



Assessment Of Health Promoting Lifestyle Practices And Mental Health Status Among Apparently Healthy Undergraduate Students Of A Premier Indian University During The COVID-19 Lockdown

¹Dr. Anita Gupta, PhD Scholar, Department of Physiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi – 221005, UP, India

²Dr. Ravindran Revand, Junior Resident (Academic) Department of Physiology Institute of Medical Sciences Banaras Hindu University Varanasi – 221005, UP, India

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Corresponding Author: Dr. Ravindran Revand, Junior Resident (Academic) Department of Physiology Institute of Medical Sciences Banaras Hindu University Varanasi – 221005, UP, India

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ABSTRACT

Introduction

Health promoting lifestyle practices (HPLP) are upcoming areas of healthcare physiological sciences which are known to yield significant preventive and therapeutic modalities for numerous somatic and psychological infirmities. Objectives: The present novel study was designed to assess the differences in the HPLP between apparently healthy male and female undergraduate students of an Indian university and to find out the relationship between HPLP and mental health (MH) status during the socially stressful COVID-19 lockdown period between March 2020 and August 2020. Methodology: In our present work, apparently healthy students (100 male and 100 female) pursuing their undergraduate degree in various faculties of

Banaras Hindu University, Varanasi, India were recruited. They were asked to fill the standard HPLP and MH Inventory questionnaires in a supervised environment through online platform, after which dimension-wise HPLP and MH scorings were done and results were analyzed. Results: Our observations show that female students possessed better HPLP and MH status as compared to their male counterparts. Female subjects have scored more than the male subjects in HPLP dimensions like health responsibility, physical activity, nutrition and stress management and in MH dimensions like positive self-evaluation, integration of personality, group oriented attitude and environmental competence. In both gender groups, the HPLP were positively correlated with MH status and vice versa.

Conclusion: The present work gives valuable insights regarding the beneficial effects of HPLP towards improving MH status in a potentially stressful social environment.

KEYWORDS

Health promotion; Lifestyle practices; Mental health; COVID-19 pandemic; Lockdown; Stress

INTRODUCTION

Health promoting lifestyle practices (HPLP) are key preventive and therapeutic modalities for fostering individual and social well-being, treating multiple psychopathologies and for optimizing and preserving cognitive functions. HPLP are very much undervalued and underutilized by the medical fraternity of the present era, despite evidences of their effectiveness in both normal and clinical populations. Unfamiliarity with the available large literature on HPLP and professional bias towards formal psychotherapeutic and pharmacological interventions can be attributed to the unjustified negative expectations of the clinicians in preferring HPLP as the first line treatment modality. Presently, there is a snowballing cognizance that contemporary medical science needs to emphasize much on the lifestyle changes for primary prevention, secondary intervention and to empower the community to self-manage their own physical and mental health. Health promotion and lifestyle modification has become an integral part of modern Medical Physiology which aims at preventing the appearance of risk factors of diseases at the grass-root level, rather than allowing the occurrence of complications of diseases and instituting byzantine therapeutic measures to manage them.

HPLP are effective determinants of both physical and mental health (MH). It is well known that cardiovascular diseases, obesity, cancer and diabetes are strongly influenced by lifestyle. In addition, unhealthy

lifestyle practices including smoking, alcoholism, drugs, improper diet and sleep habits exert a major impact on longevity and mortality.^[1] HPLP offer several secondary advantages to patients like improvement in physical health, self-esteem and better living standards.^[2] Evidences supporting the neuroprotective roles of exercise, diet and meditation by plummeting the risk of age-related cognitive losses and corresponding neural shrinkage are also available currently^[3-5] In experimental works elsewhere, physical activity increased neurogenesis in rat hippocampus, on condition that the animals were exposed to 4 rich social environment rather than kept in isolation^[6] Likewise, exercise, vegetarian diet, relaxation, social support and stress management showed beneficial and synergistic effects in reversing coronary arteriosclerosis^[7] The beneficial roles of HPLP in preventing and treating somatic ailments have been well established but can the same be true for psychological disorders? Possibly yes, yet we don't have a clear cut answer.

The present novel study was designed to find out the relationship between HPLP and MH status among Indian undergraduate students in a stressful social circumstance. The salient feature of this study was that it was conducted during the COVID-19 lockdown period in India. The nationwide lockdown due to the pandemic was enforced in the country from March 2020 to August 2020. During this lockdown period, educational institutions, entertainment centers, markets, shopping complexes, theme parks and transport facilities were completely at a standstill, placing an enormous stress on the population. Students were also exposed to a new deskbound lifestyle of being at home for the entire day and attending online classes through various digital platforms. This facilitated the practice of sedentary and unhealthy lifestyle practices including poor diet and sleep

habits, immobility, overeating, prolonged exposure to digital appliances like mobile phones, televisions, tablets and computers. Thus, the present study was planned to evaluate the differences in the HPLP between apparently healthy male and female undergraduate students and to determine if these HPLP are correlated with the MH status of the students during the COVID-19 lockdown period.

MATERIALS AND METHODS

ETHICAL APPROVAL

The Institute Ethical Committee of the Banaras Hindu University, Varanasi, India (Ref. No. Dean/2019/EC/1755) provided approval for conducting the present study. The entire work was performed in accordance with the Helsinki Declaration, 2000. This study was a questionnaire based study and no invasive interventions were performed on the subjects. Informed consent was taken from all the participants and instructions for filling the questionnaires were clearly given to them in Hindi or English by the principal author of this study. Since the subjects needed to be assessed regarding their lifestyle and mental status, care was taken to establish a good rapport with the subject before distributing the questionnaire.

STUDY DESIGN AND PARTICIPANTS

The present study was an analytical cross-sectional study wherein 200 students who were pursuing their first year undergraduate degree programs in the faculties of arts, sciences, law, medicine and engineering in the Banaras Hindu University (main campus), Varanasi, India were recruited. Of the subjects, 100 were male and 100 were female. The subjects who were less than 18 years and more than 21 years of age were excluded from the study to maintain uniformity in the sample population. Students who are differentially abled and those suffering from any diagnosed physical and

mental diseases and addictions were also let off from this study.

CONDUCT OF THE STUDY DURING COVID-19 LOCKDOWN

The contact numbers of the students were obtained with due permission from the respective department heads and they were individually contacted by the principal investigator through mobile phone for obtaining consent, explaining the need and importance of the study, probing a brief medical history of the subjects, obtaining the email id of the students and for providing instructions to fill the questionnaire. Once the students gave their consent to participate, the consent form along with the questionnaires as mentioned below were mailed to the students. The subjects were asked to sit in a calm place as per their comfort and the principal investigator was connected online with them through Google Meet application. This enabled the investigator to supervise the student when they were filling the questionnaires and also to provide clarifications whenever necessary. After completing, the students were asked to scan the filled questionnaire and mail it back to the investigator. The authors then calculated the total scores, tabulated the data and analyzed the results.

QUESTIONNAIRES USED IN THE STUDY

The Health Promoting Lifestyle Profile II, a standard and accepted self-administered tool was used in our study to measure the behaviors associated with HPLP. [8] The scale consisted of 52 items provided with four response options and divided into 6 dimensions namely Health responsibility (HR), Physical activity (PA), Nutrition (NU), Spiritual growth (SG), Interpersonal relations (IR) and Stress management (SM).

The Mental Health Inventory was used in the present study to assess the dimensions of MH among

students.[9] The inventory was composed of 56 items including 32 false-keyed (negative) and 24 true-keyed (positive) statements. The split half method was used for determining the test reliability; the reliability coefficients of different dimensions were as follows: Positive self-evaluation (PSE-0.75), Perception of reality (POR-0.71), Integration of personality (IOP-0.72), Autonomy (AUT-0.72), Group oriented attitude (GOA-0.74), Environmental competence (ECO-0.71) and the overall reliability coefficient was 0.73. The scale was validated against both external and internal criteria. Construct validity of the inventory was determined by finding the coefficient of correlation as 0.54 between scores on MHI and Global Health Questionnaire-28. [10,11]

DATA ANALYSES

Data from the filled questionnaires were fed into MS Excel database and the mean \pm SEM were calculated. The entire data were tested for normality by Kolmogorov-Smirnov test and found to be normally distributed. The difference between male and female subjects were analyzed by Student t-test. The relationship between HPLP and MH scores was assessed with the help of Pearson product moment correlation method. All statistical tests were performed using SPSS 16.0 software. The data are presented in this article as bar diagrams prepared using Sigma Plot 10.0 software. A P value of <0.05 was considered significant.

RESULTS

Observations from the present study showed that HPLP were better prevalent among female students as compared to the male students. Female subjects outweighed the male subjects in HPLP dimensions like HR, PA, NU and SM while there were no significant differences in SG and IR domains [Figure 1]. The MH status of the female participants were also better as compared to the male counterparts. Female subjects

scored better in MH dimensions like PSE, IOP, GOA and ECO while there were no significant gender differences in rest of the MH dimensions [Figure 2]. Both in male and female students, the HPLP were positively correlated with MH status and vice versa [Figure 3].

HEALTH PROMOTING LIFESTYLE PRACTICES AMONG MALE AND FEMALE STUDENTS

The 52 items of the HPLP II scale were categorized into standard 6 dimensions. The mean \pm SD scores of the male and female students respectively in individual HPLP dimensions were HR: 19.65 ± 2.06 and 26.46 ± 3.76 , PA: 17.43 ± 2.39 and 23.06 ± 3.14 , NU: 18.68 ± 1.02 and 24.46 ± 1.70 , SG: 20.26 ± 2.18 and 23.21 ± 0.76 , IR: 18.86 ± 1.63 and 21.68 ± 1.12 , SM: 17.54 ± 1.71 and 21.54 ± 1.80 . The total HPLP scores of male and female subjects were 113.45 ± 2.31 and 137.35 ± 3.12 respectively. The HR, PA, NU and SM scores of female students were significantly higher as compared to the male students [Figure 1, $P < 0.05$, Unpaired t-test] while the scores of SG and IR dimensions were not significantly different between the genders [Figure 1, $P > 0.05$, Unpaired t-test]. The overall HPLP II score of the female students were significantly higher than that of the males [Figure 3, $P < 0.05$, Unpaired t-test]

MENTAL HEALTH STATUS AMONG MALE AND FEMALE STUDENTS

The 56 items of the MH Inventory were categorized into standard 6 dimensions. The mean \pm SD scores of the male and female students respectively in individual MH dimensions were PSE: 23.12 ± 2.01 and 26.44 ± 2.50 , POR: 20.46 ± 2.10 and 23.86 ± 2.51 , IOP: 22.24 ± 0.56 and 30.22 ± 2.51 , AUT: 17.56 ± 3.42 and 19.04 ± 3.04 , GOA: 20.38 ± 3.11 and 26.28 ± 2.25 , ECO: 24.67 ± 2.32 and 29.25 ± 2.60 . The total MH inventory scores of male and female subjects were 127.52 ± 3.06 and 154.64 ± 2.98 respectively. The PSE, IOP, GOA and

ECO scores of female students were significantly higher as compared to the male students [Figure 2, $P < 0.05$, Unpaired t-test] while the scores of POR and AUT dimensions were not significantly different between the genders [Figure 2, $P > 0.05$, Unpaired t-test]. The overall MH inventory score of the female students were significantly higher than that of the males [Figure 3, $P < 0.05$, Unpaired t-test].

HPLP and MH status are positively correlated for both genders

The relationship between HPLP and MH scores was assessed with the help of Pearson product moment correlation method. The coefficients of correlation between the total scores of HPLP II and MH inventory for males and females were 0.42 and 0.48 respectively which were statistically significant at $P < 0.01$ level [Figure 3, Pearson correlation].

DISCUSSION

The present study is a cross-sectional study that assesses the HPLP and MH status among apparently healthy undergraduate university students. Results from this work show that HPLP and better MH status are habitual among the female students as compared to the males. Female subjects have scored more than the male subjects in HPLP dimensions like HR, PA, 9 NU and SM and in MH dimensions like PSE, IOP, GOA and ECO. Both in male and female students, the HPLP were positively correlated with MH status and vice versa. HPLP are known to offer significant physical benefits that encompass multiple body systems^[1,12] HPLP can be defined as listing, obligating and following through tasks that are behaviors performed to care for oneself. HPLP are regarded by the 'Harvard Mental Health Letter' as a healthful, inexpensive and insufficiently used treatment for a variety of psychosomatic disorders. HPLP offer preventive benefits by reducing the risk of depression as

well as neuro-degenerations like age-related cognitive decline such as Alzheimer's and Parkinson's disease and therapeutic benefits in anxiety, depression, eating, addictive and body dysmorphic disorder.^[2,3,13] Proposed physiological mediators for these constructive roles include changes in serotonin metabolism, improved sleep and endorphin release. Psychologically, enhanced self-efficacy and self-esteem, interruption of negative thoughts and rumination, the breakdown of muscular armor, the chronic psychosomatic muscle tension patterns that express emotional conflicts are known to play a key role^[14,15]

Talking about the neural mechanisms, HPLP are known to increase the volume of both gray and white matter of brain, promote vascularization and blood flow thereby improving cortical functioning.^[3,16] Animal studies have shown exercise-induced neurogenesis, synaptogenesis, neural preservation and inter-neuron connection in the hippocampal regions.^[17] Given these neural effects, HPLP can thus confer significant cognitive benefits ranging from enhancing academic performance, aiding recovery in stroke patients, reducing memory loss and risk of dementia in the elderly.^[3,18] Cognitive benefits can be enhanced by more strenuous activity and by combining strength training with aerobics.^[19,20] Though women are known to gain more MH benefits than men through HPLP, everyone seems to be benefitted, including both clinical and nonclinical populations.^[19]

In addition there are now considerable evidences portraying the importance of nutrition for mental health. Multiple human and animal studies suggest that pescetarian diets ameliorate psychopathologies across life span by enhancing academic performance in children as well as reducing shizo-affective disorders in adults.^[21,22] Some neuro-protective dietary elements

include fish, vegetables, fruits and lower intake of animal fats.^[23-25] Of the colossal public health significance are contemporary findings suggesting that, due to epigenetic factors the effects of diet on mental health can be transmitted across generations.^[21] Growing evidence also suggests that food supplements including vitamin D, folic acid and fish oil offer appreciated prophylactic and therapeutic benefits for mental health.^[26]

The idea that good relationships are central to both physical and mental well-being is an ancient theme, now supported by considerable research. Rich relationships decrease health risks ranging from common cold to stroke. Positively, better relationships are associated with enhanced happiness, quality of life, resilience and cognitive capacity. These clinical observations are further supported by the unindustrialized field of social neuroscience which suggests that we are inter-reliant mortals hardwired for empathy and relationship.^[27] Through understandings of positive emotions people transmute themselves becoming more creative, knowledgeable, resilient, socially integrated and healthy individuals.^[28]

Chronic stressors cause major tolls on various organ systems encompassing psychological, chemical to genomic expressions.^[29] Humans at the present time face numerous unusual stressors for which there are no evolutionary or historical precedents. Many skillful strategies for stress management are available, ranging from lifestyle changes to psychotherapy. Useful HPLP in this dimension includes exercise, recreation, relationships, religious or spiritual involvement and certain self-management skills including self-hypnosis and guided imagery.^[30] Contemporary skills like yoga and meditation are also notable HPLP improving the SM dimension that is practiced by millions of people worldwide.

In the present study we tried to find out the pervasiveness of HPLP among undergraduate students from a premier Indian university during the stressful COVID-19 pandemic lockdown. We can observe from the results clearly that the HPLP are followed more commonly by the girls as compared to boys. As expected there is a significant correlation between HPLP and MH status both in boys and girls. The results from the present work are consistent with similar studies involving factory workers and other subjects conducted elsewhere.^[31,32] The principal novelty of the present work is that the data were collected during the lockdown period where students were exposed to a new stressful milieu away from their routine academic environments.

CONCLUSION

Observations from the present work concludes that health promoting lifestyle practices (HPLP) and better mental health (MH) status are better prevalent among the female students as compared to the males. Female subjects have scored more than the male subjects in HPLP dimensions like health responsibility, physical activity, nutrition and stress management and in MH dimensions like positive self-evaluation, integration of personality, group oriented attitude and environmental competence. Both in male and female students, the HPLP were positively correlated with MH status and vice versa. Thus, the present work offers appreciable insights regarding the advantageous effects of HPLP towards improving MH status in a potentially stressful social environment thereby opening doors to numerous physiological and psychological therapeutic options for disorders of physical and mental dimensions of human systems in contrast with the contemporary psychotherapeutic and pharmacological approaches.

AUTHORS' CONTRIBUTIONS

The study was designed and conceptualized by RR. Data was collected and analyzed by AG. Manuscript was checked and drafted by RR.

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FIGURE LEGENDS

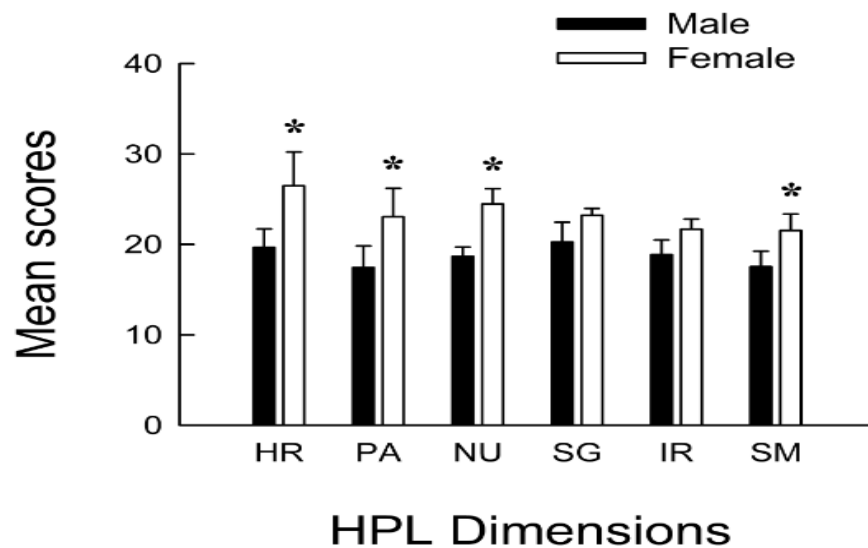


Figure 1: Bar diagrams showing the mean \pm SEM values of the scores obtained by male and female students in the Health Promoting Lifestyle Practices (HPLP) questionnaire. Each column represents the HPLP dimensions namely Health

responsibility (HR), Physical activity (PA), Nutrition (NU), Spiritual growth (SG), Interpersonal relations (IR) and Stress management (SM). An asterisk (*) indicates significant difference between the male and female subjects ($P < 0.05$, Unpaired t-test)

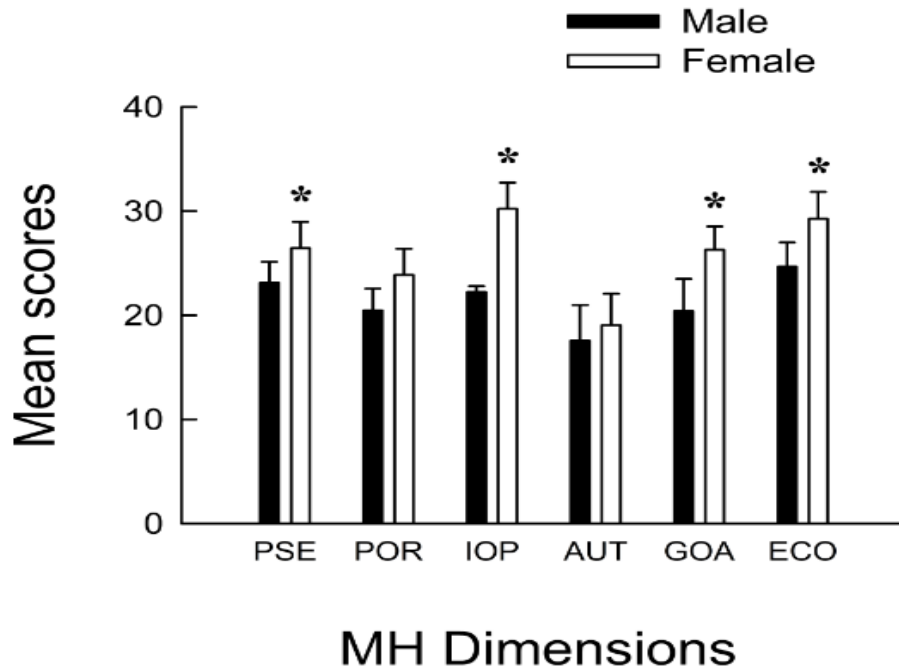


Figure 2: Bar diagrams showing the mean \pm SEM values of the scores obtained by male and female students in the Mental Health (MH) Inventory questionnaire. Each column represents the MH dimensions namely Positive self-evaluation (PSE), Perception of reality (POR), Integration of personality (IOP), Autonomy (AUT), Group oriented attitude (GOA), Environmental competence (ECO). An asterisk (*) indicates significant difference between the male and female subjects ($P < 0.05$, Unpaired t-test)

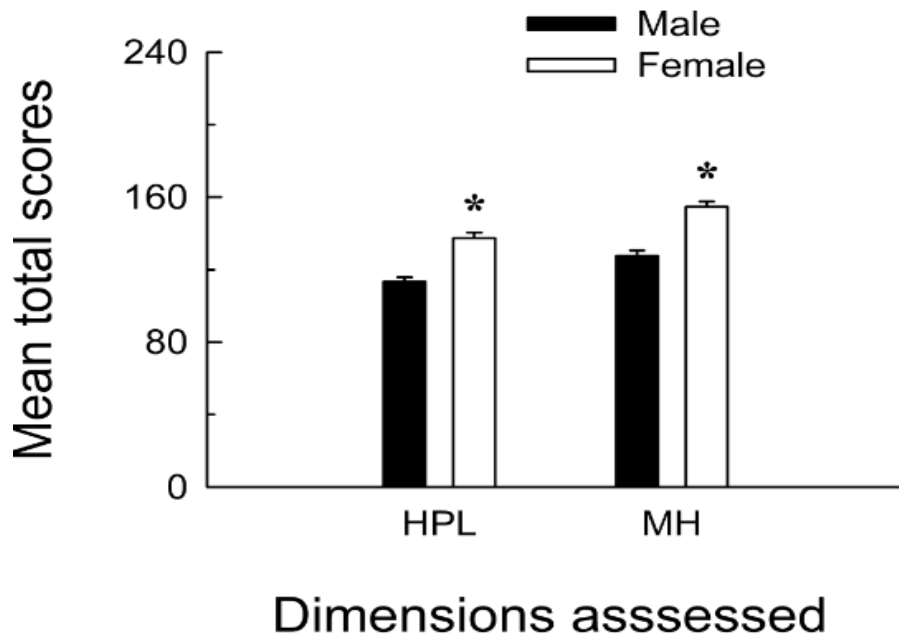


Figure 3: Bar diagrams showing the mean \pm SEM values of the total scores obtained by male and female students in the Health Promoting Lifestyle Practices (HPLP) and Mental Health (MH) Inventory questionnaires. An asterisk (*) indicates positive correlation between HPL and MH dimensions ($P < 0.01$ level, Pearson correlation)