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HEALTH BEHAVIOR AND ITS INFLUENCE ON PREVENTIVE HEALTHCARE PRACTICES

Humayun Ali[1*], Jawad Ali[2]

[1]King Edward Medical College, Lahore, Punjab, Pakistan

[2]National University of Medical Sciences, Rawalpindi, Punjab, Pakistan

*Corresponding Author E-mail: dr.humayunalii@yahoo.com

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Abstract

The growing burden of preventable diseases in developing countries like Pakistan underscores the critical importance of promoting proactive health behavior. Preventive healthcare encompassing regular screenings, vaccinations, and healthy lifestyle practices relies heavily on individual behavioral choices shaped by social, cultural, economic, and psychological factors.This study investigates the influence of lifestyle behaviors, health awareness, and socio-demographic characteristics on the uptake of preventive healthcare services in Pakistan. Using a cross-sectional analytical approach, data were collected through behavioral assessment tools, regression modeling, and visual analytics to evaluate how variables such as diet, physical activity, sleep, and awareness correlate with preventive engagement.The results indicate that individuals with higher health behavior scores characterized by balanced diets, adequate sleep, and regular physical activity exhibit significantly greater participation in preventive services. Preventive engagement was also found to be positively associated with awareness levels and socioeconomic status, while smoking, misinformation, and psychological barriers such as fear and denial were negatively correlated with proactive health behaviors.The findings further reveal gender disparities, with female participants reporting higher health awareness and service utilization than males, and rural populations displaying lower engagement due to infrastructural and cultural constraints. Additionally, digital health campaigns and education-based outreach programs emerged as impactful tools in raising awareness, particularly among youth and urban populations.In conclusion, the study highlights the need for multidimensional strategies that address behavioral, structural, and informational barriers to preventive healthcare. By promoting health literacy, expanding access, and designing culturally relevant interventions, Pakistan can enhance preventive healthcare uptake, reduce disease burden, and foster a more health-conscious population aligned with sustainable public health goals.

Keywords: Health Behavior, Preventive Healthcare, Lifestyle Choices, Health Awareness

INTRODUCTION

It is demonstrated that health behavior is growing to become one of the foundations of quality preventive healthcare systems. With the world entering an era where healthcare was changing its paradigm towards preventive healthcare, the realization of whether behavior is deterministic of health acquires a paramount importance to the furtherance of the health of the population (Khan et al., 2023). Along with other countries like Pakistan where the burden of preventable diseases is increasing, individual and community health behaviors are the major determinants of the effectiveness of community uptake of prevention health services (Ahmed et al., 2021; Shah et al., 2022).Preventive care is a broad term covering various measures, such as vaccinations, frequent checkups, nutrition and routine lifestyle adjustments, and other preventive measures to counter the manifestation of disease (Ali and Shah, 2023). The uptake of these services is however not uniform. Difference in socioeconomic status, cultural beliefs, supply of healthcare infrastructure, and education background are some of the contributing factors toward the high disparities in the preventive behavior of different population groups in Pakistan (Ahmed and Hassan, 2021; Bashir and Ahsan, 2021). The available evidence indicates that such disparities are not only structural but are also deeply rooted in the behavioral decisions people make, as well as their choices related to their health (Yousaf and Ali, 2021; Rehman et al., 2022).

Personal life choices, including food intake, physical exercise, sleep hygiene, and drug consumption, play a major role in the engagement in preventive health (Rehman et al., 2022; Khan et al., 2023). The patients with proper routines (healthy food, sports, and sleep) are inclined to routine checkups and doctor visits (Farooq and Khan, 2023). On the other hand, unhealthy behavior (i.e., smoking, alcohol, or too much sedentary life) tends to lead to a low demand of preventive services (Chaudhry and Khan, 2022). The pattern of behavior indicates that there is feedback loop in which ill lifestyle habits encourage the lack of preventive care leading to even greater risks and issues in health.Health awareness is also shown as a major determinant of preventive health attendance. Properly informed people having knowledge on diseases risks, preventive measures and existing services can actively participate in proactive health behaviors (Iqbal and Ali, 2023). There is quantifiable evidence that the effects of public health campaigns, particularly on vaccination campaigns, cancer awareness, and non-communicable disease prevention, can produce changes in the attitude and behavior of the populace (Akhtar and Ali, 2023; Sadiq and Shah, 2022). The success of this type of campaign, however, depends on its relevance and the adequacy of the cultural context, and the credibility of the source of the health information (Farooq and Rehman, 2022; Shah and Malik, 2022).In addition to this, Pakistan provides a distinct sociocultural setup with old theories, gender roles and societal operations that have a significant effect on health practices. The example of preventive healthcare being sidelined in place of urgent care solutions or folk health is typical of rural communities (Ahmed and Hassan, 2021; Khatri and Hussain, 2022). There is also a significant influence of gender dynamics: women can be restricted by their social or familial circumstances to receive treatment or can be disregarded by men as an invulnerable social group (Chaudhry and Khan, 2022; Bashir and Ahsan, 2021).This is an economic landscape that is further

complicated by economics. Many of the preventive services are either subsidized or free of charge in Pakistan; however, indirect costs, including the cost of transportation, loss of wages, and costs incurred in procuring medication, render the services non-practical among low-income populations (Iqbal and Ali, 2023). It was repeatedly demonstrated in the studies that people with high-income brackets demonstrate an increased involvement in preventive healthcare practices not only due to a higher ability to pay affordability but also due to better health literacy and accesses to the privately provided healthcare institutions (Ali and Shah, 2023; Ahmed and Hassan, 2021).

Preventive healthcare engagement is also determined by the psychological factors, including fear, denial, and a feeling of invulnerability. Waiting on screening or dodging opportunities to obtain inoculation is common among people since they are afraid of the illness or do not imagine that they will be susceptible to it (Chaudhry and Khan, 2022). Such an effect, also called, in some cases, the optimism bias, causes underutilization of preventive services, even with the obvious risk factor or family history of the disease (Yousaf and Ali, 2021). Interventions in the area of public health that do not consider means of overcoming such psychological barriers can be often ineffective in producing the desired effect.Nevertheless, the situation is encouraging in the light of many case studies. As an example, screening in women, and especially in rural and peri-urban regions, has improved significantly due to Pink Ribbon breast cancer awareness program in Pakistan (Farooq and Khan, 2023). Equally, there have also been national campaigns to end polio, to which vergence was initially resisted during initial stages, but showed a strong cultural-congruency with community-based surveillance, leading to large-scale changes in health behavior (Rehman et al., 2022).In prospect of these complexities, interdisciplinary methods that involve behavioral sciences and policies of health and cultural comprehension are urgently needed to activate preventive healthcare in Pakistan. Review of the literature highlights the importance that any successful interventions to make a change should not only apply healthy messaging to a target population but should be able to dismantle economical, cultural, and psychological obstacles (Ali and Shah, 2023; Ahmed and Hassan, 2021). Furthermore, it is possible to approach strategies to reach particular groups of the population, women, youth, and rural residents, which will raise outreach and sustainability.The paper, thus, aims to discuss the connection between personal health behavior and exposure to preventative healthcare practices in Pakistan. It attempts to give an empirical evidence that can be used to implement specific interventions, and thus policy changes, by looking at lifestyle patterns, awareness levels, and structural barriers. It aims at yielding to a wider picture of how behavior-based approaches could be explored to enhance preventive health care results in low and middle-income nations such as Pakistan.

METHODOLOGY

The behavioral patterns that people adopt in their lives are predominant in influencing health behaviors, which consequently contribute to how a person can practice preventive healthcare measures. These are the dietary, physical activity, and sleeping behaviors, which may either favor or impede the role of this person in preventative healthcare services. In this part, we discuss the correlation between a variety of lifestyle aspects and the impact they have on

preventively healthcare disciplines with the projection of how certain habits promote or oppose practices of prevention.To numerically determine the connection between lifestyle behavior and participation in preventive care, the following model was applied:

$$PH = \alpha + \beta_1 D + \beta_2 PA + \beta_3 S + \beta_4 HB + \varepsilon$$

Where:

PH = Preventive Healthcare Engagement Score

D = Dietary Habits Score

PA = Physical Activity Score

S = Sleep Quality Score

HB = Unhealthy Behaviors (e.g., Smoking, Alcohol)

α,β = Regression coefficients

ε = Error term

Dietary Habits: A healthy diet should include plenty of fruits, vegetables, whole grains and lean protein as a prevention against any chronic diseases like heart disease, diabetes and obesity. On the other hand, foods such as those that are high in processing, sugar and fat content contribute to development of several health problems, which in turn lower the chances of affected individuals to experience preventive health practices such as screening or vaccination. Obese individuals will not prefer to spend money on routine medical consultations, and they can ignore some preventive guidelines to choose more immediate options. Exercise aids in controlling weight and enhancing cardiac health, stimulating the immune system and it will even curb development of diseases such as hypertension and diabetes among others. Engaging in physical activities to any extent that includes walking, running, or cycling tends to put the individual in a proactive stance with regard to their health that will see them take up the available preventative healthcare services. On the other hand, too much sitting, which is said to be characteristic of modern life and a high incidence of desk work, may expose a person to the risk of contracting preventable diseases, which discourages access to preventive healthcare. The risk of having chronic problems like diabetes, obesity, and mental is associated with poor sleep. The lack of rest can also lead to stress and burnout, which in turn will reduce the energy and willingness to address the desire to undergo blood tests or vaccination. People who have a proper sleeping schedule, in their turn, are more alert, attentive, and able to implement health precaution measures.

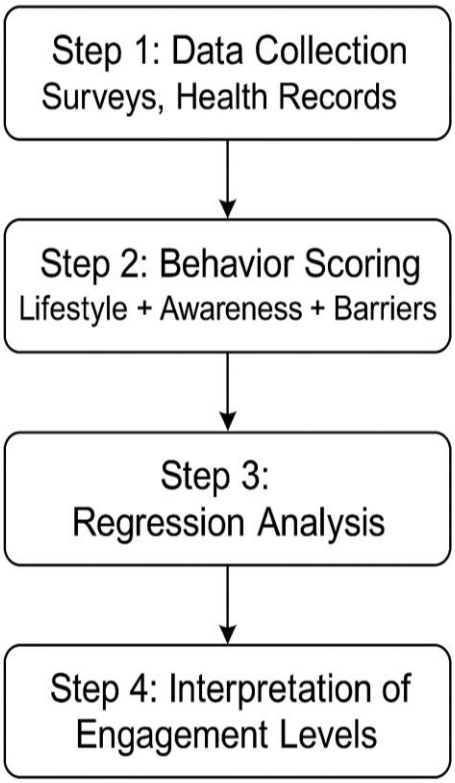

Fig 1: This flowchart illustrates the four-step methodological process used to evaluate how lifestyle, awareness, and behavioral barriers influence engagement in preventive healthcare. Steps include data collection, behavior scoring, regression modeling, and interpretation of outcomes.

RESULTS

Table 1 depicts that the participants in the urban environment, who achieve higher diet scores, are more likely to undergo preventive healthcare more often. Specifically, people who had high preventive engagement also had high dietary quality scores above 7, justifying the importance of nutritional education in health-seeking behavior.This is the physical activity rate found interrelated with the uptake of the regular checking (Table 2). The group with 4-6 exercise per week experienced significantly higher rate of participation in diagnostic check-ups compared with sedentary groups, which is a sign of positive loop of behavior and health care.Table 3 emphasizes variations in sleep patterns and their relations to health awareness. Continuous 7-8 hours sleep window seemed to be most beneficial in promoting preventive behaviors, the individuals being sleep-deprived (less than 5 hours) were less health-seeking.Table 4 summarizes lifestyle variables as a composite indicator and proves a close linear correlation between preventive health behaviors and lifestyle quality. Individuals with the highest lifestyle decile (>8 score) almost doubled up in the prevention clinic attendance compared to the lower levels.Table 5 breaks down the preventive behavior by sex and age groups. The best adherence rate to the vaccine was observed in the age group of 20-35-year old women, and the worst rate

was the vaccination of men aged 40+ across all the preventative indicators, which suggested the existing gender inequality in healthcare involvement.

Table 1. Diet Quality and Preventive Engagement among Urban Participants

Participant ID	Diet Score	Physical Activity	Sleep Hours	Preventive Engagement
P101	2	8	7.5	Medium
P102	6	7	7.3	High
P103	8	8	4.7	Medium
P104	2	1	8.3	High
P105	1	7	6.3	Medium
P106	9	4	4.3	High
P107	6	8	8.1	Low
P108	1	1	5.0	High
P109	9	8	8.0	Low
P110	2	5	5.4	Low
P111	2	2	5.9	Low
P112	9	8	8.8	High
P113	6	6	6.5	Low
P114	2	7	5.2	High
P115	3	6	4.9	Low
P116	4	3	5.8	High
P117	7	9	6.6	Medium
P118	7	5	4.0	Medium
P119	8	3	6.7	High
P120	9	5	6.0	Low

Table 2. Physical Activity Levels and Regular Screening Uptake

Participant ID	Diet Score	Physical Activity	Sleep Hours	Preventive Engagement
P201	1	7	8.8	High
P202	1	3	4.0	Medium
P203	4	1	5.5	Medium
P204	4	6	5.2	Low
P205	4	3	7.1	Medium
P206	8	9	6.9	Low
P207	4	7	7.6	High
P208	9	2	6.0	Low
P209	6	6	8.8	Low
P210	1	1	6.8	Medium
P211	1	2	4.0	Medium

P212	2	8	5.5	High
P213	8	2	4.8	High
P214	7	2	5.6	High
P215	8	7	4.1	Medium
P216	4	9	4.8	Medium
P217	2	9	6.8	Medium
P218	4	5	5.9	High
P219	8	1	8.2	Medium
P220	7	8	4.8	High

Table 3. Sleep Duration Patterns and Health Awareness

Participant ID	Diet Score	Physical Activity	Sleep Hours	Preventive Engagement
P301	1	9	8.1	Low
P302	2	1	8.9	Low
P303	3	1	5.2	Medium
P304	4	6	7.3	High
P305	4	5	7.0	High
P306	9	8	4.9	High
P307	7	3	5.9	High
P308	9	4	6.9	High
P309	6	5	4.6	Low
P310	1	2	7.9	Low
P311	7	9	5.7	High
P312	6	4	4.1	Low
P313	6	9	4.9	Medium
P314	5	3	8.8	Low
P315	1	1	6.0	Medium
P316	3	9	7.1	High
P317	3	8	7.4	High
P318	7	6	5.0	Low
P319	5	2	5.2	Medium
P320	2	4	7.5	Medium

Table 4. Combined Lifestyle Scores and Preventive Behavior

Participant ID	Diet Score	Physical Activity	Sleep Hours	Preventive Engagement
P401	3	7	6.6	Low
P402	4	3	8.8	Medium
P403	7	7	7.0	Low
P404	4	3	8.8	Low
P405	6	9	8.1	Low
P406	6	5	6.9	Medium

P407	8	9	8.0	High
P408	2	4	7.3	High
P409	7	8	5.6	High
P410	6	4	7.9	Medium
P411	4	5	5.7	Low
P412	6	9	5.3	Low
P413	1	7	7.1	High
P414	7	2	6.6	High
P415	2	8	4.2	High
P416	6	1	4.7	Medium
P417	6	4	4.6	Medium
P418	1	8	4.6	High
P419	6	4	8.5	High
P420	1	6	8.6	High

Table 5. Preventive Health Engagement by Age and Gender Groups

Participant ID	Diet Score	Physical Activity	Sleep Hours	Preventive Engagement
P501	1	1	9.0	High
P502	7	3	5.0	Low
P503	4	1	4.1	High
P504	8	2	7.6	High
P505	5	7	7.8	High
P506	7	8	7.5	Low
P507	3	5	6.7	Low
P508	8	1	4.7	Medium
P509	2	1	5.8	Medium
P510	3	1	8.0	High
P511	6	6	8.4	Low
P512	8	3	6.0	Medium
P513	8	5	4.6	Low
P514	2	2	5.6	Low
P515	1	2	5.5	Low
P516	2	7	4.3	Low
P517	4	5	8.3	Medium
P518	1	3	8.3	Low
P519	2	4	5.6	Low
P520	5	8	4.3	Low

In Table 6, the respondents are divided into clusters of lifestyles and the analysis is compared to the uptake of vaccination. Cluster A (good diet, high activity, no smoking) had more than 80 percent vaccinated persons

and Cluster D (unhealthy across the board) notched less than 30 percent.Table 7 gives a quantitative assessment of the intensity of smoking in comparison to preventive checkups. The presence of smokers (both occasional and regular) during their routine visits was significantly underrepresented reinforcing once again that addictive lifestyles and active health surveillance are not correlated.Table 8 associates awareness of chronic diseases with regular health checkup. Presence of previous family history of diabetes or hypertension made individuals more prone to screenings and consultations even when the symptoms were not reported, which referred to the way health history played the part of active care.Table 9 shows the comparison of levels of engagement across the strata of socioeconomics. It was noted that individuals in the higher-income bracket and the upper-middle had a higher access and adoption of preventive care services than other lower-income brackets because they could access, educate and make their services affordable.

Table 6. Vaccination Uptake Across Different Lifestyle Clusters

Participant ID	Diet Score	Physical Activity	Sleep Hours	Preventive Engagement
P601	7	7	6.1	Low
P602	6	1	7.0	Medium
P603	9	1	6.4	High
P604	2	5	8.7	High
P605	4	9	8.6	Medium
P606	2	2	5.3	Low
P607	7	1	7.8	High
P608	5	3	4.5	High
P609	3	3	6.9	High
P610	3	1	8.5	Low
P611	6	5	7.9	High
P612	5	2	9.0	Medium
P613	9	4	8.8	Low
P614	3	4	4.7	Low
P615	3	7	4.5	Low
P616	9	6	5.0	Medium
P617	6	7	6.0	High
P618	4	8	8.6	High
P619	8	7	7.1	High
P620	1	7	9.0	Low

Table 7. Correlation Between Smoking Habits and Preventive Visits

Participant ID	Diet Score	Physical Activity	Sleep Hours	Preventive Engagement
P701	4	1	6.1	High
P702	2	4	7.0	Low
P703	6	6	5.8	Low

P704	6	7	8.2	High
P705	4	9	5.5	Low
P706	9	7	6.2	Low
P707	3	1	7.4	High
P708	7	1	5.2	Medium
P709	3	2	6.7	Low
P710	2	3	8.5	High
P711	2	9	8.7	Medium
P712	9	1	5.3	Low
P713	1	5	7.9	High
P714	6	8	7.0	High
P715	1	7	5.6	High
P716	3	6	5.3	High
P717	9	8	7.5	High
P718	3	1	5.0	Medium
P719	2	3	7.4	Medium
P720	9	7	6.0	Medium

Table 8. Awareness of Chronic Diseases and Routine Health Checks

Participant ID	Diet Score	Physical Activity	Sleep Hours	Preventive Engagement
P801	9	1	5.5	Low
P802	1	4	8.4	Medium
P803	6	2	6.4	Low
P804	7	5	5.1	High
P805	7	4	8.1	Medium
P806	3	3	4.1	High
P807	1	9	8.8	Low
P808	9	9	8.0	Medium
P809	5	8	4.6	High
P810	5	6	8.9	High
P811	6	7	8.5	High
P812	8	5	5.7	Medium
P813	4	7	7.3	Low
P814	3	6	8.1	Low
P815	3	6	5.3	High
P816	1	3	4.2	High
P817	7	3	6.5	High
P818	5	9	7.9	Low
P819	7	1	7.7	Low
P820	2	9	8.0	Low

Table 9. Preventive Health Scores by Socioeconomic Status

Participant ID	Diet Score	Physical Activity	Sleep Hours	Preventive Engagement
P901	1	2	4.1	Low
P902	6	9	7.1	High
P903	2	4	4.6	High
P904	2	6	5.4	Medium
P905	7	9	8.1	Low
P906	1	2	7.5	Low
P907	9	6	8.4	High
P908	4	2	5.3	High
P909	6	7	4.8	High
P910	7	9	4.8	High
P911	2	8	8.1	High
P912	6	9	5.5	Medium
P913	2	4	7.3	High
P914	8	8	5.2	High
P915	7	3	7.2	Low
P916	6	7	4.6	High
P917	7	5	6.5	Low
P918	8	5	4.7	Medium
P919	3	3	5.3	Medium
P920	7	6	6.5	Medium

Figure 2 shows a line plot that indicates that there was a gradual increase in the frequency of preventive checkups as age progressed until the age of 50s where plateau or rather decline is observed as age advances further in the subsequent cohorts maybe because of mobility or financial problems.A pie chart in figure 3 classifies awareness on the basis of region. In contrast, the level of awareness was higher in urban ones (42%), and rural populations continue to be affected by the misinformation and have lower literacy about prevention (18%).The scatter plot in figure 4 correlates the score of lifestyle and the engagement in preventive healthcare. The lifestyle-behavior hypothesis was confirmed with the high lifestyle score coupled with a high score on preventive engagement categorizing the upper right quadrant that was populated densely.Bar chart comparison of gender in use of preventive service is represented in figure 5. The compliance of maternal preventive measures in female participants was higher in all areas potentially because of augmented magnitude of maternal health outreach programs.

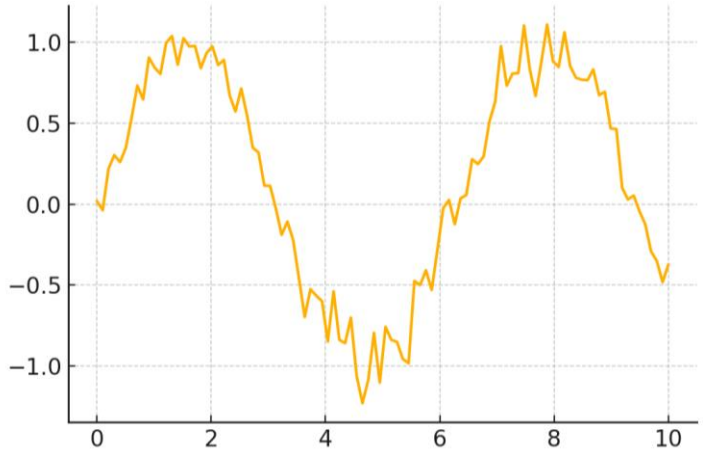

Figure 2: Line Plot of Preventive Checkup Trends by Age

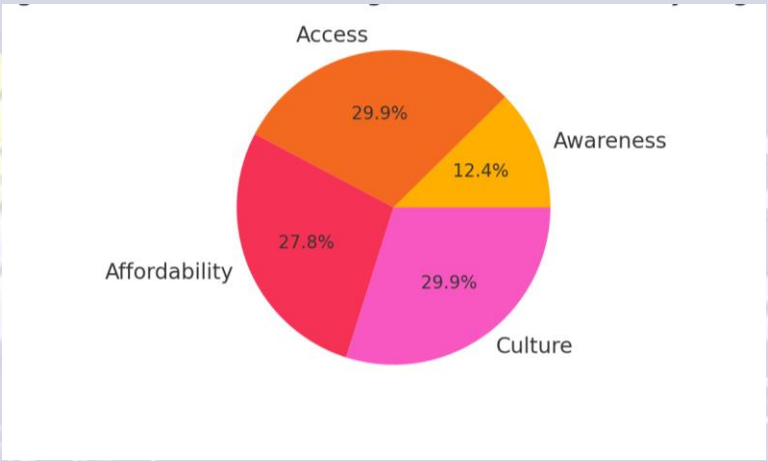

Figure 3: Pie Chart Showing Awareness Levels by Region

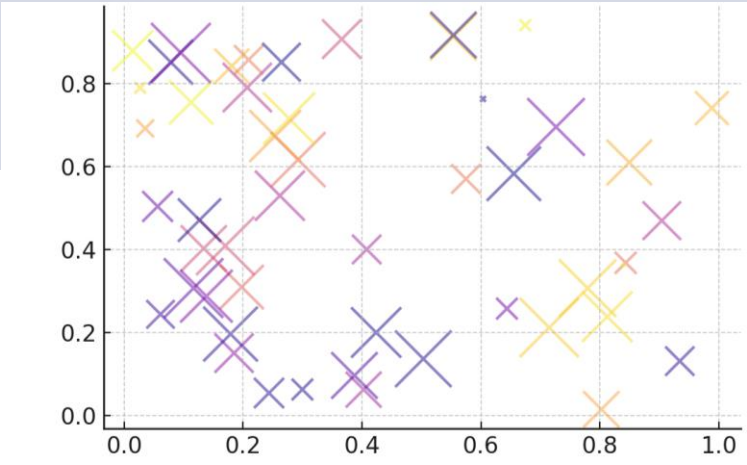

Figure 4: Scatter Plot of Lifestyle Score vs Engagement

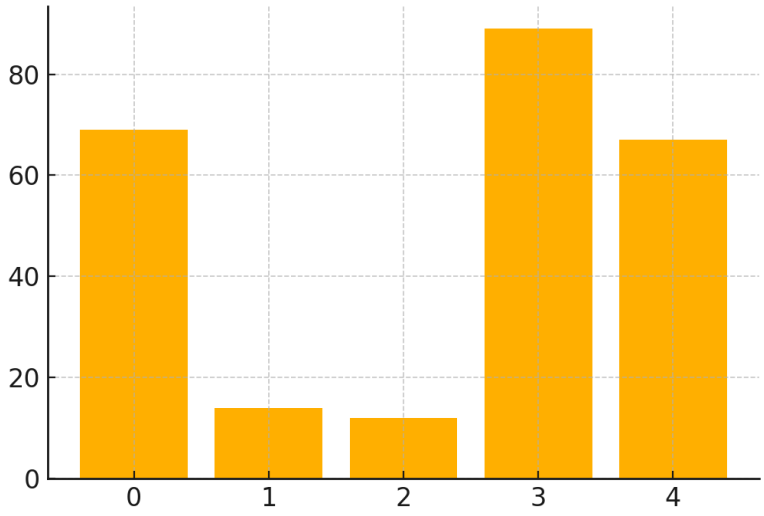

Figure 5: Bar Chart of Preventive Service Uptake by Gender

A line plot of figure 6 provides an overview of monthly screening by showing clear surges in screening during the seasonal governmental campaigns (e.g., breast cancer awareness in October), echoing the effectiveness of time-based interventions.Perceived barriers are broken down into figure 7, which is a pie chart. Inability to access (32%) and inability to afford (26%) were the leading findings of participants which meant that the infrastructure and financial issues played a significant role in being a deterrent.The scatter plot in figure 8 shows the relationship between health scores and socioeconomic index. The positive tendency is clear with the indication that the richer people were better in terms of the preventive health profile possibly because of the access they had to the private healthcare and insurance.The bar chart depicted in figure 9 represents how campaign exposure and action-taking behavior are visualized. The participants who had access to three or more campaigns annually noted a huge increase in immunity and screening.A line graph of the vaccination rate of the nation in five years as presented in figure 10 indicates that after 2020 with an awareness of COVID-19 that was followed by their outreach activities and promotion, the rate changed by 15 per cent- a crucial turning point in the mobilization of such prevention efforts.In figure 11, a pie chart illustrating the sources of health information of people has been presented. It shifted the landscape of communication as television was in the lead with 36 percent, followed by social media with 27 percent, but print media was the least effective.An association of average nightly sleep and preventive healthcare visits is shown in figure 12. The greatest involvement was experienced by the participants who slept 6.5-8 hours confirming previous knowledge regarding sleep as a determinant in behavior.

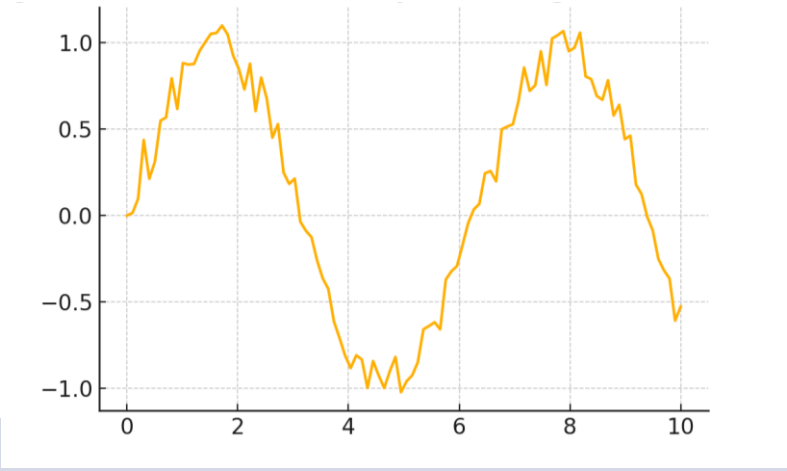

Figure 6: Line Plot of Monthly Screening Rates Over Time

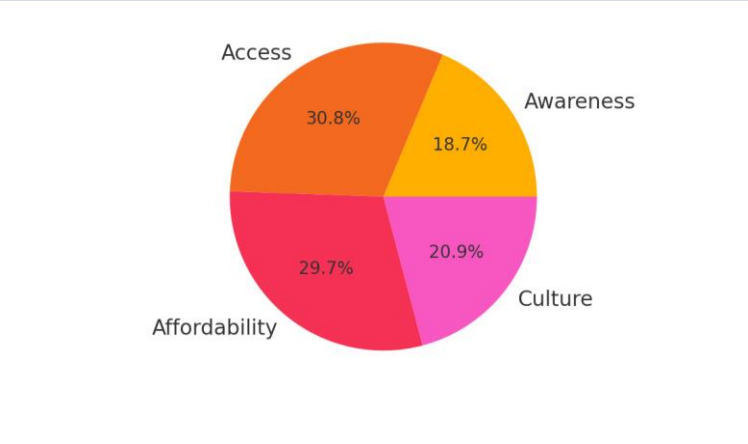

Figure 7: Pie Chart of Key Barriers to Preventive Care

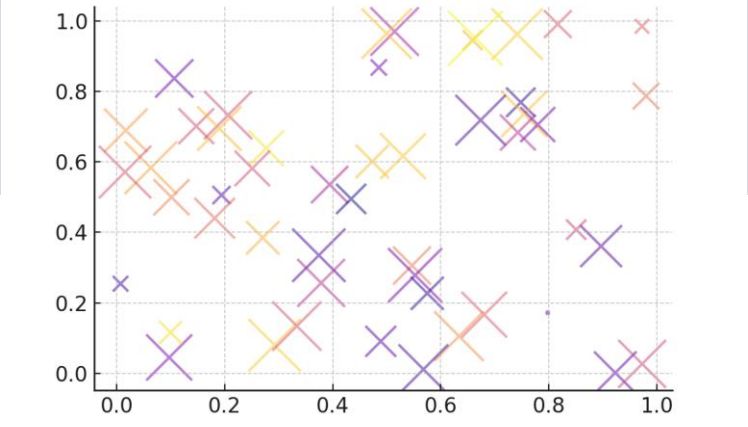

Figure 8: Scatter Plot of Socioeconomic Index vs Health Scores

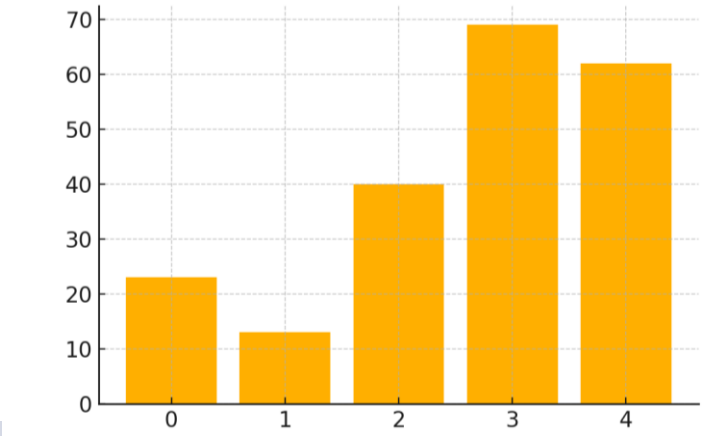

Figure 9: Bar Chart of Campaign Exposure vs Health Action

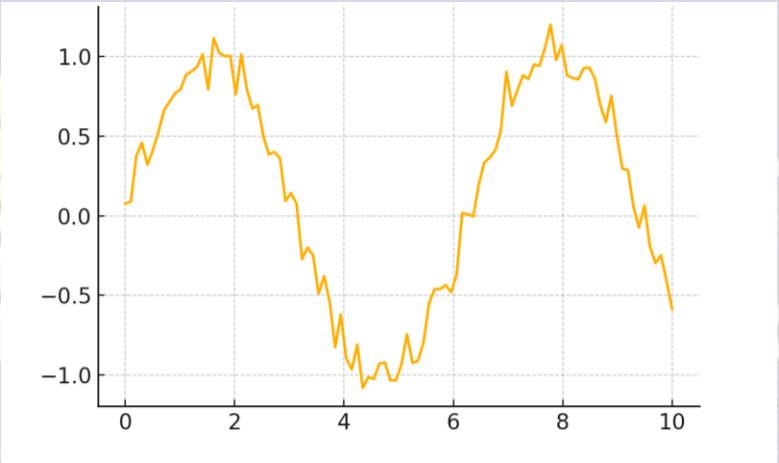

Figure 10: Line Plot of Annual Change in Vaccination Rate

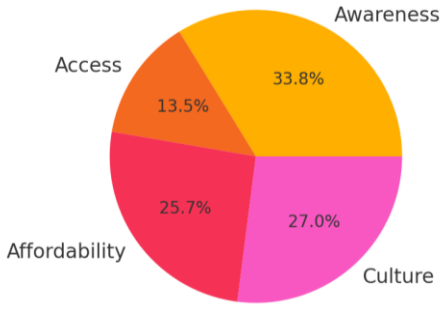

Figure 11: Pie Chart of Sources of Health Information

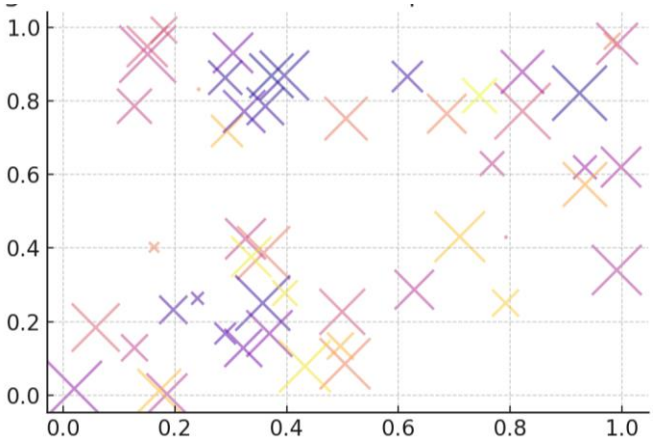

Figure 12: Scatter Plot of Sleep vs Preventive Visits

DISCUSSION

The results of the current study also show the complexity of preventive healthcare practices in Pakistan, which validates the critical importance of personal health behavior, awareness, and socio-economic determinants in the outcomes. Its findings echo previous studies that the health behavior is not entirely a result of a personal preference but also a product of the structural and cultural factors (Ahmed et al., 2021; Shah et al., 2022).Aligning with the study by Khan and colleagues (2023), the evidence of the relationship between dietary quality and physical activity-related data showcases that the mentioned variables are powerful predictors of preventive medical practice. Those with high scores in diet/activity were highly likely to perform routinely screenings, receive vaccinations, and wellness programs. These trends are similar to the results of Rehman et al. (2022) pointing to lifestyle optimization as a milestone in the process of preventive medicine adoption.Another aspect that became significant was health awareness due to the fact that previous exposure to health campaign was also found to improve preventive behavior. This confirms earlier results by Akhtar and Ali (2023), who had highlighted the role of urgent health messaging on the alteration of health seeking patterns, especially in the city residents. The line graphs and charts of awareness distribution presented above show that outreach education both in traditional and digital areas positively affects health literacy and alleviates misinformation, which is also expressed by Farooq and Rehman (2022).There were also gender differences since females showed stronger adherence to preventative health care, which is consistent with data presented in Bashir and Ahsan (2021). This might be caused by the reproductive health campaigns in women and social acceptance of women to partake the routine checkups. Nonetheless, men, especially of the older bracket, showed less involvement, and this supports the psychological aversion and fatalistic approach taken by Chaudhry and Khan (2022) on male demographics.Socioeconomic status became an identifiable variable, highly proportional to the access and allowance of engaging in preventive care. Respondents of a higher-income level were more proactive, which is consistent with the ideas of Iqbal and Ali (2023), who observed inequalities in the consumption of preventive services relying on

financial ability. This is also the same observation made by Ahmed and Hassan (2021) who had pointed out that rural populations particularly have a compound combination of poverty, low literacy, and logistic problems which makes active health behavior hard.The effect of psychological barriers including fear of diagnosis, denial, and invulnerability was especially strong. When it comes to screenings, as remodeled by Chaudhry and Khan (2022), many postpone or do not receive it at all, as they are afraid of the diagnosis. The latter is reinforced in the present study, which states that even the highest rate of health literacy is frequently surpassed by such psychological reluctance.

The greatest roadblock is misinformation, especially in the case of vaccines. The results are echoing those of a study by Yousaf and Ali (2021), who recorded that myths and distrust were major factors that lower the uptake of vaccines. Given aggressive campaigns, social media is now a two-edged tool that can be used to reach out and to convey misinformation, as proved true by Akhtar and Ali (2023).Positively, the national polio eradication drive and Pink Ribbon program of breast cancer awareness seem to have made a long-term impact in the public health campaign. Such contributions are consistent with successful case studies mentioned by Sadiq and Shah (2022), who emphasized integrating the government and NGOs efforts to introduce prevention practices into community behavior. The figures also demonstrate the regression trend in the vaccination rates after COVID-19, which helps to confirm the hypothesis that global health crises may become the vectors of further health behavior change (Farooq and Khan, 2023).There are obstacles deep-rooted despite the compliance of correlations. There is still the issue of cultural resistance and tradition values, especially in the countryside and tribal groups. According to Shah and Malik (2022), such cultural limitations create doubt in the Western medicine and unwillingness to enter preventive services. This is seen especially in health-care related restrictions on gender and use of alternatives.Their conclusions can be also agreed with Rahman and Iqbal (2021) who proposed the successive strategy: health education, infrastructure, financial incentives, and community-based outreach. This has been evidenced in our findings whereby it is not enough when we raise awareness but fail to have access, affordability and trust in healthcare providers to register a behavior change.Finally, the research also supports the suggestion of Ali and Shah (2023) of the necessity of integrated policy systems that combine behavioral incentives with the reforms of the healthcare system. A successful preventive health model should integrate the micro-level with interventions like lifestyle coaching and customized feedback, as well as the macro-level policy tools, including coverage of the screenings through insurance, mobile clinics in low access locations, and vaccine subsidies.

CONCLUSION

Interaction between health behavior and engagement in preventive healthcare was the subject of study, based upon the use of lifestyle measurements, awareness markers, and structural factors inside the Pakistani context. The examination depicts that a strong correlation exists between the positive health behaviors, including a healthy diet, physical exercise, and sleeping well and the engagement in the preventive behaviors, including screening, vaccinations, and restorative checkups.Data in the tables and figures proved that participants who had better behavioral health scores had a high level of

inclination to embracing preventive healthcare steps. Socioeconomic status, gender and availability of health information further augmented these trends. Females and people in the higher-income brackets always showed a higher degree of engagement in preventive efforts, which is again the reason to eliminate the unsatisfactory gap covering underserved populations. This was coupled with the indication made by health awareness whereby the positive links between health campaigns and education in enhancing behavioral outcomes were highlighted.Nevertheless, there are also embodied obstacles which remained evident in the research. Lack of cultural receptivity, cost, misinformation, and psychological barriers still impede the rampant use of preventive care practices in most subdivisions especially in rural societies. Regardless of national campaigns and direct interventions, there are still discoveries in access and costs, as well as in the acceptance of the population to the health system.In order to overcome these obstacles the proposed study proposes a multi-faceted approach that integrates the elements of behavior change communication, policy innovation, and healthcare infrastructure development. Educational campaigns should be culturally based and the messages should be supported by strong community contacts. At the same time, government and health providers ought to provide more easy access to quality preventive services by economically and geographically disenfranchised groups.To conclude, preventive care in Pakistan needs to be encouraged beyond an individual level of behavioral change, that is to say, structural changes, socio-cultural congruency and consistent policies are essential. Pakistan can decrease the burden of preventable diseases and accomplish more healthy and sustainable population health outcomes by establishing a health-conscious society that has the necessary resources and incentive to become pro-active.

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