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Exploring Varied Physical Activity Levels, Health Status, Happiness And Depression Among Elderly Individuals With Diabetes Of Pakistan: A Sociological Perspective

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Abstract
Recent studies have shown that Pakistan is among the top 10 countries worldwide for diabetes prevalence. 26.3 million adults in Pakistan have diabetes. In Pakistan, a gradual increment in the population of older people has been noticed in the past few years. It is calculated that in the next 25 years, 16% of the population of Pakistan will be 65 years old and above. Being physically active is critical in avoiding and managing diabetes among older people. The purpose of this study was to dissect the relationship between varying levels of physical activity (mild, adequate, intense), bodily well-being, level of joy, and signs of depression among old diabetics. This study used a mixed-method technique, mixing quantitative inspection of being physically active and overall well-being of older individuals with diabetes with qualitative examination of subjective welfare. This study included 250 participants of age 50 and above from different cities of Punjab. A Google questionnaire was used for in-depth questioning. Results showed that medium and hard physical activities are more effective for maintaining normal blood glucose levels, better physical health, reducing depression, and promoting happiness in old diabetic patients. This study recommends that health trainers and therapists working with old diabetic individuals should motivate them to take part in moderate to challenging physical activities and also adjust the level of physical activities according to the individual's body needs. It is well known that physical activity is not only associated with physical well-being but also emotional and psychological well-being. Being physically active produces dopamine and serotonin hormones associated with happiness.

Keywords: physical activity, psychological well-being, happiness, depression, diabetes, health status

Introduction:

Like many other developing countries, Pakistan is undergoing a demographic shift. There is a notable increase in the senior citizen population, giving rise to an increased burden of long-lasting diseases, especially diabetes mellitus. Due to this fact, it has become critical to investigate the association between the levels of physical activity performed and psychological well-being for designing techniques to improve overall health and wellness in old diabetics.

Pakistan is facing a huge health concern caused by the increased burden of people suffering from diabetes mellitus. Recent studies have shown that Pakistan is among the top 10 countries worldwide with diabetes prevalence, with 26.3 million adults in Pakistan suffering from Diabetes mellitus (IDF et al., 2019). The worst part is that the prevalence of diabetes mellitus is predicted to increase in coming years owing to factors such as urbanization, inactive lifestyles, dietary habits, an increase in the aged population, etc.

The demographic status of Pakistan is changing expeditiously, with a massive increase in older population. UN predicted that by 2050, 16% of the population of Pakistan will be 50 years old or above (United Nations, 2019). Due to this reason, Pakistan's healthcare system is burdened by chronic diseases, proposing complicated challenges for the healthcare system and society.

Being physically active plays a huge role in managing and treating diabetes in old diabetic people. Regular exercise keeps blood sugar levels in control, improves heart health, and reduces the risk of diabetes-related complications like nerve damage, vision-related issues, heart diseases, and kidney damage (Colberg et al., 2016). However, much research remains on how regular exercise impacts older diabetic people and their health.

In older diabetic patients, regular exercise and physical activity not only help in being physically healthy but also promote mental and emotional well-being. A sedentary lifestyle is a preliminary cause of illnesses like depression and anxiety; on the other hand, being physically active is linked to superior psychological well-being (Hamer et al., 2018). There is a need to explore and comprehend the delicate association between exercising regularly and participating in healthy activities with the mind and bodily health of older diabetic individuals of Pakistan to develop plans to promote better physical and psychological health in older diabetic people.

Many studies have proposed physical activity and regular exercise as key to improving the physical and psychological health of elderly diabetic individuals (Scarmeas et al., 2001; Wilson et al., 2002). Regular physical activities have been related to better

physical health, lower death rates, improved stamina, regulated blood sugar levels, and increased life span (Feldman et al., 2015). Netz et al., (2005) figured out that older patients with diabetes who were more physically active were more fit psychologically than the ones who led a sedentary lifestyle.

Literature Review:

This research found that the association between the intensity of workouts performed by older diabetic people living in Pakistan and their physical, emotional, and psychological betterment is complicated and intricate. This study used existing research to assess how much knowledge we currently have about this topic and pinpoint the gaps in our understanding of this issue.

Several studies have emphasized the importance of regular exercise on the physical and emotional well-being of diabetic patients. Saleem et al. (2019) supervised research that showed that diabetic individuals who participated in regular physical activity showed improved blood sugar levels and better heart health. Likewise, Basharat et al. (2020) conducted a study emphasizing the positive influence of physical activity programs on physical well-being and emotional fulfillment of older diabetic patients living in Pakistan. These studies highlight the importance of implementing structured physical activity programs to improve the physical well-being of the elderly diabetic population of Pakistan.

The alliance between the frequency of being physically active and mentally fit, along with feelings of sadness and happiness, in the elderly population suffering from diabetes mellitus is an expanding area of research. However, there is not enough research done on this topic in the context of Pakistan, but overall, studies indicate an essential relation between regular physical activity and its effect on the mental health of diabetic patients. Ahmad et al. (2018) reviewed various studies and deduced invariant proof of a connection between high-intensity workouts and reduced signs of depression among old diabetic patients in low- and moderate-income producing countries. However, there is a need for more extensive research to clarify how physical activity levels affect the psychological health of old diabetic individuals and how it works in the context of Pakistan.

Factors that play a critical role in the health of elderly diabetic individuals in Pakistan are social and economic situations, conventional practices, and social support networks. Research has shown that family and community support can have a significant influence on health-related decisions made by elderly diabetic individuals and can help them adhere to a healthy lifestyle (Jawaid et al., 2017). Cultural views about aging, disease, and physical activity have an influence on an individual's behavior regarding regular exercise and taking care of oneself (Jafar et al., 2019). To devise plans to help older diabetics in Pakistan, we need to have a deep insight into these social and traditional beliefs to come up with strategies and techniques to promote physical activity in these individuals.

There is significant evidence that regular exercise and physical exertion are beneficial for the bodily and psychological well-being of the general population as well as older individuals suffering from diabetes mellitus (Chudyk & Petrella, 2011; Colberg et al., 2016). Research supports that regular exercise and moderate to hard workouts have favorable outcomes like reduced blood pressure, better glycemic control, and increased insulin sensitivity in older individuals with diabetes (Chudyk & Petrella, 2011; Colberg et al., 2016). American Association of Diabetes Mellitus advises old individuals who have diabetes to partake in aerophilous exercises for two and a half hours weekly and engage in strength training workouts two times a week (Yardley et al., 2014). We have established positive bodily results of physical activity in old adults suffering from diabetes mellitus. However, there is still little to no research on how regular physical activity impacts their emotional and psychological health.

Some studies have highlighted how various intensity workouts (easy, intermediate, intense) have different effects on the well-being of old individuals suffering from diabetes mellitus (Ekelund et al., 2009; Lee et al., 2005). The conclusion is intermediate workouts cause improved digestion. However, Jelleyman et al. (2015) uncovered that intense workouts are more efficient in improving heart health and maintaining blood sugar levels throughout the day in older individuals with diabetes. These varying conclusions can be due to differences in investigation method, study design, sample characteristics, size of sample, and related statistic authority. These different findings demonstrate a need for further studies and research to work out the best intensity levels of workouts for old individuals with diabetes for their physical and mental well-being.

For this purpose, this research focused on investigating how varying intensity levels of workouts impact aged patients with diabetes. This study compares the physical and psychological health measures of three groups of elderly diabetic patients who were partaking in varied-intensity workouts daily.

Physical Activity and Diabetes

More frequent workouts have a significant role in preventing diabetes and elevating physical and mental health. Regular exercise leads to several health benefits, such as more energy, control of blood sugar levels, decreased blood pressure, and maintaining a healthy weight in individuals suffering from diabetes mellitus (Chudyk & Petrella, 2011). Research has uncovered that partaking in intermediate workouts decreases the risk of diabetes-related complications like heart disease and concurrently reduces the death rate of elderly individuals with diabetes. Koska et al. (2018) executed scientific research on how older diabetic individuals who went on regular walks had better glycemic control and reduced the risk of diabetes-induced complications. In a literature review about Tai Chi's effects on equilibrium refinement, Palermi et al. (2020) discovered that adults with diabetes can improve bodily equilibrium by performing Tai Chi exercises daily.

Several pieces of research support the benefits of high-intensity workouts on the bodily health and mental wellness of elderly diabetic people. Liubaoerjijin et al. (2016) discovered that high-intensity workouts were more effective in a more significant reduction in glycated hemoglobin in individuals with type 2 diabetes mellitus compared to low- or moderate-intensity workouts. Additionally, cohort-based epidemiological studies have demonstrated that high-intensity physical activities are

more effective in reducing the incidence of heart disease and early death in older individuals with diabetes in comparison to low-intensity physical activities (Yates et al., 2014). All these studies support that high-intensity physical activities are more effective in promoting better glycemic control, cardiovascular health, and longer life spans in elderly individuals with diabetes.

Research Objectives:
The purpose of this study was to analyze how various intensity level workouts and energy levels, satisfaction levels, depression, and overall well-being of elderly individuals suffering from diabetes mellitus living in Pakistan are linked together. One important objective was to analyze how different intensity workouts (easy, moderate, intense) affect the physical well-being of older individuals with diabetes. Another aim of this research was to study how different activity levels affect the mental and psychological health of older individuals with diabetes.

Research Methodology:
This study utilized a mixed-method approach by combining quantitative inspection of physical activity and health indicators with qualitative investigation of the subject's well-being. The goal of this research is to illuminate the complications in the management of diabetes mellitus with a focus on physical and psychological well-being.
Sample
This study involved 250 participants with diabetes mellitus who were interrogated about awareness of their health and contentedness and their frequency of participation in workouts. Their responses were recorded on the Center for Epidemiologic Studies Depression Scale for further evaluation.
Measures

Physical activity. The respondent's levels of physical activity were determined using a question: "On average, over the last 12 months, how often have you participated in intense workouts or exercise?" Participants were asked to rate their physical activeness levels on a scale (zero= "never," one= "less than once a month," two= "1-3 times a month," three= "1-2 times in a week," four= "3-4 times in a week," five = "5 or more times in a week"). Then we divided the participants into different groups based on how often they were working out: an infrequently working out group (once or twice a week), a moderately active group (three to four times a week), and a frequently working out group (more than five times a week).

Physical health. The participants' bodily health was evaluated with a question: "This section is about your physical health. Would you say your health is excellent, very good, good, fair, or poor?" The respondents answered questions about their health on a scale containing five points (one point = "poor", two points = "fair", three points = "good", four points = "very good", five points = "excellent") higher points indicated better bodily health. This scale is often used to evaluate self-perceived physical well-being.

Happiness. Self-perceived happiness levels were also inquired by one question: "If you were to consider your life these days, how happy or unhappy would you say you are, overall?" The participants answered about their happiness on a scale containing five points (one = "unhappy mostly," two = "unhappy sometimes," three = "pretty happy," four = "very happy," five = "extremely happy"), increased points on the scale denoted elevated contentment levels. Pavot (2018) affirmed that contentment levels can be measured by a single question in health studies and that it is dependable, accurate, and feasible.

Depression. Center for Epidemiologic Studies Depression Scale was used to estimate the depression in older people suffering from diabetes mellitus.
D). (Kohout et al., 1993) Recommended using a revised 8-item version for elderly individuals with diabetes. The 8-item version used in this study enveloped topics like "appetite," "depression," "struggle," "sleep," "socialization," "unhappiness," "dislike," and "excitement." The question used to estimate "depression" went like "During the past week, I felt depressed." Participants rated their depression on a scale (zero = "rarely or none," one = "sometimes," two = "occasionally," three = "most of the time"), with elevated points denoting extreme depression.

Covariance, Age, and Gender
Factors like age and gender were taken into account while conducting this study. Demographic factors like age and gender play an integral role in assessing the well-being of older individuals. For instance, women and aged people experienced greater impediments in performing physical activities than men. The level of activity limitation is inversely related to the frequency of being physically active and socializing (World Health Organization). After taking these demographic impacts into consideration, age and gender were included as control variables in this research.

Data Analysis
Several preliminary analyses were performed, including Pearson's correlation analysis, a descriptive data analysis, and a scale reliability test before performing the main analysis. In the next step, a control variable examination was conducted for the examination of the relationship between control variables and dependent variables. In the final step, a multiple variant analysis of control variables was done to control the influence of the control variables and examine the dependent variables' differences. As a result, we explored the dissimilarities in the outcome of variables such as bodily health, contentment, and sadness based on how often our subjects participated in workouts under controlled conditions of age and gender. All statistics were carried out using the SPSS 25.0 statistical package.

Results

The results show an overall view of the participant's primary attributes. The participants were grouped into 10-year age range groups, from 50 to 70 years old and above. There were 50% females and 50% males in the participants. Half of the respondents were married, about 25% were widowed, and some were single.

25% of the respondents worked out less than one time in a week, 50% worked out less than thrice in a week, and only 18% of the participants worked out more than five times weekly.

From the questionnaire, we concluded that the people who took part in light-intensity workouts were less physically fit than those who participated in moderate-intensity workouts. The people who engaged in intense workouts more often had better bodily health than those who participated in moderate-intensity workouts. It was also observed that participants partaking in light-intensity workouts reported more signs of depression and poor mental fitness than the ones who engaged in medium or intense workouts. Additionally, the participants who performed vigorous physical activity rated themselves higher on the happiness scale in comparison to the other two groups.

Discussion:

This study was only preliminary research on how varied intensity levels of workouts are linked to happiness levels, improved physical health, and depression in elderly individuals suffering from diabetes. The results revealed that varied intensity level workouts did have a significant impact on the physical well-being, psychological health, and mental health of older diabetic individuals. Respondents who participated in intermediate and intense workouts showed better bodily health than the ones only engaging in light-intensity workouts sometimes. Additionally, respondents engaging in strenuous physical activities more often represented better health than the ones performing moderate levels of physical exercises. Talking about the association of physical activity levels with happiness levels, we discovered that participants engaging in intense workouts documented significantly elevated contentment levels and fewer symptoms of sadness than the ones engaging in light-intensity workouts. The present research concludes that intermediate and intense workouts are superior in promoting better bodily and psychological health and lowering depression in the elderly with diabetes compared to light physical activities performed infrequently.

There is significant evidence that intermediate and intense workouts can lead to physical well-being in individuals suffering from diabetes mellitus (Chudyk & Petrella, 2011). Few studies support the fact that intermediate workouts are superior at promoting bodily fitness in comparison to intense workouts (Koska et al., 2018; Palermi et al., 2020); on the other hand, some studies argue that vigorous physical activities are better in benefiting physical health (Liubaoerjijin et al., 2016). Presenting research encourages the argument that intense workouts are more effective at promoting physical health in diabetic patients in comparison to moderate levels of physical activity. Based on our research and responses to participants on questionnaires, we found out that individuals who frequently participated in intense physical activities rated their bodily fitness better than the ones who engaged in medium-intensity workouts.

Older studies conducted on international levels have indicated that higher physical activity levels in elderly individuals suffering from diabetes mellitus are frequently associated with higher happiness levels (Kye et al., 2014; Piqueras et al., 2011). Our research agreed with these previous studies by demonstrating that old individuals suffering from diabetes who took part in intense workouts more often rated themselves higher on happiness scores than those who infrequently engaged in light physical activities. These results imply that the intensity and frequency of workouts significantly impact the happiness levels of old people suffering from diabetes.

When it comes to intensity levels of workouts and their association with symptoms of sadness in old people suffering from diabetes, older researchers showed varied results. Few studies showed that old people suffering from diabetes engaging in intense workouts documented fewer signs of depression (Chi et al., 2015; Joshi et al., 2016). Other studies denoted that older individuals with diabetes partaking in light-intensity workouts showed very few symptoms of depression (Heesch et al., 2011; Jung et al., 2018). Some studies were of the view that vigorous workouts can lead to bodily and psychological exhaustion, thus leading to depression eventually. These studies recommended moderate physical activity as the most suitable solution for the psychological well-being of older diabetic individuals.

Our research supported that moderate levels of physical activity in older diabetic individuals were most effective for minimizing depression.

Nonetheless, our study also discovered that individuals who were engaging in intense workouts showed fewer signs of depression than those participating in light or moderate workouts. These varied results indicated that an old diabetic person's practical capabilities and age group variables might be affecting the signs of depression as well as the frequency of physical activities performed.

Conclusion

This study was preliminary research on how different-intensity workouts link to the bodily and psychological well-being of aged people with diabetes. This study concluded that participating in different-intensity workouts could positively influence the physical fitness and mental soundness of elders with diabetes mellitus. Research suggests that intense workouts are more influential in promoting bodily fitness and psychological well-being as compared to low-intensity workouts.

Suggestions:

This study believes that physical trainers and psychologists should work with old people suffering from diabetes mellitus and motivate them to participate in workouts. They also devise workout plans that best suit the individual's physical needs. It is

also suggested that governments should prioritize policies that enhance access to integrated healthcare services, including mental health support, for elderly individuals with diabetes and depression. This involves subsidizing mental health treatments, expanding coverage under public health insurance, and establishing specialized geriatric mental health clinics. Additionally, community-based support programs and initiatives to promote physical activity among older adults can improve overall well-being. Public awareness campaigns and educational resources should also be implemented to reduce the stigma surrounding mental health issues and encourage early intervention.

Limitations and Future Studies

There were many impediments to our research :

1. This research focused on the association between different-intensity workouts and the psychological health of elderly individuals suffering from diabetes mellitus. Still, it did not specify the types of physical activities performed. Further studies should be able to explore how different types of physical activity like, sports, aerobic exercises, cycling, yoga, etc have different effects on the bodily and psychological fitness of old people with diabetes mellitus.
2. There was a lack of information on the types of diabetes in older adults in secondary data, and it limited how these different types of diabetes affect the bodily and mental fitness of these individuals differently. More research is needed to navigate these differences.
3. This study had a cross-sectional design, which meant it could not illustrate the causes and effects of the relationship between different intensity levels of workouts and their positive impacts on health, emphasizing the need for longitudinal analysis.
4. Variables like physical limitations, demographics, and onset time of diabetes mellitus also influenced how physically engaged these participants were, leaving a need for further research for a more thorough understanding.

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