

A Study on How Physical Activity Affects Mental Well-Being of Security Guards in Sangli, Miraj, and Kupwad Areas: A Survey Study

Anthikat M¹, Tanpure S², katke S³

¹PhD MPT Neuroscience Physiotherapy, Professor and HOD, Department of Neuroscience physiotherapy, Bharati, vidyapeeth University, School of Physiotherapy, Sangli.

²BPTH, Bharati Vidyapeeth, Deemed University, School of Physiotherapy, Sangli.

³Principal School of physiotherapy, Bharati Vidyapeeth Deemed to Be University, Sangli, Maharashtra, India.

Abstract:

Background with need: Physical activity helps in preserving health and well-being of individuals. Most physically demanding positions particular those in security services require certain level of physical fitness, along with good mental health to cope up with normal stress of life. It can be hampered due to lack of sleep. This study aims to explore correlation between physical activity and mental Health among security guards.

• Objectives:

Primary Objective:

1. To find out the Physical Activity level by using International Physical Activity Questionnaire in Security guards in Sangli Miraj Kupwad corporation.
2. To find out the Mental Health status by using General Health Questionnaire in Security guards in Sangli Miraj Kupwad corporation

Secondary Objective: To find out Correlation between Physical Activity and Mental Health.

Methodology: For study purpose, security guards aged between 35-55 years both male and female (mean= 45) took part in study. By using general health questionnaire to assess mental health and international physical activity questionnaire to assess physical activity. The data collected related to moderate, vigorous, domestic, leisure time activities along with data of their psychological well-being.

Result: Spearman's rank correlation revealed a negative correlation between mental health concerns and physical activity (Spearman's $\rho = -0.228$, $p = 0.001$). This negative value shows that as mental health concerns increase, levels of physical activity tend to decrease.

Conclusion: the findings show a significant inverse relationship between mental health concerns and physical activity levels.

Keywords: Mental Health, physical activity, security guard, correlation

Introduction :

One essential strategy for promoting and preserving the Health & Well being of both Individuals and Populations is Physical Activity¹. Physical Activity is defined as "any force exerted by Skeletal muscles that results in energy expenditure above resting level"². Engaging in physical activity is usually

distinguished by the activity's mode or kind (eg. Walking Running, Sweeping), frequency (How often), length (minutes) & Intensity (mid, moderate, strong)³. Health care workers, firefighters, Agricultural workers, Manufacturing workers, Military personnel, Loggers, Warehouse workers and many more Occupations that require Physical Activity, Security Services are also one of them. Most physically demanding positions, particularly those in the security services, require a certain level of physical fitness. By matching their abilities to the physical requirements of their jobs, it is necessary to make sure that the Security guard are both physically fit for work and physically fit for Life³. Security guard duties include monitoring, advising, keeping, and, most importantly, preventing crimes⁴. One factor which is related to Physical Activity is Mental Health⁵. Mental Health is defined by the World Health Organization (WHO, 2009) as a state of well-being in which the individual realizes his or her own abilities, can cope up with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community⁶. Security guard is one of the occupations with substantial risk to get involve in incident at work such as violence and crime⁷. Long hours working, repeatedly changing shifts may lead to poor work productivity. Stress levels might affect security guards' ability to execute their jobs⁸. Physical inactivity is a Global Public Health priority due to the high incidence, its detrimental effects on the environment and human health, and the evidence of successful physical activity promotion techniques⁹. Poor Mental health status is at substantial risk for aggressive acts as well as mentally strong individual can cope up with many different situations without any aggressive acts⁶. Due to the incredibly demanding nature of both shift work and security guard jobs, health and wellbeing issues have grown increasingly significant¹⁰. Professionals known as security guard are in charge of ensuring the Safety and Physical integrity of workers, visitors, and employees in public establishments like universities³. The International Physical Activity Questionnaire (IPAQ) was created as a tool for tracking physical activity and inactivity across national borders¹¹. To gauge Population health-related physical Activity (PA), the International Physical Activity Questionnaire (IPAQ) was created¹². The General Health Questionnaire (GHQ) is a self-administered screening questionnaire¹³. The principle components of General health questionnaire are that it can use in psychiatric patients and in psychologically healthy individual¹⁴. This study aims to explore co-relation that exists between Physical Activity and Mental Heath among security guards in Sangli, Miraj, Kupwad corporation. Security guard having considerable risk of Mental health illness due to many occupational factors. Earlier studies on security guards were focussed on their circadian rhythm disturbance which leads to insomnia, their ergonomic status and work productivity, cardiovascular health etc... This study will help to conclude the co-relation of Physical activity and Mental health in security guard in Sangli Miraj Kupwad corporation.

Materials and Methodology :

1. Study place: Sangli-Miraj-Kupwad corporation.
2. Study design: A cross-sectional study will be conducted among Security guards in Sangli Miraj-Kupwad corporation.
3. Study duration: 06 months
4. Study population: Security guards in Sangli-Miraj-Kupwad corporation.
5. Selection of cases (Study subjects):

Criteria:**Inclusion criteria:**

- Age criteria 35-55 years. (Both male and female)
- The person must currently be employed as a security guard and have at least five years of experience in the field.

Exclusion criteria:

- Subject having any medical, orthopedic, neurological, cardio-respiratory conditions will be excluded from study.
- Subject with any habits and addictions.
- Subject who are not willing to take part will be excluded from study.

Sampling technique : Convenient Sampling.

Sample size: 240

sample size the formula used is $n = z^2 * p * q / c^2$, Where $n=240$. Where, n - sample size.

z -confident interval Z table value at 5% level of significance.

Parameters to be studied (Study variables):

- Physical activity of security guards.
- Mental health of security guards.

Study tools:

1. International Physical Activity Questionnaire for Physical Activity.
2. General Health Questionnaire for Mental Health.

Both questionnaires are valid and reliable.

X. Statistical Analysis: Confidence level 95%, Margin of error 5%, Population Proportion 50% & population size is 632 so the sample size comes is 240.

ETHICAL CONSIDERATIONS AND CONSENT: The survey was conducted after the Institutional Ethics Committee reviews the proposal and grants Ethical approval to conduct the study. The participants were given a central idea about the purpose behind the study. A voluntary written informed consent was obtained from the study participants before conducting the survey.

Results:

The data analysis was performed using proper descriptive and inferential statistical methods. Descriptive statistics, including mean and standard deviation, were used to summarise continuous variables such as age, height, weight, various components of physical activity (vigorous, moderate, walking, transport), sitting time, and General Health Questionnaire (GHQ) scores. The Chi-square test of independence and Co relation analysis was used to determine the relationship between physical activity levels and mental health status, as well as gender-wise distribution across mental health and activity categories. P value was statistically significant below 0.05.

Table 1. Mean Distribution of the variables.

Sr no.	Variables	Mean + SD
1	Age of the participant (in years)	45.08 ± 6.73
2	Height (in feet)	5.86 ± 4.25
3	Weight in kg	68.56 ± 14.41
4	Time in Vigorous Physical Activity (MET-min/week)	1631.62 ± 748.47
5	Time in Moderate Physical Activity (MET-min/week)	818.63 ± 646.96
6	Active transport (MET-min/week)	240.23 ± 162.89
7	Walking for Leisure/Exercise (MET-min/week)	487.90 ± 144.02
8	Sitting time-minutes / week	83.83 ± 41.59
9	Total Physical Activity (all MET scores combined, MET-min/week)	3262.22 ± 1063.35
10	General Health Questionnaire Score (Psychological Well-being)	11.78 ± 5.94

The present study included a total of 240 participants. The mean age of the participants was 45.08 ± 6.73 years, showing a middle-aged sample with relatively low age variability. The average height was 5.86 ± 4.25 units—the large standard deviation suggests a need to verify the measurement unit (in feet or decimeters). The mean body weight was 68.56 ± 14.41 kg, reflecting a broad range of body types in the sample. About physical activity, participants reported spending an average of 1631.62 ± 748.47 MET-min/week on vigorous activities, and 818.63 ± 646.96 MET-min/week on moderate-intensity tasks. Time spent on active transportation (e.g., walking or cycling) averaged 240.23 ± 162.89 MET-min/week, while leisure walking was 487.90 ± 144.02 MET-min/week. Participants reported an average of 83.83 ± 41.59 minutes per day of sitting time, which is a useful marker for sedentary behaviour. The total physical activity, summing all MET scores, was 3262.22 ± 1063.35 MET-min/week, reflecting an overall moderate to high activity level in the cohort. Finally, the General Health Questionnaire (GHQ) score, a measure of psychological wellbeing, averaged 11.78 ± 5.94, suggesting moderate psychological distress among some participants.

Table 2: Association of Physical activity with mental health Status.

		MENTAL HEALTH STATUS			Total	Chi square (p value)
		Mild	Moderate	Normal		
	High	42	4	84	130	40.585

Physical Activity						(0.001) *
	Low	0	1	0	1	
	Moderate	64	10	119	109	
Total		106	15	119	240	
Spearman correlation		-.228(0.001) *				

Table 3: Frequency and Percentage distribution of the variables.

category	Response	Percentage %
Physical Activity	High	54.20%
	Moderate	45.40%
	Low	0.40%
Mental Health	Normal	49.60%
	Mild	44.20%
	Moderate	6.30%

Table 4: Frequency and Percentage distribution of Gender.

Gender	Frequency	Percent
Female	66	27.5
Male	174	72.5
Total	240	100.0

Table 5. Association in relation to the distribution of Gender.

Gender	Mental Health	Physical Activity
Female	15.36 (0.933)	20.76(0.382)
Male		

Table 2: Association of Physical Activity with Mental Health Status.

This table shows a significant association between physical activity levels and mental health status among participants. A single participant with low physical activity exhibited moderate psychological distress. The

association was statistically significant ($\chi^2 = 40.585$, $p = 0.001$), showing a negative correlation between mental health concerns and physical activity levels (Spearman's $\rho = -0.228$, $p = 0.001$).

Table 3: Frequency and Percentage Distribution of Physical Activity and Mental Health Categories.

In terms of physical activity, this distribution reflects a favourable psychological profile, especially in physically active individuals.

Table 4: Gender Distribution

Out of 240 participants, 174 (72.5%) were male, and 66 (27.5%) were female, suggesting a male-dominant sample.

Table 5: Association of Gender with Mental Health and Physical Activity.

Chi-square analysis showed no significant association between gender and mental health status ($\chi^2 = 15.36$, $p = 0.933$) or gender and physical activity levels ($\chi^2 = 20.76$, $p = 0.382$).

Discussion:

This research employed a cross-sectional correlational study design and was conducted in and around SMKC. A total of 240 security guards were selected using convenient sampling. Individuals with medical conditions such as Cardiorespiratory, orthopedic, or neurological disorders were excluded from participation. The study included healthy male and female security guards aged between 35 to 55 years who provided informed consent. The International Physical Activity Questionnaire (IPAQ) was used to evaluate physical activity levels. It includes 27 questions that gather information on physical activities across various behavioral domains, such as Job-related, transportation, Housework, leisure time activities, Time spent sitting and recreational activities. To measure physical activity, Metabolic Equivalent of Task (MET) scores were calculated individually for each domain and its subdomains. MET values are used to represent the intensity of physical activity. One MET is defined as the energy expenditure associated with sitting quietly, which equals a caloric consumption of 1 kcal per kilogram per hour. The analysis of IPAQ data followed the established guidelines: It is estimated that a person's caloric expenditure is 4 times higher during moderate activity and 8 times higher during vigorous activity compared to sitting quietly. As a result, when calculating overall energy expenditure using IPAQ data, 4 METs are assigned for moderate activities, and 8 METs are assigned for vigorous activities. Classification was done after data collection, the total physical activity score into one of the following categories:

Low: < 600 MET-min/week. A person who does not fulfill the given criteria.

Moderate: 600-3000 MET-min/week. A person who does not fulfill the high category level, but who engages in at least 20 minutes of vigorous intensive exercise daily for three or more days, 30 minutes of moderately intense activity daily for five or more days, or 600 MET minutes of walking combined with moderate or vigorously intense activity weekly for five days or more.

High: > 3000 MET-min/week. A person who walks in addition to engaging in moderate-to-intense physical activity for 3,000 MET-minutes a week for more than a week, or who engages in vigorous-intense activity for 1500 METminutes/work for three days.

General physical Health Questionnaire was used to assess Mental Health status: scoring was done by likert grading system.

According to MICHAEL H. BANKS ET AL, research shows that GHQ-12 shows strong psychometric properties, showed by its high internal consistency and unidimensional factor structure across three distinct samples. While the various scoring methods show equivalent results in this regard, the Likert

method is preferable for studies employing parametric multivariate analyses, as its distribution more closely resembles a normal distribution. Out of 240 Participants 174 (72.5%) were male, and 66 (27.5%) were female. This distribution suggesting a male dominant sample. The data analysis was performed using appropriate descriptive and inferential statistical methods. Descriptive statistics, including mean and standard deviation, were used to summaries continuous variables such as age, height, weight, various components of physical activity (vigorous, moderate, walking, transport), sitting time, and General Health Questionnaire (GHQ) scores. The Chi-square test of independence and Co relation analysis was used to determine the relationship between physical activity levels and mental health status, as well as gender-wise distribution across mental health and activity categories. P value was statistically significant below 0.05. The mean age of the participants was 45.08 ± 6.73 years, showing a middle-aged sample with low age variability.

On physical activity, participants reported spending an average of 1631.62 ± 748.47 MET-min/week on vigorous activities, and 818.63 ± 646.96 MET-min/week on moderate-intensity tasks. Time spent on active transportation (e.g., walking or cycling) averaged 240.23 ± 162.89 METmin/week, while leisure walking was 487.90 ± 144.02 MET-min/week.

Participants reported an average of 83.83 ± 41.59 minutes per day of sitting time, which is a useful marker for sedentary behavior. The total physical activity, summing all MET scores, was 3262.22 ± 1063.35 MET-min/week, reflecting an overall moderate to high activity level in the cohort. In a study conducted by Singh et al., the average total physical activity, measured in MET minutes per week, was 625.6 for third-year students, 786.3 for final-year students, and 296.5 for both interns and faculty members. Statistically significant differences were seen among the various groups. Finally, the General Health Questionnaire (GHQ) score, a measure of psychological well-being, averaged 11.78 ± 5.94 , suggesting moderate psychological distress among some participants.

Conclusion:

- The present research suggests that physical activity is strongly associated with Mental Health.
- Daily habit of being physical active have significant impact to prevent or decrease future health complications.
- physical activity can serve as a critical tool to reduce symptoms of anxiety, depression, and burnout.
- Physical activity not only improves mood and cognitive function but also promotes better sleep and stress Management.
- Encouraging and facilitating physical activity in the security industry can lead to healthier, more resilient personnel and enhance both individual well-being and job performance

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