self-employed males had an inverse association ( $\beta = -2.47$ , CI = -4.73 to -0.22, P = 0.031) with the psychological component of WHOQOL BREF outcome (table 5,6,7,8).

**Table 5.** Quality of life in females (FDI)

| FDI                |                | Physical |      |              |                   | Social  |     |       |                    | Overall |      |              |                    |
|--------------------|----------------|----------|------|--------------|-------------------|---------|-----|-------|--------------------|---------|------|--------------|--------------------|
|                    |                | B        | SE   | P            | CI                | B       | SE  | P     | CI                 | B       | SE   | P            | CI                 |
| AGE                | 21 – 40 years  | - 7.58   | 16.3 | 0.644        | - 40.06 to 24.89  | -1.46   | 6.0 | 0.809 | - 13.457 to 10.527 | 2.359   | 14.5 | 0.872        | -26.564 to 31.283  |
|                    | 41 – 60 years  | - 14.41  | 15.1 | 0.343        | - 44.45 to 15.62  | 2.28    | 5.5 | 0.684 | - 8.808 to 13.369  | - 2.90  | 13.4 | 0.830        | -29.648 to 23.841  |
|                    | Above 61 years | 1        |      |              |                   | 1       |     |       |                    | 1       |      |              |                    |
| MARITAL STATUS     | Married        | 19.64    | 16.5 | 0.239        | - 13.26 to 52.56  | - 1.69  | 6.1 | 0.783 | - 13.846 to 10.458 | - 5.29  | 14.7 | 0.721        | - 34.606 to 24.013 |
|                    | Widow          | 1        |      |              |                   | 1       |     |       |                    | 1       |      |              |                    |
|                    | Single         | 25.73    | 18.5 | 0.169        | - 11.16 to 62.62  | 3.58    | 6.8 | 0.602 | - 10.032 to 17.210 | 0.63    | 16.5 | 0.970        | -32.220 to 33.485  |
| EDUCATIONAL STATUS | Uneducated     | 1        |      |              |                   | 1       |     |       |                    | 1       |      |              |                    |
|                    | Elementary     | - 1.60   | 9.7  | 0.869        | - 20.92 to 17.71  | - 1.66  | 3.5 | 0.645 | - 8.794 to 5.471   | 10.71   | 8.6  | 0.219        | - 6.493 to 27.914  |
|                    | Higher sec.    | - 0.29   | 10.0 | 0.977        | - 20.22 to 19.64  | 0.93    | 3.7 | 0.801 | - 6.424 to 8.294   | 12.35   | 8.9  | 0.17         | - 5.398 to 30.10   |
|                    | College        | - 1.34   | 9.9  | 0.893        | - 21.01 to 18.33  | 0.18    | 3.6 | 0.959 | - 7.075 to 7.451   | 16.81   | 8.8  | 0.06         | - 0.700 to 34.33   |
| EMPLOYMENT STATUS  | Unemployed     | 1        |      |              |                   | 1       |     |       |                    | 1       |      |              |                    |
|                    | Self employed  | -3.64    | 5.7  | 0.529        | - 15.11 to 7.82   | 1.38    | 2.1 | 0.518 | - 2.850 to 5.620   | 0.58    | 5.1  | 0.909        | -9.629 to 10.803   |
|                    | Private        | -0.07    | 12.7 | 0.996        | - 25.43 to 25.29  | 2.54    | 4.7 | 0.590 | - 6.818 to 11.911  | -8.48   | 11.3 | 0.458        | -31.071 to 14.102  |
| LOCATION STATUS    | Urban          | 1        |      |              |                   | 1       |     |       |                    | 1       |      |              |                    |
|                    | Rural          | 6.880    | 5.4  | 0.213        | - 4.020 to 17.780 | 1.87    | 2.0 | 0.357 | - 2.150 to 5.899   | 4.49    | 4.8  | 0.314        | - 4.760 to 14.652  |
| DURATION STATUS    | < 2 weeks      | Ref      |      |              |                   | 1       |     |       |                    | 1       |      |              |                    |
|                    | >2 weeks       | 37.447   | 7.5  | <b>0.000</b> | 22.470 to 52.424  | - 0.270 | 2.7 | 0.923 | - 5.799 to 5.259   | 29.14   | 6.7  | <b>0.000</b> | 15.810 to 42.482   |

Source: the authors (2024).

**Table 6.** Quality of life in females (WHOQOL-BREF)

| WHOQOL-BREF        |                | Physiological |     |              |                  | Psychological |     |       |                 | Environmental |     |              |                 | Social |     |              |                 | Overall |     |       |                 |
|--------------------|----------------|---------------|-----|--------------|------------------|---------------|-----|-------|-----------------|---------------|-----|--------------|-----------------|--------|-----|--------------|-----------------|---------|-----|-------|-----------------|
|                    |                | B             | SE  | P            | C I              | B             | SE  | P     | C I             | B             | SE  | P            | C I             | B      | SE  | P            | C I             | B       | SE  | P     | C I             |
| AGE                | 21 – 40 years  | -2.96         | 1.7 | 0.097        | -6.47 to 1.41    | -0.03         | 1.4 | 0.983 | -2.95 to 2.88   | -1.14         | 1.6 | 0.493        | -4.446 to 2.161 | 1.00   | 0.9 | 0.317        | -0.980 to 2.985 | -0.85   | 0.9 | 0.370 | -2.728 to 1.026 |
|                    | 41 – 60 years  | -1.80         | 1.6 | 0.268        | -5.03 to 1.41    | 0.23          | 1.3 | 0.864 | -2.44 to 2.91   | -0.64         | 1.5 | 0.675        | -3.673 to 2.392 | 0.48   | 0.9 | 0.601        | -1.339 to 2.300 | -0.76   | 0.8 | 0.378 | -2.490 to 0.956 |
|                    | Above 61 years | 1             |     |              |                  | 1             |     |       |                 | 1             |     |              |                 | 1      |     |              |                 | 1       |     |       |                 |
| MARITAL STATUS     | Single         | 4.95          | 3.1 | 0.114        | -1.211 to 11.113 | -1.68         | 2.8 | 0.556 | -7.335 to 3.967 | -2.27         | 3.0 | 0.463        | -8.395 to 3.853 | 3.57   | 1.8 | 0.053        | -0.047 to 7.198 | -0.26   | 1.6 | 0.872 | -3.477 to 2.956 |
|                    | Married        | 1.95          | 2.7 | 0.482        | -3.545 to 7.450  | -2.18         | 2.5 | 0.392 | -7.224 to 2.860 | -1.54         | 2.7 | 0.575        | -7.012 to 3.915 | 2.50   | 1.6 | 0.127        | -0.725 to 5.739 | 0.488   | 1.4 | 0.736 | -2.382 to 3.357 |
|                    | Widow          | 1             |     |              |                  | 1             |     |       |                 | 1             |     |              |                 | 1      |     |              |                 | 1       |     |       |                 |
| EDUCATIONAL STATUS | Uneducated     | 1             |     |              |                  | 1             |     |       |                 | 1             |     |              |                 | 1      |     |              |                 | 1       |     |       |                 |
|                    | Elementary     | -1.46         | 1.6 | 0.370        | -4.692 to 1.762  | 1.29          | 1.4 | 0.388 | -1.667 to 4.252 | 0.73          | 1.6 | 0.651        | -2.474 to 3.940 | 0.457  | 0.9 | 0.634        | -1.440 to 2.354 | -0.69   | 0.8 | 0.415 | -2.378 to 0.990 |
|                    | Higher sec.    | -1.89         | 1.6 | 0.262        | -5.219 to 1.439  | 2.00          | 1.5 | 0.196 | -1.050 to 5.057 | 0.86          | 1.6 | 0.60         | -2.443 to 4.174 | 0.016  | 0.9 | 0.987        | -1.941 to 1.973 | -1.26   | 0.8 | 0.151 | -3.006 to 0.470 |
|                    | College        | -0.22         | 1.2 | 0.850        | -2.61 to 2.16    | 1.23          | 0.9 | 0.219 | -0.75 to 3.22   | 2.77          | 1.1 | <b>0.016</b> | 0.52 to 5.02    | -0.17  | 0.6 | 0.797        | -1.523 to 1.173 | 0.14    | 0.6 | 0.828 | -1.137 to 1.417 |
| EMPLOYMENT STATUS  | Unemployed     | 1             |     |              |                  | 1             |     |       |                 | 1             |     |              |                 | 1      |     |              |                 | 1       |     |       |                 |
|                    | Self employed  | 1.49          | 0.9 | 0.126        | -0.426 to 3.406  | -0.70         | 0.8 | 0.425 | -2.466 to 1.048 | 0.78          | 0.9 | 0.415        | -1.119 to 2.689 | -0.36  | 0.5 | 0.525        | -1.489 to 0.764 | -0.14   | 0.5 | 0.782 | -1.140 to 0.860 |
|                    | Private        | 4.30          | 2.1 | <b>0.047</b> | 0.067 to 8.540   | -0.45         | 1.9 | 0.818 | -4.337 to 3.434 | 0.77          | 2.1 | 0.716        | -3.435 to 4.985 | -0.81  | 1.2 | 0.520        | -3.301 to 1.680 | 0.59    | 1.1 | 0.597 | -1.620 to 2.803 |
| LOCATION STATUS    | Rural          | 1             |     |              |                  | 1             |     |       |                 | 1             |     |              |                 | 1      |     |              |                 | 1       |     |       |                 |
|                    | Urban          | 0.05          | 0.9 | 0.951        | -1.765 to 1.877  | -0.31         | 0.8 | 0.709 | -1.984 to 1.355 | -1.02         | 0.9 | 0.265        | -2.330 to 2.641 | -0.22  | 0.5 | 0.678        | -1.295 to 0.846 | 0.28    | 0.4 | 0.559 | -0.670 to 1.231 |
| DURATION STATUS    | < 2 weeks      | 1             |     |              |                  | 1             |     |       |                 | 1             |     |              |                 | 1      |     |              |                 | 1       |     |       |                 |
|                    | >2 weeks       | 2.69          | 1.2 | <b>0.035</b> | 0.194 to 5.197   | 0.98          | 1.1 | 0.397 | -1.310 to 3.278 | 0.15          | 1.2 | 0.901        | -2.330 to 2.641 | 1.87   | 0.7 | <b>0.013</b> | 0.402 to 3.343  | -0.62   | 0.6 | 0.345 | -1.930 to 0.681 |

Source: the authors (2024).



Table 7. Quality of life in males (FDI)

| FDI                |                | Physical |      |              |                   | Social  |     |       |                 | Overall |      |              |                   |
|--------------------|----------------|----------|------|--------------|-------------------|---------|-----|-------|-----------------|---------|------|--------------|-------------------|
|                    |                | B        | SE   | P            | CI                | B       | SE  | P     | CI              | B       | SE   | P            | CI                |
| AGE                | 21 – 40 years  | 6.10     | 11.1 | 0.584        | - 16.00 to 28.212 | - 10.10 | 5.4 | 0.068 | - 20.98 to 0.77 | - 3.99  | 12.4 | 0.749        | - 28.83 to 20.83  |
|                    | 41 – 60 years  | 8.50     | 10.1 | 0.407        | - 11.78 to 28.80  | - 8.74  | 5.0 | 0.085 | - 18.72 to 1.24 | - 0.23  | 11.4 | 0.984        | - 23.03 to 22.56  |
|                    | Above 61 years | 1        |      |              |                   | 1       |     |       |                 | 1       |      |              |                   |
| MARITAL STATUS     | Married        | 4.91     | 10.9 | 0.656        | - 16.95 to 26.77  | 4.40    | 5.4 | 0.457 | - 6.71 to 14.80 | 8.95    | 12.3 | 0.470        | - 15.60 to 33.51  |
|                    | Widow          | 1        |      |              |                   | 1       |     |       |                 | 1       |      |              |                   |
|                    | Single         | 16.42    | 13.2 | 0.217        | - 9.86 to 42.70   | 8.40    | 6.4 | 0.199 | - 4.52 to 21.34 | 24.83   | 14.8 | 0.098        | - 4.69 to 54.35   |
| EDUCATIONAL STATUS | Uneducated     | 1        |      |              |                   | 1       |     |       |                 | 1       |      |              |                   |
|                    | Elementary     | - 12.27  | 6.4  | 0.062        | - 25.16 to 0.61   | - 2.44  | 3.1 | 0.446 | - 8.78 to 3.90  | - 14.71 | 7.2  | 0.046        | - 29.19 to - 0.24 |
|                    | Higher sec.    | - 2.80   | 7.3  | 0.704        | - 17.42 to 11.82  | 1.41    | 3.6 | 0.697 | - 5.78 to 8.61  | - 1.38  | 8.2  | 0.867        | - 17.81 to 15.04  |
|                    | College        | - 2.01   | 7.5  | 0.791        | - 17.05 to 13.02  | 5.81    | 3.7 | 0.122 | - 1.58 to 13.21 | 3.79    | 8.4  | 0.656        | - 13.09 to 20.69  |
| EMPLOYMENT STATUS  | Unemployed     | 1        |      |              |                   | 1       |     |       |                 | 1       |      |              |                   |
|                    | Self employed  | 6.66     | 8.5  | 0.439        | -10.39 to 23.71   | 4.01    | 4.2 | 0.344 | - 4.37 to 12.40 | 10.67   | 9.6  | 0.271        | - 8.48 to 29.83   |
|                    | Private        | - 26.77  | 12.7 | <b>0.039</b> | -52.20 to -1.35   | - 5.62  | 6.2 | 0.373 | - 18.13 to 6.88 | - 32.40 | 14.3 | <b>0.027</b> | - 60.96 to - 3.84 |
|                    | Government     | -1.69    | 7.8  | 0.830        | -17.35 to 13.95   | 1.74    | 3.8 | 0.654 | -5.96 to 9.44   | 0.04    | 8.8  | 0.996        | - 17.53 to 17.62  |
| LOCATION STATUS    | Urban          | 1        |      |              |                   | 1       |     |       |                 | 1       |      |              |                   |
|                    | Rural          | 4.86     | 5.1  | 0.345        | - 5.32 to 15.06   | 1.62    | 2.5 | 0.520 | - 3.38 to 6.64  | 6.49    | 5.7  | 0.262        | - 4.95 to 17.94   |
| DURATION STATUS    | < 2 weeks      | 1        |      |              |                   | 1       |     |       |                 | 1       |      |              |                   |
|                    | >2 weeks       | 34.66    | 6.4  | <b>0.000</b> | 21.74 to 47.57    | 1.75    | 3.1 | 0.584 | - 4.59 to 8.11  | 36.41   | 7.2  | <b>0.000</b> | 21.91 to 50.92    |

Source: the authors (2024).

Table 8. Quality of life in males (WHOQOL-BREF)

| WHOQOL-BREF        |                | Physiological |     |              |                   | Psychological |     |              |                 | Environmental |     |       |                 | Social |     |       |                 | Overall |      |       |                 |
|--------------------|----------------|---------------|-----|--------------|-------------------|---------------|-----|--------------|-----------------|---------------|-----|-------|-----------------|--------|-----|-------|-----------------|---------|------|-------|-----------------|
|                    |                | B             | SE  | P            | CI                | B             | SE  | P            | CI              | B             | SE  | P     | CI              | B      | SE  | P     | CI              | B       | SE   | P     | CI              |
| AGE                | 21 – 40 years  | -7.85         | 2.7 | <b>0.005</b> | -13.281 to -2.430 | 1.71          | 2.5 | 0.495        | -3.259 to 6.692 | -2.49         | 2.7 | 0.361 | -7.882 to 2.901 | -1.19  | 1.6 | 0.459 | -4.384 to 1.994 | -0.10   | 1.4  | 0.942 | -2.936 to 2.728 |
|                    | 41 – 60 years  | -6.54         | 2.5 | <b>0.011</b> | -11.562 to -1.529 | 2.36          | 2.3 | 0.310        | -2.234 to 6.967 | -3.41         | 2.5 | 0.177 | -8.404 to 1.567 | -1.24  | 1.4 | 0.405 | -4.191 to 1.707 | -0.44   | 1.3  | 0.738 | -3.062 to 2.176 |
|                    | Above 61 years | 1             |     |              |                   | 1             |     |              |                 | 1             |     |       |                 | 1      |     |       |                 |         |      |       |                 |
| MARITAL STATUS     | Single         | 1.71          | 2.0 | 0.417        | -2.46 to 5.88     | 2.97          | 1.7 | 0.092        | -0.49 to 6.44   | -0.75         | 1.9 | 0.704 | -4.680 to 3.175 | 0.70   | 1.1 | 0.555 | -1.655 to 3.059 | 0.07    | 1.1  | 0.950 | -2.160 to 2.303 |
|                    | Married        | 0.58          | 1.7 | 0.738        | -2.88 to 4.06     | 2.35          | 1.4 | 0.108        | -0.52 to 5.24   | -1.30         | 1.6 | 0.427 | -4.576 to 1.958 | 0.02   | 0.9 | 0.981 | -1.938 to 1.984 | 0.58    | 0.9  | 0.536 | -1.277 to 2.436 |
|                    | Widow          | 1             |     |              |                   | 1             |     |              |                 | 1             |     |       |                 | 1      |     |       |                 |         |      |       |                 |
| EDUCATIONAL STATUS | Uneducated     | 1             |     |              |                   | 1             |     |              |                 | 1             |     |       |                 | 1      |     |       |                 |         |      |       |                 |
|                    | Elementary     | -1.07         | 1.0 | 0.301        | -3.11 to 0.97     | 0.94          | 0.8 | 0.271        | -0.75 to 2.65   | 0.68          | 0.9 | 0.479 | -1.237 to 2.614 | -0.94  | 0.5 | 0.106 | -2.105 to 0.207 | 0.41    | 0.5  | 0.451 | -0.678 to 1.510 |
|                    | Higher sec.    | 0.56          | 1.1 | 0.627        | -1.75 to 2.89     | -0.03         | 0.9 | 0.974        | -1.96 to 1.90   | 0.22          | 1.0 | 0.841 | -1.965 to 2.405 | -0.77  | 0.6 | 0.241 | -2.090 to 0.533 | 0.078   | 0.6  | 0.901 | -1.164 to 1.319 |
|                    | College        | -0.85         | 1.6 | 0.608        | -4.138 to 2.433   | 0.96          | 1.5 | 0.528        | -2.051 to 3.975 | 1.15          | 1.6 | 0.484 | -2.111 to 4.419 | 0.068  | 0.9 | 0.944 | -1.863 to 2.000 | -1.10   | 0.86 | 0.204 | -2.819 to 0.611 |
| EMPLOYMENT STATUS  | Unemployed     | 1             |     |              |                   | 1             |     |              |                 | 1             |     |       |                 | 1      |     |       |                 |         |      |       |                 |
|                    | Self employed  | 0.67          | 1.3 | 0.624        | -2.04 to 3.38     | -2.47         | 1.1 | <b>0.031</b> | -4.73 to -0.22  | 1.50          | 1.2 | 0.243 | -1.042 to 4.055 | 0.91   | 0.7 | 0.238 | -0.616 to 2.443 | -0.57   | 0.7  | 0.433 | -2.022 to 0.875 |
|                    | Private        | 1.74          | 2.0 | 0.394        | -2.30 to 5.78     | -3.25         | 1.6 | 0.057        | -6.61 to 0.10   | 0.67          | 1.1 | 0.567 | -1.664 to 3.014 | 0.73   | 1.1 | 0.523 | -1.546 to 3.015 | -0.25   | 1.0  | 0.819 | -2.408 to 1.909 |
|                    | Government     | 1.27          | 1.2 | 0.309        | -1.20 to 3.76     | -2.492        | 1.0 | 0.019        | -4.55 to 0.42   | 3.24          | 1.9 | 0.093 | -0.553 to 7.045 | 0.03   | 0.7 | 0.960 | -1.368 to 1.439 | -0.19   | 0.6  | 0.774 | -1.522 to 1.136 |
| LOCATION STATUS    | Rural          | 1             |     |              |                   | 1             |     |              |                 | 1             |     |       |                 | 1      |     |       |                 |         |      |       |                 |
|                    | Urban          | -0.30         | 0.8 | 0.711        | -1.922 to 1.317   | 0.73          | 0.6 | 0.280        | -0.61 to 2.08   | -0.64         | 0.7 | 0.404 | -2.165 to 0.881 | -0.25  | 0.4 | 0.576 | -1.172 to 0.656 | -0.775  | 0.4  | 0.079 | -1.640 to 0.091 |
| DURATION STATUS    | < 2 weeks      | 1             |     |              |                   | 1             |     |              |                 | 1             |     |       |                 | 1      |     |       |                 |         |      |       |                 |
|                    | >2 weeks       | 1.85          | 1.0 | 0.076        | -0.19 to 3.90     | 0.445         | 0.8 | 0.605        | -1.26 to 2.15   | -0.90         | 0.9 | 0.354 | -2.833 to 1.026 | 0.74   | 0.5 | 0.202 | -0.410 to 1.906 | -0.245  | 0.5  | 0.658 | -1.341 to 0.852 |

Source: the authors (2024).

The poor outcome in the physical and overall component of facial disability index is significantly predicted by symptoms lasting more than 2 weeks in males and females. Whereas the poor quality in the physiological and social component of WHOQOL BREF is significantly predicted by the persistence of symptoms for more than 2 weeks in females compared to males.

#### 4. Discussion

The objective of the present study is to compare the quality of life outcome scores in males and females with Bell's palsy and the statistical analysis results indicated that females had poor quality outcomes compared to males and the poor outcomes are significantly reflected in physical, physiological, environmental and social contexts. In the same vein, age, lower educational qualification, and private and self-employment status in males protected them from lower quality scores. Despite the chances for a higher recovery rate, factors such as severity of nerve injury, extent of muscles paralyzed, age and comorbidities challenge and delays the recovery in individuals with Bell's palsy. The functional and aesthetic dysfunction impairs the quality of life in Bell's palsy individuals with poor prognosis.

Similar to the present study findings, Bylund et al.<sup>6</sup> reported that females with Bell's palsy suffer from psychosocial dysfunction compared to males. Contrastingly in the present study, there is no significant association identified in psychological outcomes for Bell's palsy patients. At the same time, the predicting factors associated with Bell's palsy females for physical, physiological, social and environmental components varied inconsistently. In this study Bell's palsy individuals with less than 2 weeks and more than 2 weeks were included and hence it is probably challenging to predict the influence of demographic characteristics in psychological component. This could be a contributing factor that the present study finding showed insignificant changes in the psychological component of the WHOQOL BREF scale.

The study findings revealed that graduated females lack quality in the environmental component of WHOQOL BREF. Females with facial deviations in Bell's palsy had low satisfactory scores for

traveling and participating in leisure or recreational activities. This could be due to the perception of low self-esteem and the stigmatization effect following Bell's palsy. According to Fugere et al.<sup>17</sup> and Crerand et al.<sup>18</sup> females are more concerned about their physical appearance and they consider as the most desirable trait. This could be a factor, hindering their satisfaction with public transportation and social participation. Low satisfaction with family members and spouse is also reported in Bell's palsy females. The inability to cope with the stress related to facial impairment might interfere their family relationships. Lack of communication, conflicts, avoidant actions, and disengagement from family hours could predict home environmental quality outcomes in females with Bell's palsy.

In this study, the physiological capacity of the WHOQOL BREF scale is significantly correlated with females employed in private sectors. Facial appearance is one of the components of body image perception.<sup>19,20</sup> Appearance-related dissatisfaction is reported more commonly among females than males in the workplace.<sup>21-23</sup> Appearance culture dominates in most workplaces in which the employees are insisted on achieving for a perfect look.<sup>24-26</sup> Inability to smile, drooping of the eyelid, drooling, and difficulty in speaking (pronunciation) negatively impact the personality and self-confidence during work and affect their performances. Additionally, incomplete closure of eyelids in Bell's palsy results in eye dryness and sleep deprivation leading to fatigue and lack of concentration during work. This could be attributed to significant findings associated with poor satisfaction for the physical component of WHOQOL BREF in the private sector.

The longer duration of facial impairment is a predicting factor for physical and overall components of facial disability index in males and females. In females, the longer duration of symptoms is associated with the physiological and social component of WHOQOL BREF. This indicates that a poor prognosis increases the risk of poor quality of life in Bell's palsy.

The first limitation of the present study is that the outcome measures lack components analyzing the prognosis with quality of life. Such outcome analysis could reflect the impact of disease prognosis or

therapy outcomes on the quality of life among Bell's palsy individuals. Secondly, the cross-sectional design methodology could not address the causal inferences. Several confounding factors such as participant's knowledge about the condition, family/spouse/healthcare provider support, insurance/reimbursement coverage benefits, treatments undergone, and adherence might affected the causality which is not addressed in this study. Additionally, the individuals included in this study were not categorized according to the stages of Bell's palsy.

The strength of the present study is the objective to identify the factors predicting quality outcomes in males and females with Bell's palsy. Additionally, the predicting factors and associated poor-quality outcomes could hamper the recovery in the form of a vicious cycle. The finding of the present study providing knowledge on the potential predicting factors could help to design strategies to improve quality of life.

The clinical application of the present study's interpretation could benefit the participants, clinicians/therapists, and stakeholders. As the quality of life outcome is affected more in females, clinicians/therapist-provided education about their diagnosis could reflect changes in their quality of life and well-being. Access to healthcare, assurance, and financial assistance from stakeholders could reduce the poor quality of life outcome-predicting factors in females such as pursuing higher education, private employees, and the presence of symptoms for more than 2 weeks.

Further studies examining the association of facial disability outcomes using the FaCE scale, Sunny Brook scale, or House Brackmann scale will add more insights to the present study.

## 5. Conclusion

The study results suggest that females are more susceptible to poor quality of life outcomes in Bell's palsy than males. In females, higher education and private sector employment are the predicting factors for poor outcomes in quality of life. Longer duration of symptoms predicted poor quality outcomes in both genders.

## Authors contributions

The authors declared that they have made substantial contributions to the work in terms of the conception or design of the research; the acquisition, analysis or interpretation of data for the work; and the writing or critical review for relevant intellectual content. All authors approved the final version to be published and agreed to take public responsibility for all aspects of the study.

## Conflicts of interest

No financial, legal, or political conflicts involving third parties (government, private companies, and foundations, etc.) were declared for any aspect of the submitted work (including but not limited to grants and funding, advisory board participation, study design, manuscript preparation, statistical analysis, etc.).

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## Appendix

### Appendix I. Data collection form

| SECTION A – Characteristics of the participants |  |  |           |
|---|--|--|-----------|
| S.no  | Information  | Response   | Code      |
| 1   | Participant ID code  |  |           |
| 2   | Assessors ID code  |  |           |
| 3   | Date of screening and place  |  |           |
| 4   | Date and time of enrollment  |  |           |
| 5   | Gender   | Male G1<br>Female G2   |           |
| 6   | How old are you?   |  |           |
| 7   | Marital status   | Single<br>Married<br>Widow/Divorced  |           |
| 8   | Educational qualification  | Not educated<br>Elementary School<br>Higher secondary school<br>College level higher education   |           |
| 9   | Employment status  | Unemployed<br>Self employed<br>Private employee<br>Government employee<br>House wife (if females)  |           |
| 10  | Location of residence  | Rural R1<br>Urban R2   |           |
| 11  | Date of diagnosis of Bell's Palsy  |  |           |
| 12  | Duration of days from the onset of bells palsy symptom                                     |  |           |
| 13  | Comorbid illness   | No Yes<br>(if No skip further questions and go to Section B)   |           |
| 14  | Answer the type of comorbid condition you are suffering from                               | Cardiovascular disorder C1<br>Neurological disorder C2<br>Metabolic disorder C3<br>Oncological disorder C4<br>Musculoskeletal disorder C5<br>Respiratory disease C6<br>Gastrointestinal disease C7<br>Hematologic disease C8   |           |
| 15  | Mention the duration of the comorbid condition that you are suffering from                 | Cardiovascular disorder D1 _____ duration<br>Neurological disorder D2 _____ duration<br>Metabolic disorder D3 _____ duration<br>Oncological disorder D4 _____ duration<br>Musculoskeletal disorder D5 _____ duration<br>Respiratory disease D6 _____ duration<br>Gastrointestinal disease D7 _____ duration<br>Hematologic disease D8 _____ duration |           |
| SECTION B – Quality of Life Outcome             |  |  |           |
|   | Quality of life outcomes   | <b>G1</b>  | <b>G2</b> |
| <b>A</b>  | Facial disability index<br><b>Total Score</b><br>Social<br>Physical                        |  |           |
| <b>B</b>  | WHO QOL BREF<br><b>Total score</b><br>Physical<br>Psychological<br>Social<br>Environmental |  |           |

Source: the authors (2024).