REDVET - Revista electrónica de Veterinaria - ISSN 1695-7504
Vol 25, No. 1 (2024)
http://www.veterinaria.org
Article Received: Revised: Accepted:

Physical Activity and Cognition in Relation to Nomophobia Among Young Adults: A Correlation Study

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ABSTRACT

Background: Long-term use of smartphones has been linked to a number of negative health effects, such as an increased risk of musculoskeletal pain, anxiety, depression, and poor sleep, as well as fatigue and obesity or overweight. The link between physical activity and cognition in regard to nomophobia in young adults is the main focus of these health concerns. Nomophobia also creates anxiety that interferes with day-to-day functioning.

Study design: A Correlation Study

Aim & Objective: To find out the relationship of nomophobia with physical activity and cognition among young adults using Nomophobia questionnaire (NMP-Q), Montreal cognitive assessment (MOCA) and International physical activity questionnaire (IPAQ).

Participants: In this study total 85 participants were included in the study based on the inclusion and exclusion criteria. The participants included are young adults between the age group of 18-30 years and who are smartphone users. As per the exclusion criteria individual who have orthopedic limitation, cognitive impairment and neurological condition were excluded.

Method: Participants were assessed for Nomophobia, Cognition and Level of physical activity using Nomophobia questionnaire (NMP-Q), Montreal cognitive assessment (MOCA) and International physical activity questionnaire (IPAQ).

Result: The descriptive statistics for nomophobia questionnaire (NMP-Q), Montreal cognitive assessment (MOCA) and international physical activity questionnaire (IPAQ) are presented, For the NMP-Q dataset, the mean value is 74.96, with a standard error of 1.48, a standard deviation of 13.67, and a sample variance of 186.82. In MOCA the mean was 28.12, with a very small standard error of 0.12, a standard deviation of 1.08, and a sample variance of 1.18. The IPAQ dataset shows a mean of 1491.95, a standard error of 164.43, a high standard deviation of 1516.00, and a very large sample variance of 2298245.09. The correlations between Nomophobia questionnaire and Montreal cognitive assessment, we observe a Pearson correlation of -0.064, indicating a very weak negative linear relationship. The associated Sig. (2-tailed) value is 0.561, which is not statistically significant. The number of participants (N) for this pair is 85. For the correlation between Nomophobia Questionnaire and International Physical Activity questionnaire, the Pearson correlation is 0.024, signifying a very weak positive linear relationship. The Sig. (2tailed) value is 0.828, also indicating a lack of statistical significance. There are 85 participants for this pair as well.

Conclusion: In conclusion, the correlation analysis of the variables **Nomophobia Questionnaire, Montreal cognitive Assessment and International Physical Activity Questionnaire** reveals predominantly weak and non-significant relationships between most pairs of variables, with Pearson correlation coefficients close to zero and p values well above the typical threshold for significance. Specifically, the correlations between NMP-Q and MOCA, NMP-Q and IPAQ were all found to be weak and not statistically significant.

Keywords: NOMOPHOBIA, PHYSICAL ACTIVITY, COGNITION

INTRODUCTION:

Young adulthood is the transitional stage, between adolescence and maturity, [1]. The unique developmental stage of young adulthood, which spans the ages of 18 to 30, includes important developmental activities that enable the young adult to engage in identity building and self-discover.[2]

Since most homes, schools, workplaces, and institutions now have access to and use digital and Internet media, along with mobile phones and other portable devices, the way that minors interact with one another and share information has changed significantly from how adults used to relate to one another (Caron & Caronia 2007). Communication and education are two crucial aspects of children's socialization that are impacted by media availability during childhood and adolescents [3].

All age groups can become addicted to smartphones, but research suggests that teens and young adults may be especially vulnerable. Between 10% to 67% of kids, teens, and young adults worldwide suffer from smartphone addiction (SA). In India, between 24.6% and 44% of teenagers and young adults suffer from SA. Long-term use of smartphones or SA has been linked to a number of negative health effects, such as an increased risk of musculoskeletal pain, anxiety, depression, and poor sleep, as well as fatigue and obesity or overweight [4]. The link between physical activity and cognition in regard to nomophobia in young adults is the main focus of these health concerns.[4]

Discomfort, anxiety, anxiousness, or agony brought on by not having access to a cell phone is known as nomophobia [5]. When people are removed from their smartphones, they may feel anxious or afraid. Nomophobia is another name for this unpleasant emotion that is prevalent in modern culture as a result of the widespread usage of smartphones. Common symptoms of nomophobia include anxiety, disorientation, tachycardia, agitation, respiratory changes, sweating, and shaking. Nomophobia creates anxiety that interferes with day-to-day functioning. Additionally, nomophobia can lead to issues in one's social life because people may only try to make friends on social media, which would repress their emotional needs and usually result in a shallow friendship [6].

"The mental action or process of acquiring knowledge and understanding through thought, experience, and the senses" is the definition of cognition. Here at Cambridge Cognition, we define it as the mental operations involved in taking in, storing, and using information to direct behavior. Essentially, it is the capacity to see and respond, process and comprehend, store and retrieve information, make judgements, and generate suitable answers.[7] Physical activity is defined by the WHO as any skeletal muscle-driven movement of the body that demands the use of energy.[8]

There are important connections between physical exercise, intellect, and nomophobia. Frequent exercise improves cognitive abilities including memory and focus by lowering stress and boosting blood flow to the brain. Additionally, it serves as a constructive diversion from nomophobia, the worry and distraction caused by the dread of being without a cell phone, which can affect cognitive function. On the other hand, by raising stress and cognitive load, nomophobia might have a detrimental effect on cognition. By lowering anxiety and offering a respite from screens, physical activity can counteract these impacts and enhance mental health. All things considered, encouraging a healthy balance between physical exercise and thoughtful phone use management can improve cognitive function and lessen nomophobia. [9]

Therefore, in this study the aim is to assess physical activity, cognition and nomophobia among youthful grown-ups. This study fills a critical gap in the being literature and give practicable perceptivity for perfecting the health and well-being of youthful grown-ups in the digital age.

METHODOLOGY:

A total of 85 participants were including in the study through convenient sampling. Study was taking place at Santosh college of Occupational therapy college, Ghaziabad.

As per inclusion criteria healthy young adults age between 19 to 30 years, both male and female and the individual with smartphone user and willing to participate in the study were included. As per the exclusion criteria individual who have orthopedic limitation, cognitive impairment and neurological condition were excluded.

Outcome measures:

1. **Nomophobia Questionnaire (NMP-Q):** Participants' level of NMP was assessed using the NMP-Q scale, which had 20 questions and four dimensions: losing connectivity, giving up convenience, not being able to communicate, and not being able to access information. Responses were recorded on a 7-point scale, with 1 denoting "strongly disagree" and 7 denoting "strongly agree. "The scores were divided into four categories: mild (21–59), moderate (60– 99), severe (100–140), and no NMP (20). In this study, participants with scores of 20 or lower were classified as "without nomophobia," whereas those with values higher than 20 were classified as "with nomophobia." The reliability and internal validity values of the NMP-Q dimensions are between 0.78 and 0.92.[9]
2. **Montreal Cognitive Assessment:** Through the evaluation of a broad range of cognitive functions, including (i) short-term memory, (ii) executive functions, (iii) visuospatial abilities, (iv) language, (v) attention, concentration, and working memory, and (vi) temporal and spatial orientation, the MoCA is a screening tool that enables a global cognitive measurement. Nasiruddin and associates, 2005. A score of 26 or above on the MoCA is found to be as normal, with a maximum score of 30 points. Cognitive impairment may be indicated by scores below 26. Cronbach's alpha was 0.79 and the inter-rater reliability value was 0.96. The Montreal Cognitive Assessment's area under the curve is 0.89, while the ideal cutoff value was ≤21[10]
3. **International physical activity questionnaire:** The IPAQ is a seven-item self-reported physical activity assessment tool used with individual adult patients between the ages of 15 and 69. In order to estimate overall physical activity in MET minutes per week and time spent sitting, this measure evaluates the types of physical activity and sitting time that people engage in on a daily basis. Higher levels of physical activity are indicated by higher scores. Recall bias and subjective reporting are two of the IPAQ's drawbacks, despite its widespread usage and validation across a range of demographics. The dependability value is strong (α<.80).[11]

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DATA COLLECTION:
A total of 85 participants were included in the correlational study through convenient sampling
as per the inclusion and exclusion criteria. The procedure was explained to all the participants prior to the study. The return informed consent and covering letter was circulated among all the participants.
Participate in the study has filled their demographic data. They were further assessed for Nomophobia using Nomophobia Questionnaire, Cognition using Montreal Cognitive Assessment and Physical Activity by International Physical Activity Questionnaire. The information and the results of Nomophobia Questionnaire and Physical Activity and Montreal Cognitive Assessment were further recorded and correlated to receive the outcome of association between them.

DATA ANALYSIS:
After completion of all evaluation, results were collected, and data were put in the master chart and analyzed by using IBM SPSS. The scoring of outcome measures NOMOPHOBIA QUESTIONNAIRE, MONTREAL COGNITIVE ASSESSMENT AND INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE were analyze using IBM SPSS for statistical significance result.

RESULT
The master chart showing the detailed individual score in the outcomes measure, Nomophobia Questionnaire, Montreal Cognitive Assessment and International Physical Activity Questionnaire of Healthy Young Adults.

Table 1.0: Shows the demographic characteristics of Young Adults.

S.NO	Baseline characteristics	Participants
1.	No. of Participants	85
2.	Age Range (years)	19-30
3.	Gender (M/F)	41/44

Table 1 shows the demographic characteristics; The number of participants is 85; the age range of all the participants is between the 19-30 years. The numbers of male and female are 41 and 44 respectively.

Table 2.0 Shows the descriptive statistics of Nomophobia Questionnaire, Montreal Cognitive Assessment and International Physical Activity Questionnaire

	NOMOPHOBIA QUESTIONNAIRE	MONTREAL COGNITIVE ASSESSMENT	INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE
MEAN	74.96	28.12	1491.95
STANDARD ERROR	1.48	0.12	164.43
STANDARD DEVIATION	13.67	1.08	1516.00
SAMPLE VARIANCE	186.82	1.18	2298245.09

Table 2 shows the descriptive statistics of Nomophobia Questionnaire in which the mean value is 74.96, with a standard error is 1.48, a standard deviation is 13.67, and a sample variance is 186.82. Montreal cognitive assessment, the mean is 28.12, with a very small standard error of 0.12, a standard deviation of 1.08, and a sample variance of 1.18. The International Physical Activity Questionnaire dataset shows a mean of 1491.95, a standard error of 164.43, a high standard deviation of 1516.00, and a very large sample variance of 2298245.09.

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Figure 1.0 Shows the Descriptive Statistics of Nomophobia Questionnaire, Montreal Cognitive Assessment and International Physical Activity Questionnaire

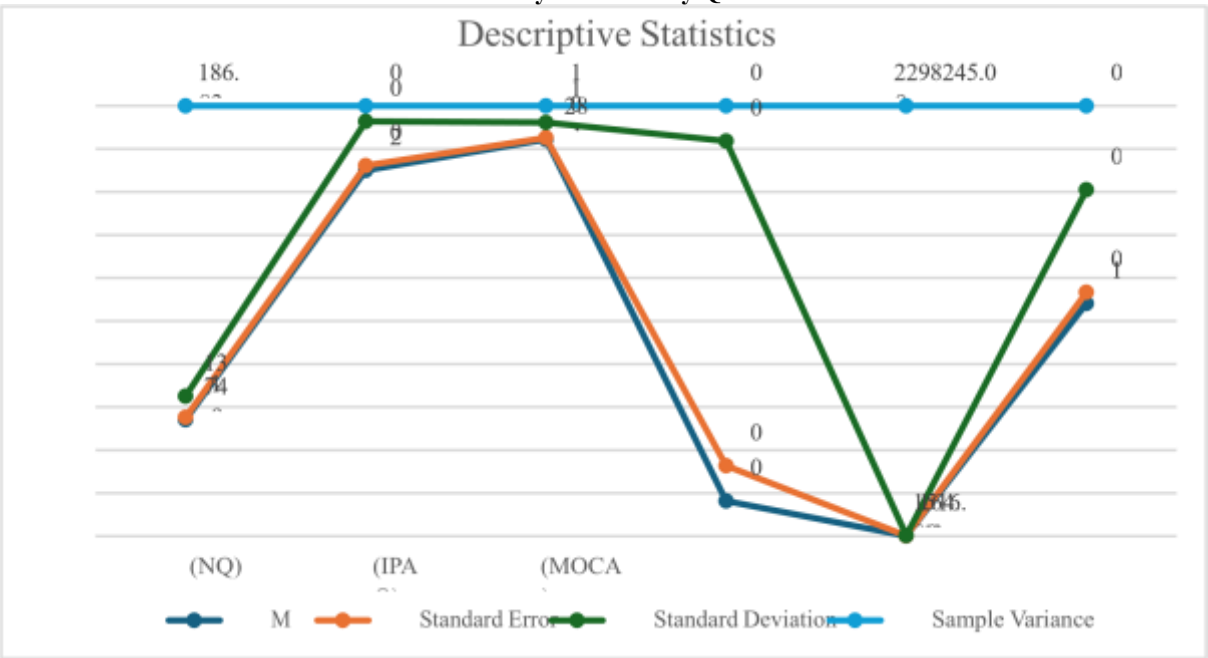

Table 3.0 Shows the Pearson Correlations Coefficient between the Nomophobia Questionnaire and Montreal Cognitive Assessment

	NOMOPHOBIA QUESTIONNAIRE	MONTREAL COGNITIVE ASSESSMENT
PEARSON CORRELATION COEFFICIENT	1	-.064
SIGNIFICANCE VALUE (Sig.2-tailed)		.561
N	85	85

Table 3 shows the Pearson correlation coefficient between the Nomophobia Questionnaire and Montreal Cognitive Assessment which is -0.064, reflecting a very weak negative linear relationship, with a non-significant p-value of 0.561.

Figure 2.0 Represent the Pearson Correlation Coefficient between the Nomophobia Questionnaire and Montreal Cognitive Assessment.

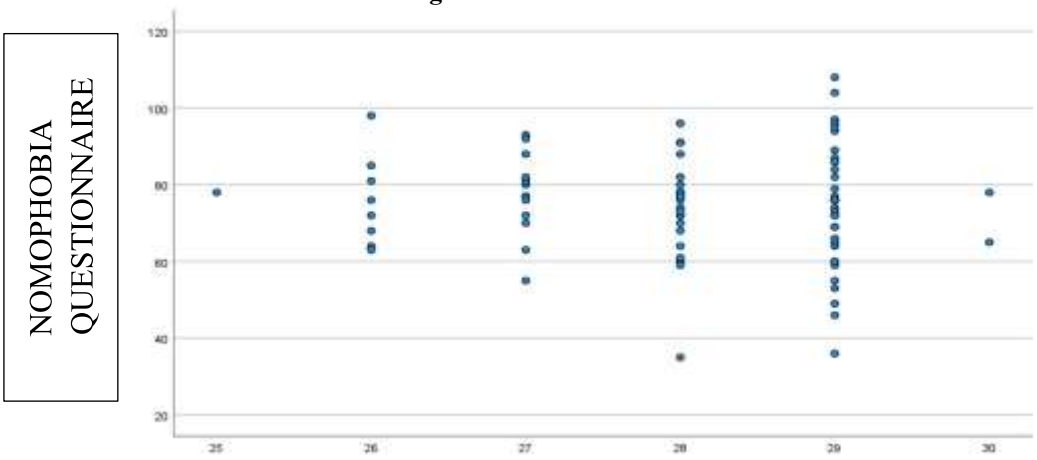

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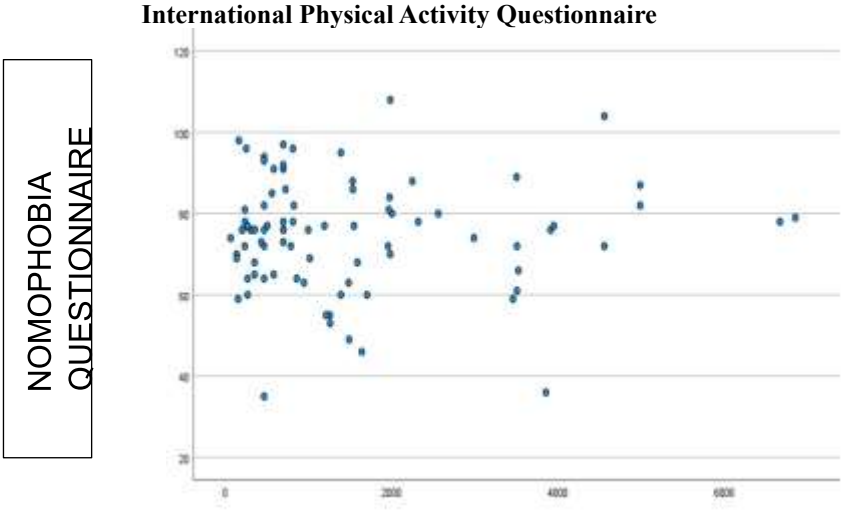
Table 4.0 Shows the Pearson Correlations Coefficient between the Nomophobia Questionnaire and International Physical Activity Questionnaire

	NOMOPHOBIA QUESTIONNAIRE	INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE
PEARSON CORRELATION COEFFICIENT	1	0.024
SIGNIFICANCE VALUE (Sig.2-tailed)		.828
N	85	85

Table 4 shows the Pearson correlation coefficient between the Nomophobia Questionnaire and International Physical Activity Questionnaire which is 0.024, reflecting a very weak positive linear relationship, with a significant p-value of 0.828.

Figure 3.0 Represent the Pearson Correlation Coefficient between the Nomophobia Questionnaire and International Physical Activity Questionnaire



DISCUSSION:

The present study explores the physical activity and cognition in relation to nomophobia among young adults.

In this study, 85 young adults were recruited from the Siyana Bulandshahr as per the inclusion and exclusion criteria and were detailed about the study. The informed consent was signed by the participants and demographics form was also filled by them. Nomophobia questionnaire is used for nomophobia, International physical activity (short form) to assess physical activity and Montreal cognitive scale for cognition. The data is collected and analyzed.

In the previous study authors studied how adolescent lifestyle profiles mediated the association between smartphone addiction and health-related quality of life in Philippine senior high school students, comparing male and female students. Their findings showed a strong and negative correlation between adolescent lifestyle profiles and health-related quality of life and smartphone addiction.[12]

The study examined the physical activity and cognition in relation to nomophobia among young adults.

In this correlation study the descriptive statistics for nomophobia questionnaire, Montreal cognitive assessment and international physical activity questionnaire are presented, For the NMP-Q dataset, the mean value is 74.96, with a standard error of 1.48, a standard deviation of 13.67, and a sample variance of 186.82. This indicates that the data points are, on average, 74.96 units from the reference point, with some variability indicated by the standard deviation and variance. MOCA the mean is 28.12, with a very small standard error of 0.12, a standard deviation of 1.08, and a sample variance of 1.18, indicating tightly clustered data around the mean. The IPAQ dataset shows a mean of 1491.95, a standard error of 164.43, a high standard deviation of 1516.00, and a very large sample variance of 2298245.09, indicating substantial variability in the data points as shown in the table no.2.

The correlation analysis among three sets of variables— **Nomophobia Questionnaire, Montreal cognitive Assessment and International Physical Activity Questionnaire** are outlined, including Pearson correlation coefficients, significance values, and the number of observations. Pearson's correlation coefficient measures the strength and direction of the linear relationship between pairs of variables, ranging from -1 to 1. A coefficient of 1 indicates a perfect positive linear

relationship, -1 denotes a perfect negative linear relationship, and 0 signifies no linear relationship. The significance value (Sig. 2-tailed) provides the p-value associated with the correlation coefficient, with values below 0.05 typically suggesting statistical significance.

For NMP-Q and MOCA, the Pearson correlation is -0.064, reflecting a very weak negative linear relationship, with a non-significant p-value of 0.561. Both variables have 85 observations as shown in the table no.3.

However, A study findings also showed a negative link between Nomophobia scores and Metacognition and Arousal, no correlation with Extraversion, and a positive correlation with Anxiety, Depression, Stress, Fatigue, Regression, and Guilt.[13]

A study also suggests that approximately 80% of nursing students reported having nomophobia, according to the study. There were notable variations in nomophobia ratings according to primary smartphone usage and gender. However, no statistically significant difference in mean nomophobia ratings between strong and weak students was found, nor was there a significant correlation between nomophobia scores and academic achievement.[14]

The correlation between NMP-Q and IPAQ is 0.024, showing a very weak positive linear relationship, also with a non-significant p-value of 0.828 as shown in the table no.4.

Some factors which can influence the study being examined and the DASS-12 was identified as a secondary 3-factor scale by the exploratory and confirmatory factor analyses. The measuring model's findings confirmed that every DASS-12 item was appropriate and reliable in capturing the underlying components. Physical activity and nomophobia were found to positively correlate with stress, anxiety, and depression, according to structural model analysis. Furthermore, the association between nomophobia and two aspects of distress—stress and anxiety—was found to be moderated by physical exercise. Lastly, this study demonstrated that the relationships between nomophobia and stress and between nomophobia and anxiety are moderated by physical activity.[15]

An example of a state school is the risk of physical activity and smartphone addiction among high school athletes. Additionally, a favorable correlation between physical activity and nomophobia risk was discovered.[15]

CONCLUSION:

In conclusion, the correlation analysis of the variables Nomophobia Questionnaire, Montreal cognitive Assessment and International Physical Activity Questionnaire reveals predominantly weak and non-significant relationships between most pairs of variables, with Pearson correlation coefficients close to zero and p values well above the typical threshold for significance. Specifically, the correlations between NMP-Q and MOCA, NMP-Q and IPAQ were all found to be weak and not statistically significant.

LIMITATION OF THE STUDY:

- The limited regions and institutions involved.
- In addition, because it is a correlational study, it cannot observe the changes varying on variables over time.

FUTURE RECOMMENDATION:

Future research could be done with a larger sample size and further research could be conducted from various places for data collection.

ACKNOWLEDMENT:

I express my gratitude to the following individuals for their assistance and involvement in this project: Dr. P. Mahalingam, Chairman and Vice Chairman of Santosh Medical College, Santosh College of Occupational Therapy, Ghaziabad; Dr. R. K. Sharma, Dean, Paramedical & Principal Santosh occupational therapy college; Dr. CHHAVI KALRA, Assistant Professor and Dr. POONAM RANI, Assistant Professor, Santosh Occupational therapy college and the participants who participated in the study. Thank you also to my parents and God for their blessings. These people provided direction and encouragement, which made the endeavor possible.

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