

## Lifestyle Medicine Assessment Among The General Population Of District Sialkot, Pakistan: A Comparative Study

Rabiah Mahwish<sup>1</sup>, Fariha Liaquat<sup>2</sup>, Imrana Aslam<sup>3</sup>, Tariq Iqbal<sup>4</sup>

### Abstract

**Objective:** To assess the lifestyle medicine among the general population of the district of Sialkot, Pakistan.

**Methods:** A comparative cross-sectional study was conducted in 4 Tehsils of District Sialkot, from April to September 2024. A calculated sample of 400 healthy individuals was selected by a non-probability consecutive sampling technique, and data were collected through a modified version of the lifestyle assessment short form questionnaire

**Results:** The average age of participants was  $33.58 \pm 13.06$  years, with a predominant representation of males (60%). The majority of the respondents were young (93.5%) and graduates or post-graduates (55.4%). The mean lifestyle medicine score was 38.44.41. Only 40% of the participants had a favourable lifestyle medicine score above the mean. Education of the participants showed a significant association with lifestyle medicine score ( $p=0.027$ ), while age, area of residence and social class revealed a non-significant association.

#### Contributions:

RM, FL, IA, TI - Conception, Design  
RM, FL, IA, TI - Acquisition, Analysis, Interpretation  
RM, FL, IA, TI - Drafting  
RM, FL, IA, TI - Critical Review

All authors approved the final version to be published & agreed to be accountable for all aspects of the work.

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None to report

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### Introduction

The rise in chronic, non-communicable diseases globally, especially in Pakistan, has spurred an urgent need for medical approaches that go beyond traditional treatments, emphasising preventive and lifestyle-based interventions. Lifestyle medicine is the evidence-based practice of assisting individuals and families to adopt and sustain behaviours that can improve health and quality of life.<sup>1</sup>

Six pillars of lifestyle medicine, i.e. plant-based nutrition, physical activity, stress management, avoidance of risky substances, restorative sleep, and social connections, might delay or prevent the development of cognitive impairment.<sup>2</sup> "Lifestyle medicine involves the merging of lifestyle practices into the modern practice of medicine to decrease the risk factors for chronic disease and/or, if the disease is already there, serve as an adjuvant in its treatment.

According to the World Health Organisation (WHO), non-communicable diseases account for 41 million deaths annually, equivalent to 74% of all deaths globally. Cardiovascular diseases being the leading cause, (account for 17.7 million deaths per year), followed by cancers (9.3 million), chronic respiratory diseases (4.1 million) and diabetes (2 million including kidney disease deaths caused by diabetes), these four groups of diseases account for over 80% of all premature non-communicable disease deaths.<sup>3</sup>

A 6-months lifestyle change intervention in obese, sedentary, postmenopausal women showed that women significantly increased their physical activity (+39.6%) cardio-respiratory fitness (+13.5%) and reduced their body weight (-6.5%), fat mass (-7.4%), body fat (-2.4%) BP (SBP - 6.2%, DBP - 9.2%), total cholesterol (-7.4%), triglycerides (-16.5%), and low-density lipoprotein (LDL) cholesterol (9.1%) and improved their diet ( $p < 0.05$ ). A 3-year prospective study showed that adopting a Mediterranean diet reduced the likelihood of overweight people becoming obese.<sup>4</sup>

According to a WHO survey of Pakistan, 57% of all deaths in the country occur due to non-communicable diseases.<sup>5</sup> Among these, hypertension is at the top of the list (40%), followed by ischemic heart disease (17%) and diabetes (15%). The prevalence of modifiable risk factors responsible for these diseases is obesity (67%), pre-hypertension (37%), tobacco use (14%) and alcohol use (2%).<sup>6</sup>

To the best of our knowledge, there is limited data available in Pakistan on the awareness and practices of lifestyle medicine among the general population. Therefore, the present study was planned to assess lifestyle medicine among the general population of District Sialkot.

## Materials And Methods

This comparative Cross-Sectional study was carried out in 4 Tehsils of district Sialkot, i.e. Daska, Sialkot, Pasrur and Samrial from April – September 2024. The sample size was calculated using Cochran's formula with an anticipated population proportion  $p = 0.50$  (for maximum variability), a confidence level of 95% ( $Z = 1.96$ ), and a margin of error  $d = 5\%$ , resulting in a required sample size of approximately 384, which was rounded off to 400 taking into account for possible non-responses.<sup>7</sup> After taking approval from the institutional ethical review committee (letter no 05/REC/KMSMC dated 15/5/2024), adults aged 18-64 of both genders were recruited in the study through a non-probability consecutive sampling technique. Those adults having co-morbidities (diabetes, hypertensive disorders, ischemic heart diseases) and congenital anomalies were excluded.

A modified version of the open-access lifestyle assessment short form questionnaire, developed by the American College of Lifestyle Medicine, was used for data collection.<sup>8</sup> It is a closed-ended, standardised questionnaire consisting of 2 parts. 1<sup>st</sup> part had demographic characteristics of the participants (age, gender, marital status, education status, height, weight, employment status, occupation, monthly income and per Capita income). The socioeconomic status of the participants was calculated using the Kuppuswamy socioeconomic scale 2023.<sup>9</sup> The 2<sup>nd</sup> part consisted of a total of 14 questions related to 6 domains of lifestyle medicine (sleep, nutrition, weight management, exercise, mental health, smoking/substance abuse). The questions of the 6 domains were scored according to recommended international guidelines.<sup>10-13</sup> The healthiest practice was given the maximum score, while the unhealthiest practice was given the minimum score. The scores of each domain are given in Table 1. The total score of the lifestyle assessment questionnaire ranged from 8-59. Participants scoring above the mean were interpreted as having relatively healthier lifestyle practices, while those scoring below the mean were considered to have less favourable or suboptimal lifestyle behaviours. This approach is consistent with the use of central tendency measures in quantitative health assessments, where the mean serves as a benchmark to compare individual or group performance.<sup>14</sup>

**Table 1: Score of domains of lifestyle medicine assessment**

S. No.	Domain of lifestyle medicine	No. of items	Maximum score
1-	Sleep	2	6
2-	Weight management	1	3
3-	Nutrition	2	6
4-	Exercise	2	6
5-	Mental health	6	18
6-	Smoking and substance abuse	4	20

The researcher himself collected the data after obtaining informed consent on the lifestyle assessment short proforma. The confidentiality of the study participants was strictly maintained.

Data was entered and analysed by using SPSS version 26. Categorical variables like gender were dealt with in percentages and frequencies, while numerical variables like age, lifestyle medicine score were presented with mean and standard deviation. Chi-square test was applied to see the association between lifestyle medicine and sociodemographic characteristics like age, gender, educational status and social class. P-value  $\leq 0.05$  was considered significant.

## Results

400 participants were included in this study. The average age of participants was  $33.58 \pm 13.06$  years, with a predominant representation of males (60%). More than half were married (60%), unemployed (55%) and had a healthy weight (56%). The majority of the participants had normal self-reported glucose (82.5%), serum cholesterol (77%) and blood pressure (79%) levels. Regarding socioeconomic status Upper Middle Class was the largest group. (Table 2).

The mean lifestyle score was  $38 \pm 4.41$ . Only 40% of the participants had a life lifestyle score above the mean. For five out of six lifestyle domains, including sleep, physical activity, nutrition, weight management, and stress, a score below the mean indicated poorer adherence to recommended lifestyle practices, suggesting a need for targeted health interventions in these areas. Conversely, for the smoking and substance abuse domain, a higher score reflects lower engagement in harmful behaviours, which is desirable. Therefore, in this specific domain, scoring above the mean indicates favourable behaviour (i.e., less smoking or substance use).

Education of the participants showed a highly significant association with lifestyle score ( $p=0.027$ ), while age, area of residence and social class did not show any significant association.

Our study showed that for five out of six lifestyle medicine domains, the majority of the participants had unfavourable scores below the mean, except for the smoking and substance abuse domain, where the majority of the participants had favourable scores above the mean.

**Table 2: sociodemographic profile of the participants**

Variables	Frequency	Percentage (%)
<b>Age</b>		
<b>Youth</b>	374	93.5%
<b>Old</b>	26	6.5%
<b>Education</b>		
<b>Illiterate</b>	46	11.3%
<b>High school</b>	133	33.3%
<b>Graduate and Post Graduate</b>	221	55.4%
<b>Social class:</b>		
<b>Upper middle</b>	220	55.0%
<b>Lower middle</b>	111	27.8 %
<b>Upper lower</b>	39	9.8 %
<b>Lower</b>	30	7.5 %
<b>Residence of the person:</b>		
<b>Urban</b>	217	54.3 %
<b>Rural</b>	183	45.8 %

**Table 3: Score of domains of lifestyle medicine**

Lifestyle Medicine Domain	Mean Score	Participants with Score $\leq$ Mean	Participants with Score $>$ Mean
<b>Sleep</b>	4 $\pm$ 1.5	247(65%)	188(35%)
<b>Weight Management</b>	2 $\pm$ 0.7	205(53%)	140(47.0%)
<b>Exercise</b>	2 $\pm$ 1.8	253(63.2%)	188(36.8%)
<b>Purpose and connection/Mental Health</b>	7 $\pm$ 3.6	211(52.8%)	189(47.3%)
<b>Smoking/substance abuse</b>	19 $\pm$ 1.3	75(18.8%)	325(81.3%)
<b>Nutrition</b>	3 $\pm$ 1.1	307(82.5%)	70 (17.5%)

**Table 4: Association of lifestyle medicine and sociodemographic characteristics**

Sociodemographic Characteristics	Lifestyle Score $\leq$ Mean (8-38)	Lifestyle Score $>$ Mean (39-59)	P-value
<b>Age</b>			
<b>Youth</b>	212(60.7%)	137(39.3%)	0.207
<b>Old</b>	108(59.0%)	13(52%)	
<b>Education</b>			
<b>Illiterate</b>	22(51.1%)	23(48.9%)	
<b>High school</b>	41(30.8%)	92(69.2%)	0.027*
<b>Graduate and Post Graduate</b>	96(30.8%)	125(56.6%)	
<b>Residence</b>			0.643
<b>Rural</b>	133(61.3%)	84(38.7%)	
<b>Urban</b>	108(59.0%)	75(41.0%)	
<b>Social Classes</b>			
<b>Middle</b>	93(62.0%)	57(38.0%)	0.516
<b>Lower</b>	145(58.7%)	102(41.3%)	

## Discussion

These findings are in line with a study conducted by Mititelu et. al,<sup>15</sup> which demonstrated an increased tendency of youth towards sedentary lifestyle, little or no physical activity and an increased tendency towards high-calorie ultra-processed foods, like potato chips, burgers and chocolates. Magdalena also highlighted that the youth are much more eager to take non-alcoholic sugary beverages like coffee and soft drinks. According to Mititelu, 76.4% of the participants consumed one glass of alcohol 2-3 times per week, which is in contradiction to our study. This difference may be due to underreporting of smoking and substance abuse by our study participants, owing to the stigma attached to it, taking into account the religious and sociocultural context.

According to our study majority of the participants had unfavourable sleep scores below the mean score for the sleep domain. These findings are consistent with a study conducted by Joseph Dzierzewski,<sup>16</sup> which evidenced that most of the youth and middle-aged persons have poor sleep health. Dzierzewski further elaborated that the use of mass and social media negatively influences the sleep health of adults. Similar findings were reported in a study from India, where inadequate sleep patterns were prevalent in the general population and associated with urban stressors and screen use.<sup>17</sup> Moreover, an international systematic review supported that short sleep duration is linked to a range of adverse health outcomes in various age groups.<sup>18</sup>

Our study showed that 63.2% of the participants had unfavourable exercise scores below the mean, which is consistent with a study conducted in India,<sup>19</sup> which revealed that half of the population had a sedentary lifestyle and were obese.

Over the past few decades, a lack of physical activity has emerged as a global pandemic with a worldwide prevalence of above 31%.<sup>20</sup> Our study showed that above two-thirds of the participants (63%) had unfavourable exercise scores below the mean, while a community-wide study conducted by Ramamoorthy and his colleagues,<sup>21</sup> on seventy thousand adults showed that above 40% of adults are physically inactive. This difference may be due to the large difference in the sample size of the two studies.

Regarding the nutrition domain of lifestyle medicine, 82% of our study participants had unfavourable scores, which means most of them are involved in eating fast, packaged or sugary foods or drinks, and they consume very low whole fruits or raw vegetables. These findings are in line with a study conducted by Lee,<sup>22</sup> on American adults. According to which only 8.4-16% of American adults meet the fruit and vegetable consumption recommendations. The high consumption of high-calorie ultra-processed food and low consumption of fruits and raw vegetables is further verified by a study conducted by Syed among university students in Saudi Arabia, which concluded that only 12% of the university students consumed fruits and vegetables daily. Syed further elaborated that the majority of students consumed sugary drinks, junk food and snacks daily.<sup>23</sup> These findings are in line with our study, which showed that only 17% of the participants were involved in healthy eating.

Regarding the purpose, connection and Mental health domain of lifestyle medicine, 52% of the participants had an unfavourable score. These findings are fairly consistent with a meta-analysis conducted by Khan,<sup>24</sup> and colleagues, which showed that about 43% of the university students in Pakistan are suffering from mental health disorders. The slight difference may be due to a difference in study population and study design.

A major limitation of our study is that it is a single-centred study. We recruited participants through a non-probability sampling technique, which is not considered a representative sample. Multi-centred studies with large representative samples are recommended.

## Conclusions

Our study findings suggest that most of the study participants had an unfavourable lifestyle. Similarly, for individual lifestyle medicine domains, the score was unfavourable, i.e. below the mean, except for the smoking and substance abuse domain. Based on these findings, we strongly recommend the implementation of rigorous health education programs for the general public aiming at adequate sleep, plant-based raw nutritious food, maintenance of a healthy weight through adequate physical activity, avoidance of smoking and substance abuse and purposeful and socially well-connected life.

## Author Information

1,4. Associate Professor, KMSMC 2. Assistant Professor, KMSMC 3. Demonstrator, KMSMC.

**Corresponding author:** Dr. Rabiah Mahwish  dr.rabiah5@gmail.com

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