The Relationship between Physical Activity, Eating Disordered and Obesity as Predictors of Poor Quality of Life in College Students of District Bahawalnagar

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Abstract

The benefits of regular physical activity extend across the spectrum of physical, psychological, and social dimensions, offering a comprehensive approach to overall well-being. Engaging in physical activity has emerged as a critical factor associated with prolonged and healthier lives, particularly among college students. This study aimed to examine the relationship between physical activity, eating disorders, and obesity as predictors of poor quality of life and determine the impact of physical activity on eating disorders and obesity as predictors of poor quality of life in college students. A quantitative, cross-sectional research design was used to gather the information from the participants. A total of 310 college student's male (59%) and female (41%) age between 18-25 years (21.66±1.86). The data was collected by using Physical Activity questionnaire, Eating Disordered and Poor Quality of life adopted survey questionnaire were used for data collection Statistics (Mean, SD) and Inferential Statistics (Correlation, Multiple regression) were used to analyze the data through SPSS V-26.0. The Mean and SD of Physical Activity was (1.96±.18), Eating Disordered was (4.79±.68), Obesity was (26.15±.86) and Poor Quality of life was (3.60±.71) measured. A correlation analysis among college students revealed significant relationships between various factors and quality of life. It emphasized the importance of physical activity, self-care, and healthy habits while addressing issues like pain, eating disorders, and obesity. The study concluded that investing in physical and mental health is essential for enhancing quality of life.

Keywords: Obesity, Eating disorder, Poor quality of life, Physical activity, Predictors

Introduction

The current research has been carefully developed to examine college students' everyday living activities, behaviors, lifestyles, food choices, and curricular and extracurricular activities. Regular physical activity has physical, psychological,

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as well as social benefits that improve overall well-being. Its health benefits are universal, regardless of age, gender, or occupation (Molanorouzi et al., 2018). Active living reduces the risk of cardiovascular disease, obesity, diabetes, and several cancers. These widespread benefits emphasize the necessity of everyday exercise (Guthold et al., 2018). Regular exercise has considerable psychological benefits as well as physical ones. Physical activity reduces anxiety, depression, and stress (Roy, 2018). Fitness becomes a powerful tool for mental health as people negotiate modern life. College students, who face academic and social pressures, are especially affected by this physical-mental health link (Deci & Ryan, 2022). According to Burnet (2021), college students who exercise regularly have lower stress, anxiety, and sadness. The intense academic environment and transitory young adulthood foster mental health issues. Physical activity prevents and manages college stress (Swain et al., 2019).

Engaging in physical activity has emerged as a critical factor associated with prolonged and healthier lives, particularly among college students. Despite the well-established benefits, a significant portion of the population fails to incorporate adequate physical activity into their routines, potentially missing out on the advantages it offers (Groessl et al., 2019). The World Health Organization (WHO) recommends that adults aged 18–64 engage in a minimum of 150 minutes of moderate-intensity physical activity, 75 minutes of vigorous-intensity activity, or an equivalent combination of moderate- and vigorous-intensity physical activity each week to attain optimal health benefits (Fuezeki et al., 2017).

Eating disorders severely harm students' physical, mental, and social health. Bulimia and anorexia are very common in students. These disordered eating, weight, and shape attitudes can harm physical and mental health (Jenkins et al., 2020). Bulimia involves binge-eating and purging, whereas anorexia involves self-imposed fasting due to a fear of gaining weight. The prevalence of these disorders is notably higher in student, pointing to the vulnerability of this demographic. Disturbingly, reports indicate that these disorders are approximately three times more prevalent in females than males, underscoring the gendered nature of their occurrence (Talmon & Widom, 2022). Eating disorders are very harmful to the heart. Cardiovascular health is threatened by heart rhythm disorders, electrolyte imbalances, and weakening cardiac muscles (Arcelus et al., 2021). Gastroparesis and delayed stomach emptying impair nutrition uptake (Bulik et al., 2017). Purging linked with some illnesses corrodes teeth and mouths and reduces bone density, making bones more susceptible to fractures (Klatzkin et al., 2018).

Moreover, the overall impact of eating disorders can extend to the development

of other diseases and as well the immune system may weaken, leaving individuals more susceptible to infections, and hormonal imbalances can disrupt various bodily functions (Treasure & Claudino, 2021). Recognizing the holistic toll of these disorders is crucial for devising comprehensive interventions that not only address the immediate behaviors but also prioritize the restoration of overall health. In this way, a nuanced understanding of the far-reaching consequences of eating disorders informs the development of effective strategies for both prevention and treatment (Watson & Bulik, 2020).

Obesity as a predictor of low quality of life in college students is a growing issue. Obesity significantly lowers quality of life across several areas (Puhl & Heuer, 2019). Fat college students have lower mobility, weariness, and a higher chance of health issues, which lowers their well-being. Psychologically, fat stigma may cause sadness and low self-esteem, lowering college students' quality of life. Obesity-related stigma can lead to social isolation, making it harder for students to make friends and lower their quality of life (Heuer et al., 2019). The relationship between overweight as well as inadequate standards of life is essential to developing successful college treatments. Higher education institutions shape student well-being (Brownell, 2003). Obesity affects students' psychological, physiological, and cultural health, hence a comprehensive strategy is needed. Obesity is linked to lower quality of life, highlighting the need for targeted therapies (Gortmaker et al., 2005). The significantly impact the quality of life for students struggling with obesity by implementing comprehensive and culturally sensitive interventions. Nutritional, mental health and physical activity needs, higher education institutions contribute to the holistic well-being of their student population. Keeping in view the current study aimed to focus the relationship between physical activity, eating disorders, and obesity as predictors of poor quality of life in college students of district Bahawalnagar presents a complex and pressing issue requiring comprehensive exploration. Therefore, the aim of this study is to examine the level of Physical activity, eating disordered and obesity as predictors of poor quality of life in college students and to measure the effect of Physical activity, eating disordered and obesity as predictors of poor quality of life in college students of district Bahawalnagar. Through dissemination of the study results, a greater understanding of the attitudes, habits, and behaviors of students in relation to these factors can be cultivated, fostering an environment of awareness and sensitivity. The study affects institutional policies and activities beyond individual consciousness and counseling. College officials can implement health, physical activity, including lifestyle policies and programs using evidence-based knowledge. These programs can promote healthy habits and well-being on campus. The research helps shape health policy to meet college students' physical

activity, eating disorder, and obesity needs and improve quality of life.

Methodology

Research Design

The research technique of the study including the research design, population and sample size, tool for the data collection, statistical techniques, and conclusion as well. The object of the research is to determine and investigate the relationship between physical activity, eating disordered and obesity as predictors of poor quality of life in college students of district Bahawalnagar. For this propose, three independent variables such as physical activity, eating disordered and obesity whereas, quality of life as a single outcome variable are executed in the current study.

Population

A population is made from the totality of all subjects that complies with a hard and fast of specifications comprising the complete group and to whom the studies outcomes can be generalized (Polit & Hungler, 1999). The population were contained both male and female students belonging to the District Bahawalnagar colleges of Punjab Province of the current study.

Sampling and Sample Size

Convenient sampling technique was employed to select samples. Reason behind the selection of convenient sampling was that only college male and female students were the part of the research. A sample represents as a component or a subset from the selected population to participate in a study (LoBiondo-Wood & Haber, 1998). The overall population of the research was comprised of 1375 students belongs to male and female colleges of district Bahawalnagar. The sample size was determined through the formula of Yamane (1973), the sampling size of 310 (309.85) male and female was obtained. Therefore, 330 questionnaire was distributed among 20 questionnaire was excluded in the final analysis due to inappropriate to meet the inclusion criteria. The final completely filled questionnaire was 310 in numbers.

Measurements

In research, particularly in survey-based studies, different types of measures are utilized to collect data. Demographics often contain details like age, gender, education level, departments, and playing experience in years. These variables give context and enable the examination of different groups of the participants. Whereas, independent variables are things that are classified to establish their impact on results; in the case of a questionnaire, these are Physical Activity, Eating Disorder, and Body Mass Index (BMI). These factors

are expected to impact the dependent variables, which are the outcomes being assessed. In this research dependent variable of Poor Quality of Life is the primary focus of the research and represent the impacts associated with changes in the independent variables. Collectively, these measurements help in understanding relationships, drawing conclusions, and making informed decisions based on the data gathered. The research is descriptive in nature, the questionnaires were used to collect responses from the respondents. These sections were finalized after in depth discussion from the experts in the field of sports sciences to meet the objectives of the study.

Demographic Information

In research the basic information regarding the population plays an important role to ascertain the authentic results. Therefore, in this research age, gender, residence, education department and playing experience of the participants was obtain and tabulated in the shape of mean and standard deviation.

Physical Activity Questionnaire

Physical Activity Questionnaire developed by Craig and his colleagues in year 2003 was used to get the responses to know about the level of physical activity of the participants in the study. Frequency and percentage of sub-scales of Mobility (5 items), Self-care (5 items), Usual activities (5 items), Pain and Discomfort (5 items), and Anxiety/ Depression (5 items) was also obtained to know their responses.

Eating Disordered Measurement Tool; Carter, Stewart & Fairburn, 2001.

Eating Disorder Questionnaire developed by Carter, Stewart & Fairburn in year 2001 was adopted to obtain the data from the participants. The questionnaire has 14 statements based on the seven-point Likert scale ranging from 0-6.

Body Mass Index (BMI)

Body Mass Index (BMI) is a numerical value obtained from an individual's weight and height that is often used to determine body fat and weight status. BMI is a simple and effective way to determine if someone is underweight, normal weight, overweight, or obese. A table developed by Kyle in year 2004 was used to assess the BMI of the participants. It is calculated by dividing a person's weight in kilograms by their height in meters squared (kg/m^2). While BMI is a useful tool for identifying potential weight-related health issues and tracking trends across populations, it has limitations. For example, it does not distinguish between lean and fat mass, nor does it account for variations in body composition caused by factors such as age, gender, or muscle mass.

Poor Quality of Life Tool; (Becker et al., 2010)

The term "poor quality of life" (Laudet et al., 2009) refers to a reduction in general well-being and life satisfaction caused by a variety of reasons. Physical health concerns, mental health challenges, socioeconomic obstacles, and a lack

of access to critical services or supporting connections are all possible contributors. Individuals with a poor quality of life frequently report lower levels of satisfaction, more stress, and a decreased capacity to complete everyday tasks. An adopted questionnaire developed by Becker et al. (2010) comprised of 10 items was used to get the responses of the dependent variable.

Table1*: Survey Instrument Metrics*

Survey Questionnaire	Items
Physical Activity	25 Items
Eating Disordered	14 Items
Quality of Life	10 Items
Obesity	BMI Table

Procedure

The data was collected from the both male and female students who were belonged to district Bahawalnagar colleges, Punjab Province. The researcher personally distributed all survey questionnaires in college students. Afterwards, the researcher met the male and female students, and briefed them about the objectives and purposes of the present research. They were told that the collected data will be utilized only for the purpose of Master of Philosophy research. Upon their satisfaction, the survey questionnaires were distributed among the male and female college students. The researcher also guided them where they needed in understanding the questionnaire. It would take 20 to 30 minutes to fill the survey questionnaires. At the end, all the respondents returned back filled survey questionnaires to the researcher.

Results

This chapter describes the basic information derived from analysis of each variable through descriptive statistics. The results of the present study measured and analyzed the impact of physical activity, eating disordered and obesity with quality of life. The present study was conducted with the aim to assess the relationship between physical activity, eating disordered and obesity with respect to quality of life by selecting the sample of 310. Data was collected from male and female students of the district Bahawalnagar colleges, Punjab. Statistical techniques such as descriptive statistics (mean, standard deviation, percentage, and frequency), Pearson's correlation analysis, regression and independent t test analysis were employed to analyze the collected data.

Table 2: ***Descriptive Statistics***

Items	N	Mean	SD
Physical Activity	310	1.96	.18
Eating Disordered	310	4.79	.68
Body Mass Index	310	26.15	.86
Quality of Life	310	3.60	.71

The above table shows the description of physical activity, eating disordered, body mass index and quality of life in college students. There is total 310 both male and female college students were participated in this study. While the mean of physical activity was 1.96±.18, eating disordered 4.79±.68, body mass index 26.15±.86 and quality of life 3.60±.71 measured.

Table 3: ***Normality Table***

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Physical Activity	.066	310	.002	.989	310	.975
Eating Disordered	.117	310	.000	.949	310	.623
Body Mass Index	.085	310	.000	.957	310	.575
Quality of Life	.164	310	.001	.922	310	.905

a. Lilliefors Significance Correction

The Kolmogorov-Smirnov and Shapiro-Wilk test was performed to test the normality of Physical Activity, Eating Disordered, Body mass index and Quality of life. Table 3 showed that the data of Physical activity, eating disordered, Body mass index and Quality of life variables was normal and suitable for the parametric test. The Sig. values of among variables were greater than the alpha value 0.05 which indicates that the data was normal.

Table 4: ***Correlation***

	Mobility	Self-Care	Usual Activity	Pain	Anxiety	Eating Disordered	BMI	Quality of Life
Mobility	1	.029	.115*	.053	.218**	.439**	.024	.257**
Self-care			.050	.180**	.133*	.167**	.106	.170**
Usual Activities				.114*	.195**	.449**	.065	.287**
Pain					.014	.188**	.022	.132*

Anxiety	.124*	.109	.097
Eating Disordered		.047	.641**
BMI			.220**
Quality of life			1

***. Correlation is significant at the 0.01 level (2-tailed).*
*P<.05**

The correlation table provides significant insights into the relationship between various factors and the quality of life among college students, particularly focusing on physical activity, eating disorders, and obesity. The data reveals that mobility (r =.257), self-care (r =.170), and the ability to perform usual activities (r =.287) are all positively correlated with a higher quality of life. This suggests that students who maintain better mobility, engage in self-care, and can carry out their usual activities tend to experience a better quality of life. Conversely, pain (r =.132), eating disorders (r=.641), and higher BMI (r=.220) are negatively correlated with quality of life, indicating that students suffering from pain, eating disorders, or higher BMI are likely to experience a poorer quality of life.

Table 5: ***Physical Activity***

Group Statistics				**Levene's Test for Equality of Variances**		**t-test**		
Gender	N	Mean	SD	F	Sig.	t	df	Sig. (2-tailed)
Female	124	1.94	.16	1.943	.161	-1.54	308	.124
Male	186	1.97	.19			-1.59	291	.112

The above show that comparison of physical activity between male and female. There were total 124 female college student participated in this study there mean was 1.94±.16 respectively there were total 186 male college student participated while the mean was 1.97±.19. The Leven's Test for Equality of Variances shows insignificant result (F=1.943 and Sig. =.161) in physical activity between male and female. Therefore the results shows that female physical activity is low as compared to male.

Table 6: ***Eating Disordered***

Group Statistics	**Levene's Test for Equality of Variances**	**t-test**

Gender	N	Mean	SD	F	Sig.	t	df	Sig. (2-tailed)
Female	124	4.66	.67	1.242	.002	-2.728	308	.007
Male	186	4.88	.71			-2.737	266.434	.007

The above show that comparison of eating disordered between male and female. There was total 124 female college student participated in this study their mean was 4.66±.67 respectively there were total 186 male college student participated while the mean was 4.88±.71. The Leven's Test for Equality of Variances shows significant result (F=1.242 and Sig.=.002) in eating disordered between male and female. Therefore, the results shows that female had no eating disordered behavior as compared to male.

Table 7: ***Body Mass Index***

Group Statistics				**Levene's Test for Equality of Variances**		**t-test**		
Gender	N	Mean	SD	F	Sig.	t	df	Sig. (2-tailed)
Female	124	26.15	.84	.332	.001	.021	308	.983
Male	186	34.29	.88			.022	272.056	.983

The above show that comparison of body mass index between male and female. There was total 124 female college student participated in this study their mean was 26.15±.84 respectively there were total 186 male college student participated while the mean was 34.29±.88. The Leven's Test for Equality of Variances shows significant result (F=.332 and Sig.=.001) in body mass index between male and female. Therefore, the results shows that female was low obese as compared to male.

Table 8: Quality of Life

Group Statistics	**Levene's Test for Equality of Variances**	**t-test**

Gender	N	Mean	SD	F	Sig.	t	df	Sig. (2-tailed)
Female	124	3.55	.73	.620	.002	-.866	308	.387
Male	186	3.63	.82			-.860	257.172	.391

The above show that comparison of quality of life between male and female. There was total 124 female college student participated in this study their mean was 3.55±.73 respectively there were total 186 male college student participated while the mean was 3.63±.82. The Leven's Test for Equality of Variances shows significant result (F=.620 and Sig.=.002) in quality of life between male and female. Therefore, the results shows that female was quality of life as compared to male.

Discussion

The existing research revealed that a variable physical activity had positive relationship with poor quality of life. This study provides significant insights into the relationship between various factors and the quality of life among college students, particularly focusing on physical activity, eating disorders, and obesity. The data reveals that mobility (r =.257), self-care (r =.170), and the ability to perform usual activities (r =.287) are all positively correlated with a higher quality of life. This suggests that students who maintain better mobility, engage in self-care, and can carry out their usual activities tend to experience a better quality of life.

Consisting with the finding of previous study the current study was also confirmed the relationship between eating disordered and poor quality of life. The relationship of the relationship between eating disordered and poor quality of life was significant at (p=.05) level. As stated in this chapter, it was important that positive result related significant relationship with poor quality of life. The research revealed that a variable obesity had relationship with poor quality of life. The association between obesity and poor quality of life was found good. Therefore, results were considered most significant at (p= .05) level.

The predicting factors predicted the poor quality of life and generating the regression model under regression analysis. According to the result of regression model, physical activity, eating disordered and obesity exposed significant impact on poor quality of life. Physical activity, eating disordered and obesity had positive impact poor quality of life among college students. The independent

constructs (physical activity, eating disordered, obesity) has a significant variance in the outcome variable (poor quality of life). Therefore, physical activity, eating disordered and obesity variables had strong impact on college student's quality of life. The results of the current study of significant of physical activity variables with quality of life in college students. Therefore, the results revealed that the strong relationship existing in physical activity and quality of life (Shariff et al., 2017).

Therefore, the results were significant and positive correlation between physical activity variable. The reason behind the significant relationship between physical activity and quality of life may be that college students were fully or partially connected by some regular exercises, some training. The result was supported by the finding of Camparaet al. (2012). Similar result was concluded by the study of Shariff et al. (2017). The previous study Kumar, et al. (2014) also concluded that the positive and significant relationship between physical activity and quality of life. The findings were supported by the research of Karcher (2002). The prior research of Karcher (2005) also supported that the positive and significant relationship between physical activity and quality of life.

The obtained results of current research revealed the significant relationship between eating disordered with poor quality of life. The reason behind the significant and positive relationship between eating disordered and poor quality of life may be that college students showed less eating disordered in male than females during the passage of play. The results of the existing study were significant (p= .05). The study results were found medium. The results were concluded by Ravindra (2015) that the eating disordered had positive significant relationship with quality of life. The similar was received by the study conducted by Wang, Wu, and Liu (2003) that eating disordered was significantly correlated to quality of life.

The study of Kumar, et al. (2014) also concluded that the positive and significant relationship between eating disordered and quality of life. The results were supported by the study of Shariff et al., 2017). The research supported the results conducted by Karcher (2011) that eating disordered had significant relationship with quality of life. The results of the existing study of significant of obesity variables with quality of life in college students. Therefore, the results revealed that the strong relationship existing in obesity and quality of life (Diao et al., 2020).

Therefore, the results were significant and positive correlation between obesity variable. The reason behind the significant relationship between obesity and quality of life may be that college students were not participated in sports and games. The result was supported by the finding of Guthold et al. (2018). The

previous study Kumar, et al. (2016) also concluded that the positive and significant relationship between obesity and quality of life. The findings were supported by the research of Karcher (2002). The prior research of Karcher (2005) also supported that the positive and significant relationship between obesity and quality of life.

Conclusion

The study confirmed that physical activity, eating disorders, and obesity are significantly related to quality of life, reflecting similar patterns observed in earlier studies. The data revealed that physical activity, eating disorders, and obesity each have moderate to strong associations with quality of life. Regular exercisers have a higher quality of life than those with eating disorders or obesity. These characteristics were major determinants of the study participants' quality of life. Physical activity improved quality of life, while the presence of obesity and eating disorders decreased it. This study emphasizes the importance of being active and the negative impact of weight gain and eating disorders on quality of life.

These findings suggest that public health programs to promote physical activity along with tackling obesity and eating problems can improve quality of life. A qualified trainer is essential for creating and implementing physical exercise regimens, together with psychological assistance. These programs should focus on eating problems, obesity, and college student quality of life. Practitioners and researchers can better understand how physical exercise affects college students' quality of life by constantly tracking these characteristics.

References

Arcelus, J., Mitchell, A. J., Wales, J., & Nielsen, S. (2021). Mortality rates in patients with anorexia nervosa and other eating disorders: A meta-analysis of 36 studies. *Archives of General Psychiatry, 68*(7), 724–731.

Becker, M. A., Boaz, T. L., Andel, R., Gum, A. M., & Papadopoulos, A. S. (2010). Predictors of preventable nursing home hospitalizations: the role of mental disorders and dementia. *The American Journal of Geriatric Psychiatry*, *18*(6), 475-482.

Brownell, K. D. (2003). Diet, obesity, public policy, and defiance. In R. J. Sternberg (Ed.), *Psychologists defying the crowd: Stories of those who battled the establishment and won* (pp. 47–64). American Psychological Association. https://doi.org/10.1037/10483-003

Bulik, C. M., Berkman, N. D., Brownley, K. A., Sedway, J. A., & Lohr, K. N. (2017). Anorexia nervosa treatment: A systematic review of randomized

controlled trials. *International Journal of Eating Disorders*, *40*(4), 310–320.

Burnet, J. E. (2021). Women have found respect: Gender quotas, symbolic representation, and female empowerment in Rwanda. *Politics & Gender*, *7*(3), 303-334.

Deci, E. L., & Ryan, R. M. (2002). *Overview of self-determination theory: An organismic dialectical perspective. Handb. Self-Determ. Res. 2*, 3–33.

Diao, H., Wang, H., Yang, L., & Li, T. (2020). The impacts of multiple obesity-related interventions on quality of life in children and adolescents: a randomized controlled trial. *Health and quality of life outcomes*, *18*, 1-9.

Fuezeki, E., Engeroff, T., & Banzer, W. (2017). Health benefits of light-intensity physical activity: A systematic review of accelerometer data of the national health and nutrition examination survey (NHANES). *Sports Med. 47*, 1769–1793.

Gortmaker, S. L., Lee, R., Cradock, A. L., Sobol, A. M., Duncan, D. T., & Wang, Y. C. (2012). Disparities in youth physical activity in the United States: 2003–2006. *Medicine & Science in Sports & Exercise*, *44*(5), 888-893.

Groessl, E.J., Kaplan, R.M., Rejeski, W.J., Katula, J.A., Glynn, N.W., King, A.C., & Spring, B. (2019). Physical activity and performance impact long-term quality of life in older adults at risk for major mobility disability. *Am. J. Prev. Med. 56*, 141–146.

Guthold, R.; Stevens, G.A.; Riley, L.M.; Bull, F.C. Worldwide trends in insufficient physical activity from 2001 to 2016: A pooled analysis of 358 population-based surveys with 19 million participants. Lancet Glob. Health 2018, 6, e1077–e1086.

Heuer, O. E., Kruse, H., Grave, K., Collignon, P., Karunasagar, I., & Angulo, F. J. (2019). Human health consequences of use of antimicrobial agents in aquaculture. *Clinical Infectious Diseases*, *49*(8), 1248-1253.

Jenkins PE, HosteRR, MeyerC, BlissettJM. Eating disorders and quality of life: A review of the literature. *Clin Psychol Rev 2020*;31:113-21.

Karcher, M. J. (2005). The effects of developmental mentoring and high school mentors' attendance on their younger mentees' self-esteem, social skills, and connectedness. *Psychology in the Schools*, *42*(1), 65-77.

Karcher, M. J., & Nakkula, M. J. (Eds.). (2011). *Play, Talk, Learn: Promising Practices in Youth Mentoring: New Directions for Youth Development, Number 126* (Vol. 116). John Wiley & Sons.

Karcher, M. J., & Oberhuber, J. M. (2002). Pathways and modification of the upper and intermediate waters of the Arctic Ocean. *Journal of Geophysical Research: Oceans*, *107*(C6), 2-1.

Klatzkin, R. R., Gaffney, S., Cyrus, K., Bigus, E., & Brownley, K. A. (2018). Attachment, emotion regulation, childhood abuse, and assault: Examining predictors of binge eating in a clinical sample. Eating Behaviors, 29, 38–43.

Kumar, K., Dasgupta, C. N., & Das, D. (2014). Cell growth kinetics of Chlorella sorokiniana and nutritional values of its biomass. *Bioresource technology*, *167*, 358-366.

Kumar, V., & Reinartz, W. (2016). Creating enduring customer value. *Journal of marketing*, *80*(6), 36-68.

Laudet, A. B., Becker, J. B., & White, W.L. (2009). Don't wanna go through that madness no more: Quality of life satisfaction as predictor of sustained remission from illicit drug misuse. Substance Use & Misuse, 44(2), 227–252.

Liu, R. H. (2003). Health benefits of fruit and vegetables are from additive and synergistic combinations of phytochemicals. *The American journal of clinical nutrition*, *78*(3), 517S-520S.

LoBiondo-Wood, G., & Haber, J. (1998). Introduction to design. *Nursing Research: Methods, Critical Analysis, and Utilization*, 202-205.

Molanorouzi, K.; Khoo, S.; Morris, T. Motives for adult participation in physical activity: Type of activity, age, and gender. BMC Public Health 2018, 15, 66.

Polit, D.F. & Hungler, B.P. (1999). Nursing research: principles and methods. 6th Ed. [Online]. Philadelphia: J.B. Lippincott. Available from: https://books.google.co.in/books/about/Nursing_Research.html?id=CDRtAAAAMAAJ.

Puhl, R. M., & Heuer, C. A. (2019). The stigma of obesity: A review and update. Obesity, 17(5), 941–964.

Ravindra, P. (Ed.). (2015). *Advances in bioprocess technology*. Cham, Switzerland: Springer International Publishing.

Roy, A. Effect of Imagery on Passion for Physical Activity in Individuals with Type 2 Diabetes. Doctoral's Dissertation, University of Malaya, Kuala Lumpur, Malaysia, 2018.

Shariff, A., Bonnefon, J. F., & Rahwan, I. (2017). Psychological roadblocks to the adoption of self-driving vehicles. *Nature Human Behaviour*, *1*(10), 694-696.

Swain, D.; Franklin, B.; Williams, P.; Lee, I.M. Cardioprotective Benefits of Vigorous Physical Activity: The Risk Benefit Issue. Med. Roundtable Cardiovasc. Ed. 2019, 1, 167–175.

Talmon A, Widom CS. Childhood maltreatment and eating disorders: A prospective investigation. Child Maltreat 2022; 27:88-99.

Watson, H. J., & Bulik, C. M. (2020). Update on the treatment of anorexia nervosa: Review of clinical trials, practice guidelines, and emerging interventions. Psychological Medicine, 43(12), 2477–2500.

Yamane, T. (1973). Statistics: An introductory analysis.