

## Association between multi-morbidity, sleep quality and negative emotions and their impact on subjective wellbeing of older adults: A Study

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### Abstract

The present study has made an attempt to explore the relationship between multi-morbidity and sleep quality among the elderly. The interrelation between poor sleep quality and negative emotions has also been examined in this study which further hampers the subjective well-being of the elderly. Multivariate Logistic regression model has been used to explore the association between multi morbidity, sleep pattern and subjective well being among the elderly. Result of the study shows that sleep quality and multi- morbidity have a significant direct effect on subjective well being of the elderly. The study concluded that negative emotional state like depression is negatively associated with sleeping pattern of the elderly. Although sleep disorder is not life threatening for the elderly, in the long run it can impair the immune system which lead to multiple diseases and reduce subjective well being among the elderly.

**Key words:** Multi-morbidity, sleep quality, subjective well-being, negative emotions.

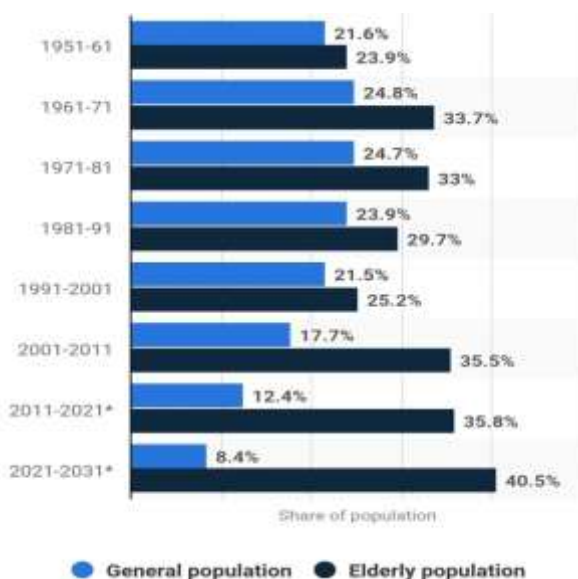
**Introduction:** Rapidly expanding number of elderly in the world population is one of the most significant demographic change that the world is witnessing currently. In India the number of older population started increasing due to an increase in the level of life expectancy from the time of independence and significant decrease in the birth rate. The growing elderly segments of the population are likely to face many challenges relating to health care, financial assistance, emotional and social needs. As it is well-known with the enhancement of age the physiological functioning of the human being declines followed by increasing risk of chronic diseases and possession of multiple diseases at a time which is commonly known as multi-morbidity (fortin et al,2012). According a research data shown by CHRLS (China Health and Retirement Longitudinal Study) 68.81% of the people between age group 45 and above are suffering from a chronic disease and 41.5% among them are suffering from more than one diseases simultaneously in 2015 (cheng.et al, 2019).

In many developed country the promotion of aging well in the later part of life is the key strategy of public health policy. In countries life U.K and U.S.A measuring successful aging has been shifted from absence of mental and physical health towards subjective well-being. Subjective well-being is refers to the cognitive appraisal of a person which describes how the person consider the global life satisfaction and also life satisfaction in specific domain like; career, family life and many more. High subjective well-being can be obtained by the experience intense and frequent positive feelings like feelings of hope, pride, joy etc and the absence of the negative emotions like:- depression, anger, jealousy etc. Studies reveal that subjective well-being plays an important role to influencing the life expectancy in the middle age and

older aged elderly (Iwasa et al, 2005). Positive subjective well-being can promote health social relationship, work ability, over all physiological ability and it improves the quality of life significantly (Ryan & Deci, 2001). Subjective well-being among the elderly is influenced by a number of factors such as: - health, social status, marital status, education level, income level, stress management ability and so on (An et al, 2008). Sleep quality of the elderly is also an important factor to be taken into consideration because when a person ages, both the length and depth of sleep declines and the elderly faces sleep disorder (National Institute of health, 2005). Sleep disorder is strongly associated with subjective well-being (Yokoyama et al, 2008). Sleep disorder is not life threatening but it can negatively influence the immune system of the elderly which further leads to physical illness and reduce subjective well-being in the long run (National Institute of Health, 2005).

Deprivation of sleep may hamper the effectiveness of emotion regulation strategies by creating undesirable consequences (Zhang et al, 2019). A number of studies shows that sleeping disorder is associated with negative emotions like the feelings of stress, anger, anxiety, loneliness etc (Minkel et al, 2012). Poor sleep quality among the elderly is associated with negative emotions like anxiety and depression and the negative emotions are strongly associated with subjective well-being of the elderly simultaneously (Wolkove et al, 2007).

**Relevance of the study:** Population aging represents itself as a worldwide phenomenon today. In India there were 149 million elderly population comprising 10.5% of the general population in the year 2022 and by 2050 this population will double to 20.8% with the absolute number at 347 million (UNEPA). According to the projection for 2021-31 the growth rate is expected to be five times the growth rate of the total population. Within this increasing group of elderly people in India, it is possible to detect a large number of people with different physical diseases and mental disorder.



As because mental health is essential to overall well-being of the elderly therefore it must be recognized and treated with the same urgency as the physical health and it should be a part of the public health mission. Depression is a type of mental disorder which is the most prevalent mental issue among the older adults associated with suffering and distress that can lead to impairments in mental, physical and social functioning. This phenomenon may be associated with the increased incidence of psychological issues and sleeping disorder further which can hamper the subjective well-being among the elderly.

**Objectives of the study:** The main objectives of the present study are-

- (i) To examine the association between multi-morbidity and sleep quality of the elderly.
- (ii) To study the inter relation between poor sleep quality and negative emotions among the elderly.

(iii) To analyze the impact of multi-morbidity and poor sleep quality on the subjective well-being of the elderly.

### Database and Methodology:

The present study is based on the primary data collected by “The Center of Excellence for Odisha Center of Geriatrics and Gerontology “of G.M University. The data samples are taken only from the rural areas of Sambalpur district. 300 data samples of different social categories and gender have been used and all the respondents are of age group 60 and above. This cross sectional study was been conducted by the help of a questionnaire and all the study procedure were approved by the university ethics committee. Demographic data of participants includes gender, age, living area, level of income, educational qualifications, marital status, monthly income, risk behavior, whether they have chronic disease, number of chronic disease etc. The questionnaire on prevalence of chronic diseases includes 19 chronic diseases. The sleep quality has been measured by Pittsburgh sleep quality index which is a self reported questionnaire assessing the quality of sleep during previous month containing 19 numbers of self rated questions yielding 7 dimensions. The total score range from 0 to 21, the higher score represent poorer sleep quality.

Simple quantitative method and descriptive technique has been adopted to interpret the obtained data. We have examined differences in baseline data between the group having multi-morbidity and non multi-morbidity. Then, we have used multivariate logistic regression analysis to explore into the association between sleeping pattern, multi-morbidity and negative emotions. Subjective well- being has been taken as the dependent variable and possession of multi-morbidity, disturbed sleep pattern and presence of negative emotions has been taken as the independent variables. The SWLS scale was used to measure subjective well-being among the elderly.

### Analysis of Data and Interpretation:

Table-1. Showing association between multi-morbidity and sleep quality

| Elderly suffering from multi-morbidity (%) |      | Elderly free from multi-morbidity (%) |
|--|------|---------------------------------------|
| Facing disturbed sleep pattern             | 74.5 | 3.9                                   |
| Having sound sleep pattern                 | 25.4 | 96                                    |

The above table shows association between multi-morbidity and sleep quality. The table reveals that among the elderly having multi-morbidity or suffering from more than two diseases simultaneously, 74.5% are facing disturbed sleeping pattern and only 25.4% of them have a sound sleeping pattern. It also shows that among the elderly those who are free from chronic diseases and multi-morbidity 3.9% are struggling with disturbed sleeping pattern but 96% of them are having sound sleeping pattern. The above data shows that morbidity can increase the probability of sleep disorder and the inadequate sleeping habit of the elderly can reduce the physical functioning while awaken.

Table-2. Showing association between sleeping disorder and negative emotions

| Negative Emotions | % of elderly facing sleep disorders | % of elderly having sound sleep |
|-------------------|-------------------------------------|---------------------------------|
| Feeling stress    | 70.8                                | 10.2                            |
| Anxiety           | 70.8                                | 7.8                             |
| Irritation        | 67.9                                | 2.4                             |
| Depression        | 65.6                                | 2.4                             |

Table no.2 shows the association between sleeping disorder and negative emotions. Negative emotions can be described as any feeling which causes a person to be sad and miserable or can make dislike one self and others. In our analysis we have taken the feelings of stress, anxiety, irritation and depression as negative emotions as per the responds of the elderly. Among the elderly those are facing sleeping disturbances 70.8% are feeling stressed. 70.8 % of the elderly among them

have reported the feelings of anxiety, 67.9% among them feel irritated and 65.6% are facing chronic depression. At the same time the elderly having proper sleeping shows a very fewer possibility of having negative emotions though it is not zero. Among the total elderly having a proper sleeping pattern or having a sound sleep reported that 10.2% of them feel stress, 7.8% of them have the feeling of anxiety, and only 2.4% of them feel irritated and depressed. It is clearly visible from the above table that sleep deprivation can exacerbate the mood, which can develop negative emotions among the elderly and sleeplessness is also a symptom of negative emotions such as depression and anxiety etc.

Table.3-Showing impact of sleep quality and multi-morbidity on the subjective well being of the elderly

| Variants                                  | % of elderly satisfied with their present life | % of elderly not satisfied with their present life |
|---|--|--|
| Elderly having multi-morbidity            | 15.6   | 84   |
| Elderly free from multi-morbidity         | 96   | 3.1  |
| Elderly having disturbed sleeping pattern | 7.4  | 92.5   |
| Elderly having sound sleep                | 84.3   | 15.6   |

The above table shows the impact of sleep quality and multi-morbidity on the subjective well-being of the elderly. As the table represents, 84% of the elderly with multi-morbidity are not satisfied with their life while only 15.5% among them are satisfied. On the other hand among the elderly free from multi-morbidity 96% of them are satisfied with their life but the response of 3.1% of them shows that they are not satisfied with their life. Among the elderly having disturbed sleeping pattern only 7.4% are satisfied with their life and a majority of them that is 92.5% are not satisfied with their life. Alternatively among the elderly having proper sleeping pattern, majority of them that is 84.3% are satisfied with their life while 15.6% of them are not satisfied with their life. The data represented in the above table clearly reveals that disturbed sleeping pattern leads to negative emotion which further hamper the life satisfaction of the elderly, because sleep quality is not only associated with current but also with the subsequent life satisfaction of the elderly. Multi-morbidity is both the cause and effect of the disturbed sleeping pattern among the elderly hence it also negatively influence the subjective well-being of the elderly.

#### Statistical Analysis:

| SUMMARY OUTPUT               |                 |
|------------------------------|-----------------|
|                              |                 |
| <i>Regression Statistics</i> |                 |
| <b>Multiple R</b>            | <b>0.811291</b> |
| <b>R Square</b>              | <b>0.658193</b> |
| <b>Adjusted R Square</b>     | <b>0.654741</b> |
| <b>Standard Error</b>        | <b>0.294152</b> |
| <b>Observations</b>          | <b>301</b>      |

|              | <i>Coefficients</i> | <i>Standard Error</i> | <i>t Stat</i> | <i>P-value</i> | <i>Lower 95%</i> | <i>Upper 95%</i> | <i>Lower 95.0%</i> | <i>Upper 95.0%</i> |
|--------------|---------------------|-----------------------|---------------|----------------|------------------|------------------|--------------------|--------------------|
| Intercept    | 1.886246            | 0.026191              | 72.01771      | 4.3E-190       | 1.834702         | 1.937791         | 1.834702           | 1.937791           |
| X Variable 1 | 0.030919            | 0.058437              | 0.529109      | 0.597125       | -0.08408         | 0.145922         | -0.08408           | 0.145922           |
| X Variable 2 | -0.10881            | 0.052922              | -2.05596      | 0.04066        | -0.21295         | -0.00466         | -0.21295           | -0.00466           |

X

Variable

|   |          |          |          |          |          |          |          |          |
|---|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 | -0.75231 | 0.060231 | -12.4905 | 4.63E-29 | -0.87085 | -0.63378 | -0.87085 | -0.63378 |
|---|----------|----------|----------|----------|----------|----------|----------|----------|

We examined association between multi-morbidity, sleep quality and negative emotion and also explored their impact on subjective well-being of the elderly by using multivariate logistic regression model. The outcome variable is subjective well being of the elderly. The R square value of our analysis shows that the independent variables are creating 65.8% variability in the dependent variable. The model summary appears to be statistically significant as the p value < of the coefficients are less than 5% and it suggested an inverse relationship with the outcome variable.

### Summary and Conclusion

The study concludes that sleep quality and multi-morbidity are strongly associated with each other; sleeping disorder is both the cause as well effect of multi-morbidity. Negative emotional states are negatively associated with the sleeping pattern of the elderly. Poor sleep quality may leads to the development of negative emotions like irritation and other cognitive disorder which often hamper the well being of the elderly. More over we can say although sleep disorder is not life threatening but in the long run it can impair the immune system of the elderly which leads to multiple diseases and develop negative emotions among them and hence hamper the subjective well-being of the elderly.

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