Original Article

Assessment of Lifestyle Behaviour and its Association in Different Professions of Twin Cities Using Short Multidimensional Inventory Lifestyle Evaluation - Confinement (SMILE-C) Questionnaire; A Cross-sectional Survey

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Abstract

Background: The Short Multidimensional Inventory Lifestyle Evaluation-Confinement (SMILE-C) scale, a 27-item modification of the original 43-item SMILE questionnaire, was developed to assess lifestyle over the past 30 days. It has been widely used in the West during COVID-19 but remains unutilized in Pakistan's general population. This study aimed to evaluate lifestyle behavior across different professions using SMILE-C.

Objective: To analyze lifestyle behavior among individuals in different professions in Pakistan.

Materials and methods: A survey was conducted among 400 individuals from five professions (doctor, teacher, IT specialist, banker, laborer). The questionnaire included demographic details and lifestyle assessments through the SMILE-C tool. Participants voluntarily filled the consent form and self-reported changes in seven lifestyle domains. Data analysis was performed using IBM® SPSS® 27, with independent sample t-tests and ANOVA for significance testing.

Results: The total sample size was 400 (80 per profession). The mean SMILE-C score was 82.24. Profession-wise means were: 81.82 ± 8.02 (doctor), 86.70 ± 8.53 (teacher), 81.06 ± 8.11 (IT specialist), 78.79 ± 11.57 (banker), 82.77 ± 12.47 (laborer). Teachers had the highest score, indicating a better lifestyle. Differences in the seven lifestyle domains among professions were statistically significant ($p<0.001$), with significant pairwise comparisons.

Conclusion: Occupation significantly influences lifestyle behavior. The findings highlight the need for targeted lifestyle interventions to promote community health.

Keywords: Lifestyle, inventory, evaluation

Introduction

Lifestyle is considered a multidimensional setup which includes nutrition, substance use, physical activity, stress management, social support, restorative sleep, and screen time.[1] Evidence suggests that a person's health-related behaviors influence body esteem.[2] Evidence shows that multiple aspects of our lifestyles correspond to our mental health.[3] A healthy lifestyle is a determinant of health, increasing well-being, and decreasing chronic disease incidence. Conversely, unhealthy lifestyles have been shown to worsen physical and mental health, contributing to the global burden of diseases.[4] Increased morbidity and mortality due to chronic diseases are linked to several health behaviors.[5] A healthy lifestyle confers changing unhealthy habits and adopting healthy lifestyles, as studies by WHO showed that 60 percent of quality of life and 53 percent of causes of mortality are linked to lifestyle behaviors.[6]

The key instrument to measure changes in lifestyle behaviors is the Short Multidimensional Inventory Lifestyle Evaluation-Confinement (SMILE-C), developed during the period of COVID-19.[7] This tool was developed from the original SMILE, which is a self-assessed 43-item questionnaire comprising seven lifestyle domains: diet/nutrition, substance abuse, physical activity, stress management, restorative sleep, social support, and environmental exposure. The SMILE-C scale analyses in a global way the lifestyle during the last 30 days, with a questionnaire of 27 items belonging to the seven domains mentioned.

Lifestyle behaviors play a crucial role in overall well-being, influencing both physical and mental health. The COVID-19 pandemic significantly impacted these behaviors, leading to shifts in daily routines, physical activity, and mental health outcomes.

Studies conducted in various countries have highlighted an increase in anxiety and depression during this period. In Canada, research found a notable rise in mental health concerns among the population.[8] Similarly, studies in Spain examined lifestyle changes among undergraduate students, revealing disruptions in daily habits.[9] In Brazil, anxiety and depression were identified as the most prevalent psychiatric symptoms during the pandemic.[10]

While extensive research has been conducted globally, there remains a gap in understanding these lifestyle changes in Pakistan. Addressing this gap is essential for developing targeted health interventions and improving public health strategies. This study aims to contribute to the existing body of knowledge by exploring lifestyle behaviors and their implications in the local context.

This research was conducted to assess the lifestyle behaviour in Pakistani population belonging to different professions i.e. teachers, doctors, laborers, bankers and IT professionals, using SMILE-C. Furthermore, assessment of lifestyle behaviour is essential to improve both physical and mental health in a community, and this will also enable us to reduce the incidence of non-communicable diseases in the long run, as they are directly related to poor lifestyle habits.

Rationale of this research was to assess the lifestyle behaviour in Pakistani population belonging to different professions using SMILE-C because this tool was only utilized during the COVID-19 pandemic by the western world. This research aims to address this literature gap. Furthermore, assessment of lifestyle behaviour is essential to improve both physical and mental health in a community, and this will also enable us to reduce the incidence of non-communicable diseases in the long run, as they are directly related to poor lifestyle habits.

The objectives of this research are to determine the lifestyle behavior of the Pakistani population using SMILE-C scale and to identify demographics factors associated with lifestyle behavior using SMILE-C score.

Materials and Methods

A cross-sectional study was conducted from 24th February, 2023 to 24th July 2023 by medical students among Pakistani population living in Rawalpindi and Islamabad A sample size of 400 individuals was taken and was calculated using a 95% confidence interval with prevalences 18.4%(depression), 21.5%(anxiety) and 24.8%(stress).[12] The sampling technique was non-probability convenience sampling. Males and females of following professions i.e. teachers, doctors, labourers, bankers and IT professionals volunteering to participate in research were included in the study. We included 80 individuals from each profession. Nutritionists, dieticians, fitness, athletic trainers, and individuals suffering from a chronic debilitating disease, hospitalized patients, or those having any orthopedic, musculoskeletal or physical disability were excluded from this study.

Lifestyle: Everyday activities of individuals in relation to their diet and nutrition, substance use, physical activity, stress management, restorative sleep, social support, and environmental exposures. For each domain, individuals are categorized as "Unhealthy" or "Healthy" based on their SMILE-C score in that domain: Diet and Nutrition (Unhealthy: 5 to 12, Healthy: 13 to 20), Substance use (Unhealthy: 4 to 10, Healthy: 11 to 16), Physical activity (Unhealthy: 1 to 2, Healthy: 3 to 4), Stress management (Unhealthy: 6 to 15, Healthy: 16 to 24), Restorative sleep (Unhealthy: 4 to 10, Healthy: 11 to 16), Social support (Unhealthy: 6 to 15, Healthy: 16 to 24), Environment exposure (Unhealthy: 1 to 2, Healthy: 3 to 4).

Questionnaire: A multidimensional scale comprising 27 items grouped in 7 lifestyle domains: diet and nutrition, substance use, physical activity, stress management, restorative sleep, social support, and environmental exposures, responses of which are measured on a 4-point Likert scale (score ranging from 27 to 108).11

Lifestyle behavior among different professions was assessed using Short Multidimensional Inventory Lifestyle Evaluation- Confinement (SMILE-C) Questionnaire and the primary outcome was the SMILE-C score. This tool allows a multidimensional and comprehensive analysis of lifestyle over the past 30 days. It comprises of 27 items grouped in 7 lifestyle domains. The responses are measured on a 4-point Likert scale (always, often, seldom, never) and the final score is obtained as a sum of all the scores in the questionnaire (some questions have reverse scores). The final score ranges from 27 to 108. The higher the score, the healthier the lifestyle.11

Demographic information included: age, gender (male/female), occupation (doctor/teacher/IT specialist/banker/laborer), income (less than 50,000 Rs./between 50,000 to 100,000 Rs./between 100,000 to 150,000 Rs. /more than 150,000 Rs.) and ethnicity (Punjabi/Sindhi/Balochi/Pashtun/Kashmiri/other) .

Statistical analysis was conducted using IBM® SPSS® 27. Mean SMILE-C score was calculated for all lifestyle domains among 5 occupations separately. Independent sample t test was used to evaluate statistically significant association of SMILE-C score with gender (dichotomous variable) and ANOVA was used for variables

presenting more than two response categories i.e. age groups, occupation, income and ethnicity. A p-value of <0.05 was used to indicate statistical significance among the variables being tested. Participants were assured that their information will be kept confidential and data obtained will be kept anonymous, personal identifiers will be removed and anonymous data will be used only for publication purpose and it will not be shared publicly in any case.

Results

A total of 400 individuals took part in the survey. Out of these, 243 (60.8%) were males and 157 (39.3%) were females. Age was divided into 3 groups: Group 1 (25 years and below), Group 2 (26-35 years) and Group 3 (36 years and above). The minimum age recorded in the data was 16 years and the maximum age was 65 years. Data was collected from individuals belonging to 5 different occupations, with 80 people in each category: Doctors (20%), Teachers (20%), IT specialists (20%), Bankers (20%) and Laborers (20%). The income and ethnicity were also recorded. Table-I shows all the demographic variables included in the survey along with their respective mean SMILE-C scores and association. Among the occupations, the highest SMILE-C score was found in Teachers (Mean=86.70 ± 8.53), indicating a healthier lifestyle whereas the lowest SMILE-C score was found in Bankers (Mean= 78.79 ± 11.57), indicating an unhealthier lifestyle. We found a significant relationship of SMILE-C score with gender (p= 0.022), occupation (p< 0.001) and ethnicity (p= 0.020). However, no significant association of SMILE-C score was reported among age groups (p=0.262) and income (p= 0.513).

Table-I Frequencies of demographic variables involved in the study and their mean SMILE-C scores

Parameters	**n (%)**	**SMILE-C score Mean± SD**	**p-value**
Gender			0.022
Male	243 (60.8%)	81.35 ± 11.07	
Female	157 (39.3%)	83.66 ± 8.53	
Age Groups			0.262
Group 1 (25 years and below)	159 (39.8%)	81.82 ± 8.84	
Group 2 (26-35 years)	149 (37.3%)	81.80 ± 10.71	
Group 3 (36 years and above)	88 (22.0%)	83.85 ± 11.51	

Occupation			<0.001
Doctor	80 (20.0%)	81.82 ± 8.02	
Teacher	80 (20.0%)	86.70 ± 8.53	
IT specialist	80 (20.0%)	81.06 ± 8.11	
Banker	80 (20.0%)	78.79 ± 11.57	
Laborer	80 (20.0%)	82.77 ± 12.47	
Income			0.513
Less than 50k	168 (42.0%)	82.44 ± 11.32	
Between 50k to 100k	141 (35.3%)	82.91 ± 8.84	
Between 100k to 150k	59 (14.8%)	81.36 ± 9.22	
More than 150k	31 (7.8%)	80.19 ± 11.43	
Ethnicity			0.020
Punjabi	312 (78.0%)	81.88 ± 9.96	
Sindhi	2 (0.5%)	72.5 ± 12.02	
Balochi	5 (1.3%)	84.80 ± 8.47	
Pashtun	45 (11.3%)	86.86 ± 11.78	
Kashmiri	23 (5.8%)	80.39 ± 7.20	
Other	11 (2.8%)	79.18 ± 12.11	

SMILE-C: Short Multidimensional Inventory Lifestyle Evaluation – Confinement; SD: Standard Deviation

The mean SMILE-C score was 82.24 ± 10.20, considering the total sample. The minimum score obtained was 47 and the maximum was 104. Figure 1 demonstrates the frequency and distribution of SMILE-C score in the sample.

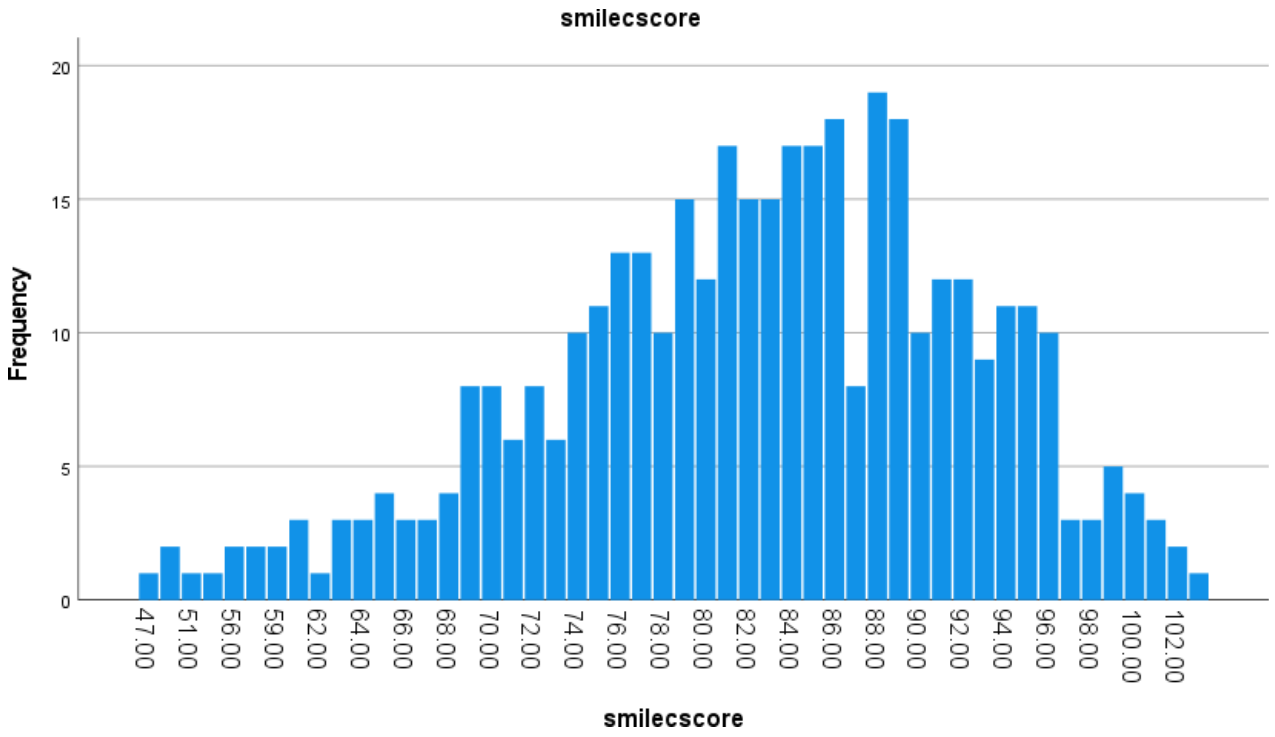

Figure 1 Frequency and distribution of SMILE-C score in the sample (n=400)

The mean SMILE-C scores were also calculated in 7 lifestyle domains: diet and nutrition, substance use, physical activity, stress management, restorative sleep, social support, and environment exposure separately for the 5 included occupations as shown in Table-II. In a particular domain, the higher the score of a particular occupation, the healthier the lifestyle of that occupation in that domain.

Table-II SMILE-C scores in 7 lifestyle domains among 5 occupations represented as Mean±SD

	Diet and nutrition	Substance use	Physical activity	Stress management	Restoration sleep	Social support	Environment exposure
Doctor	13.26 ±2.12	15.74 ±0.63	2.39 ±0.87	16.94 ± 2.80	11.59 ± 2.59	19.81 ± 3.24	2.10 ± 1.08
Teacher	14.83 ±2.13	15.71 ±0.88	2.31 ±0.89	18.57 ± 3.11	12.91 ± 2.47	20.73 ± 3.46	1.81 ± 0.98
IT specialist	13.66 ±2.20	14.50 ±1.95	2.48 ±0.90	17.54 ± 2.75	11.91 ± 2.62	19.30 ± 3.02	1.53 ± 0.76
Banker	13.43 ±2.61	15.41 ±1.21	2.50 ±0.97	15.94 ± 3.29	12.14 ± 2.80	17.68 ± 5.19	1.59 ± 0.81
Labourer	16.41 ±2.88	13.75 ±2.71	3.48 ±0.98	14.89 ± 3.17	13.03 ± 2.86	18.00 ± 4.28	3.23 ± 0.99

For each lifestyle domain, the score was grouped as "Unhealthy" or "Healthy" and the number of individuals from each profession were categorized accordingly for each domain based on their SMILE-C score in that domain. Table-III shows the results obtained. It can be seen that a majority of laborers (70) were classified as "Healthy" as compared to others in diet and nutrition whereas more laborers reported "Unhealthy" lifestyle in substance use (11). More teachers reported healthier lifestyle in stress management (67) and restorative sleep (66) as compared to the rest. In social support, nearly equal number of doctors (70), teachers (71) and IT specialists (73) reported "Healthy" lifestyle as opposed to fewer bankers (55) and laborers (57). A maximum number of IT specialists (73) were classified as "Unhealthy" in environment exposure as compared to laborers where only 16 reported as "Unhealthy".

Table-III Number of individuals belonging to 5 professions grouped in "Unhealthy" and "Healthy" categories in 7 lifestyle domains

	Health status	**Doctors**	**Teachers**	**IT specialists**	**Bankers**	**Laborers**
Diet and Nutrition	Unhealthy	31	14	24	26	10
	Healthy	49	66	56	54	70
Substance Use	Unhealthy	0	0	3	0	11
	Healthy	80	79	77	79	69
Physical activity	Unhealthy	46	50	43	38	14
	Healthy	34	30	36	42	66
Stress management	Unhealthy	25	12	21	36	41
	Healthy	55	67	59	44	39
Restoration sleep	Unhealthy	23	14	27	27	16
	Healthy	57	66	52	53	64
Social support	Unhealthy	10	9	7	25	23
	Healthy	70	71	73	55	57
Environment exposure	Unhealthy	55	60	73	68	16
	Healthy	25	20	7	12	64

Discussion

In our study, we aim on targeting the lifestyle behaviors among five occupations (doctors, teachers, bankers, IT specialists, labourers) along with finding its association with gender, income and ethnicity through SMILE-C score.

According to our study, there is statistically significant relationship between lifestyle behaviors and different genders ($p < 0.05$), lifestyle behaviors and different occupations ($p < 0.05$), lifestyle behaviors and different ethnicity groups ($p < 0.05$). This result is consistent with the findings of other study done in Korea that explain it as different occupations have different working hours, different working patterns and different amount of workload, hence different lifestyle patterns.[12] In another study, significant differences were found in smoking, alcohol misuse and physical inactivity between different genders.[22]

The findings reveal an interesting pattern in the domain of diet and nutrition, where occupations are ranked from better to worse dietary habits as follows: labourers, teachers, IT specialists, bankers, and doctors. Despite labourers having a lower socioeconomic status than doctors, they still exhibit better dietary habits. This challenges the assumption that financial distress is universally linked to poor diet quality. This observation aligns with other studies suggesting that financial hardship does not always correlate with poor dietary habits. Additionally, the differences in dietary habits across these occupational groups can be attributed to variations in working hours and job-related stress. As previous research has indicated, these factors can significantly influence eating behaviors, offering an explanation for the dietary differences observed in this study. Some studies show a positive association between working hours and BMI whereas some studies show no association between long working hours and unhealthy dietary habits.[18]

For the domain of substance use, occupations are arranged in the better to worst order in the following way: doctors, teachers, bankers, IT specialists and labourers that is in correspondence with the number of healthy individuals i.e. 80, 79, 79, 77, 69 respectively. This is consistent with a study done in Korea that has found out that substance use is prominent in blue collar workers.[12] IT specialists showing unhealthy behavior in this domain is consistent with a study that shows positive association between screen time and level of depression12, and depression in return has a positive association with increased substance use in Canadian students.[20] The difference among doctors, teachers and labourers is most likely due to the better stress management in teachers and poor stress management in laborers. This is consistent with a studies done in Korea, USA and Netherlands that prove positive association between increased levels of stress and use of addictive substances.

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better stress management in teachers and poor stress management in laborers. This is consistent with a studies done in Korea, USA and Netherlands that prove positive association between increased levels of stress and use of addictive substances.

For the domain of physical activity, occupations are arranged in the better to worst order in the following way: labourers, bankers, IT specialists, doctors and teachers that is in correspondence with the number of healthy individuals i.e. 66, 42, 36, 34, 30 respectively. This is consistent with a study done in Korea that has found out that physical activity is better in blue collar workers than in white collar workers.[12]

For the domain of stress management, occupations are arranged in the better to worst order in the following way: teachers, IT specialists, doctors, bankers and labourers that is in correspondence with the number of healthy individuals i.e. 67, 59, 55, 44, 39 respectively. This is because the nature and load of work is very different in all these professions. Sufficient studies are there to prove the negative impact of longer working hours on sleep quality and social functioning. Ultimately poor sleep impacts the hormones of the body, impacting the stress levels in the body as proved in a study done in Columbia and University of Birmingham.

For the domain of restorative sleep, occupations are arranged in the better to worst order in the following way: labourers, teachers, bankers, IT specialists and doctors. This result is consistent with the findings of other studies done in Korea and Columbia that show association of long working hours with poor sleep and depression.[12] Moreover, better physical activity positively impacts sleeping behavior of labourers as found out in a study done in China.

For the domain of social support, occupations are arranged in the better to worst order in the following way: teachers, doctors, IT specialists, labourers and bankers. To explain this, we see that stress levels have direct association with social dysfunctioning18 and we have seen this above that teachers have better stress management than all the other occupations, and hence better social support behavior than the other occupations.

For the domain of environment exposure, occupations are arranged in the better to worst order in the following way: labourers, doctors, teachers, bankers and IT specialists. This difference can be associated with many factors like socioeconomic status, nature of job or personal preferences, but no significant study has been done so far on this association.

In conclusion, our study assesses lifestyle behaviours in different occupations on the basis of seven domains of SMILE-C questionnaire. Highest nutritional habits are found in labourers and lowest in doctors. High incidence of substance use is found in labourers and lowest in doctors. High physical activity is found in labourers and lowest in the teachers. Stress management is the best in teachers and least in the labourers. High quality sleep is found in labourers and poor quality in doctors. Highest social functioning is found in teachers and lowest in bankers. Environment exposure is best in labourers and lowest in IT specialists.

Conclusion

Our study showed meaningful changes in lifestyle among different occupations in seven lifestyle domains, suggesting that occupation impacts lifestyle behavior in various ways. The findings highlight the importance of incorporating healthy lifestyle practices and the need for targeted lifestyle interventions to promote health in a community.

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