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LIFESTYLE CHANGES IN CARDIOVASCULAR DISEASES: A STATISTICAL APPROACH TARGETING KNOWLEDGE, ATTITUDE AND PRACTICE IN KARACHI, PAKISTAN

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Abstract
Cardiovascular diseases (CVDs) are a leading cause of death in the world and can be significantly controlled through lifestyle modifications. This study has been conducted to understand the knowledge, attitudes, and practices in a populated metropolitan to develop targeted interventions for preventing the cardiovascular diseases. The study was conducted through a pretested questionnaire to assess knowledge, attitude and practice of the general population. The dependent variables include Knowledge score, Attitude score, Practice score and Total score, while the independent variables were; Age groups, Gender, Education background and Education level. The data was statistically analyzed by SmartPLS 4.0.8.7 for partial least squares structural equation modeling (PLS-SEM). Our data shows that higher level of awareness of CVD's improves attitude and practice of lifestyle changes in CVDs. Overall, the path coefficients and their significance suggest that age, gender, education background and level are significant predictors of the outcome variables in the model. The study discusses various factors such as socialization, education, and access to information which need to be addressed for improving prevention outcomes in CVDs. It is highly imperative that improving knowledge, attitude and practices of a population to prevent the cardiovascular diseases requires a comprehensive approach that involves education, outreach, engagement, and evaluation, encompassing all age groups, genders and education levels.

INTRODUCTION

The World Health Organization (WHO) predicts that by the end of 2030, over three-quarters of global deaths will be due to non-communicable diseases. Among these, cardiovascular diseases (CVDs) are the leading cause of morbidity and mortality worldwide, despite significant advancements in healthcare (1, 2). The WHO categorizes CVDs to include coronary heart disease (CHD), peripheral arterial disease, stroke, rheumatic and congenital heart disease, and deep vein thrombosis. Risk factors for CVDs are classified into modifiable and non-modifiable factors. Modifiable factors include high blood pressure, smoking, hyperlipidemia, diabetes, sedentary lifestyle leading to overweight or obesity, anxiety, alcohol intake, and oral contraceptives. Non-modifiable risk factors include age, gender, and heredity. Urbanization and the prevalence of these risk factors have led to a significant increase in CVD incidence among younger populations. Lack of awareness and knowledge about CVD symptoms and related aggravating factors has also contributed to the rising prevalence of CVDs. (3-6). Ischemic heart disease and stroke are the two leading contributors of the global CVD burden (7-9).

Lifestyle modification is a key strategy in preventing cardiovascular diseases (CVDs), despite the challenges posed by various factors and barriers. Sedentary lifestyles contribute to overweight and obesity, particularly in urban areas, where mobility is lower compared to rural areas. A study in Nowshera, Pakistan, from September 2020 to December 2021, found a high prevalence of obesity in females compared to males. Aging is associated with increased CVD complexity and complications. High sodium intake is a common factor contributing to CVDs, directly impacting blood pressure, especially systolic blood pressure, and cardiovascular morbidity and mortality. Diets high in sodium and low in cardioprotective factors, such as vegetables, increase CVD risk, while moderate sodium consumption (2-6 g/day) is recommended for mortality reduction. Smoking, including passive smoking, increases the risk of coronary heart disease by approximately 30% (7, 10-23).

Partial least squares structural equation modeling (PLS-SEM) is a statistical technique used to analyze relationships between multiple variables in a model. It is valuable for various fields, including knowledge, attitude, and practice (KAP) studies, which aid in developing tailored disease prevention programs. PLS-SEM is beneficial for KAP studies as it evaluates both individual variable relationships and the overall model structure, identifying key factors for understanding knowledge, attitudes, and practices and improving program efficiency (24-26).

Methods

Study Design and Population

Pakistan ranks fifth among the most populated countries in the world with a population density of approximately 742 people per mile2 (27, 28). Karachi is not only the most populated city of the country, but it is also the world's second most populated city as well. The KAP studies in such population are good indicators to predict awareness and behavior in urban areas (29). The data for this study was collected through online questionnaire using a stratified random selection of the participants. The participants were divided into strata based on their age groups, gender, education background and level of education. The identities of the participants were not disclosed instead demographic data was collected with consent, thus waiving off the ethical approval from the committee. The cross-sectional study was conducted in the last quarter of 2022 among general and diverse population of Karachi. The sample size for large population is calculated using Raosoft online calculator and Cochran formula (30, 31).

Data collection procedure and tools

The questionnaire was designed based on information gathered from literature survey and similar studies conducted in the past (32-34). It encompasses close-ended questions about demographics, knowledge, attitude and practice.

Statistical analyses

The data obtained through an online survey was downloaded as an MS Excel sheet. Responses for all the question for knowledge, attitude and practice were collected on a binary scale where 0 represented 'No' and 1 represented 'yes'. Data was coded to represent the responses in numerical form for further analysis. The coded data was first imported to Statistical Package for Social Sciences (IBM SPSS Statistics) for demographic and descriptive analysis. Then, data was imported to SmartPLS 4.0.8.7 for partial least squares structural equation modeling (PLS-SEM) (35). Three models were created. Model 1 aimed to assess the effect of demographics on knowledge, attitude and practice of lifestyle changes for CVDs. Model 2 aimed to assess the effect of demographics on the overall behavior for lifestyle changes for CVDs. Model 3 assessed the relationship among knowledge, attitude and practice of lifestyle changes for CVDs. For all three models, measurement model assessment was made to establish reliability and validity of the items and the constructs. Next, structural model assessment was made to evaluate explanatory power of model and path coefficient size and significance.

Results

Demographic Analysis

The study's sample comprised 1314 individuals, varying in age, gender, education, and cardiovascular disease (CVD) status. Most participants (53%) were aged 18-35, with the 31-43 age group representing 22%. Only 4% were aged 70 or older, indicating a predominantly young sample. Females constituted 63% of the sample. 57% had a health education background, while 43% had non-health education. Regarding education level, 47% had a Bachelor's degree, 33% had completed university education, and 20% had a postgraduate degree. 89% of participants knew someone with CVD. These demographic findings suggest a relatively young, balanced gender sample with a high proportion of college-educated individuals, and knowledge of CVD among participants.

Descriptive Analysis

This study has been conducted to measure the levels of knowledge, attitude, and practice in a certain population or group of people. The mean value is a statistical measure of central tendency that represents the average score of the three parameters, where a score of 3 or higher suggests a good level of knowledge, attitude, and practice. Two important measures of the shape of a distribution: skewness and kurtosis. Skewness measures the asymmetry of a distribution, while kurtosis measures the degree of peakedness or flatness of a distribution (36). In general, a symmetric distribution has a skewness of zero, while a distribution with a skewness value greater than zero is said to be positively skewed, and a distribution with a skewness value less than zero is said to be negatively skewed (37). A distribution with a kurtosis value of zero is said to have a normal distribution, where the distribution is symmetrical, and the data is evenly distributed around the mean. However, a distribution with a kurtosis value greater than zero is said to have a leptokurtic distribution, which means it has more scores in the tails and fewer scores in the middle. Conversely, a distribution with a kurtosis value less than zero is said to have a platykurtic distribution, which means it has fewer scores in the tails and more scores in the middle (36). Therefore, if the skewness and kurtosis values are both within the range of -1 and +1, it suggests that the data is approximately normally distributed, which means that the data is symmetric, and the majority of the scores fall around the mean. However, it's important to note that while a normal distribution is a common assumption in statistical analysis, it may not always be the case in real-world scenarios, and other distributions may be more appropriate to describe the data.

Measurement Model Assessment

In the field of social science research, measurement model assessment is a crucial step in evaluating the reliability and validity of a given model. Reliability refers to the consistency and stability of the measurements taken, while validity refers to whether the measurements accurately represent the underlying construct or concept being measured.

One commonly used metric for evaluating item consistency is outer loading, which measures the strength of the relationship between each item and its underlying construct (38). All outer loadings in this study are above accepted threshold for acceptable outer loading values is 0.708 or higher which suggests that the items are consistent in measuring their respective constructs.

Another important aspect of construct reliability is composite reliability, which measures the internal consistency of a construct by assessing the degree to which its constituent items are related to one another. Composite reliability values in this study are above 0.7 which are generally considered acceptable (39) indicating that the construct is reliable.

Convergent validity, on the other hand, assesses the degree to which different measures of the same construct are related to one another. One commonly used metric for evaluating convergent validity is the average variance extracted (AVE), which assesses the proportion of variance in a construct that is captured by its constituent items. AVE values above 0.5 are generally considered acceptable (40), indicating that the construct has convergent validity.

By evaluating outer loading, composite reliability, and AVE, it is established that the consistency and accuracy of the items and constructs is sufficient.

The Heterotrait-Monotrait (HTMT) ratio is commonly used to assess the discriminant validity of constructs in statistical models (41). A HTMT ratio of below 0.85 is considered an acceptable benchmark for determining whether the constructs are distinct from each other. Studies have suggested that the HTMT ratio is a more reliable measure of discriminant validity than traditional methods. All ratios were below 0.85, indicating the model's constructs have satisfactory discriminant validity (41).

Structural Model Assessment

Model 1 was developed to assess the effect of demographics on the score of knowledge, attitude and practice. The values in Table 5 represent the Variance Inflation Factor (VIF) values of the variables included in a statistical model. VIF is used to assess multicollinearity among the variables in the model, and a value of 1 indicates no correlation between the variables, while higher values indicate increasing levels of correlation. All variables have VIF values below 5, indicating low levels of multicollinearity. Age has the highest VIF value of 1.367, which is still relatively low and should not cause any issues in the model (42). Therefore, the variables in the model have little to no correlation with each other, and multicollinearity is not a concern. This strengthens the validity of the statistical model and the results obtained from it.

Effect of Demographics on Attitude, Knowledge, and Practice

The table provides the path coefficients and their significance in a statistical model. Path coefficients represent the strength and direction of the relationship between two variables, with positive coefficients indicating a positive relationship and negative coefficients indicating a negative relationship. The statistical significance of the path coefficients is assessed by the T-statistic and P-value (43).

Age has a significant positive effect on Attitude Score (β = 0.067, P-value = 0.048) and Practice Score (β= 0.114, P-value = 0.035), but not on Knowledge Score (β = 0.036, P-value = 0.280). The attitude and practice of the sample was found better with increase in age.

Awareness has a significant positive effect on all three scores (Attitude Score: β = 0.355, P-value = 0.000; Knowledge Score: β = 0.169, P-value = 0.006; Practice Score: β = -0.051, P-value = 0.597). The sample data shows that higher level of awareness of CVD's improves knowledge, attitude and practice of lifestyle changes for CVDs.

Educational background was found to have a significant negative relationship with knowledge scores (β = -0.098, P value= 0.025), while the relationships between educational background and attitude scores (β = -0.013, P value = 0.595) and practice scores (β = -0.010, P value = 0.874) were not statistically significant. Educational level was found to have a significant negative relationship with attitude scores (β = -0.035, P = 0.074) and practice scores (β = -0.064, P = 0.034), but not with knowledge scores (β = -0.027, P = 0.267). As per the sample data, attitude towards lifestyle changes and practice of lifestyle changes declines with increase in level of education.

Gender has a significant negative effect on Attitude Score (β = -0.072, P-value = 0.015), but no significant effects on Knowledge or Practice Scores. Hence, the sample findings show that attitude towards adaptive lifestyle was better among males as compared to female respondents.

Overall, the path coefficients and their significance suggest that Age, Awareness, Educational Background, Educational Level, and Gender are significant predictors of the outcome variables in the model. However, the effects of these predictors vary across the outcome variables, indicating that the relationship between the predictors and the outcomes is complex and nuanced.

The coefficient of determination (R^2) is a statistical measure that represents the proportion of the variance in the dependent variable (the outcome variable) that can be explained by the independent variables (the predictors) in the model (38). The table shows values R^2 for each of the exogenous variables in the statistical model. A higher R^2 indicates that a larger proportion of the variation in the outcome variable can be explained by the predictors (39). The R^2 for Attitude Score is 0.138, indicating that the predictors included in the model explain 13.8% of the variation in Attitude Score. The R^2 for Knowledge Score is 0.054, indicating that the predictors explain only 5.4% of the variation in Knowledge Score. The R^2 for Practice Score is 0.067, indicating that the predictors explain only 6.7% of the variation in Practice Score. The R^2 values indicate that only a small percentage of the variation in the outcome variables can be attributed to the model's predictors. This suggests that the variation in the outcome variables is also influenced by other variables that are not accounted for in the model.\

Effect of demographics on Total Score

Model 2 was constructed to assess the effect of demographics on the total score.

The Table 8 shows the path coefficients, standard deviations, t statistics, p-values, and decision regarding the relationship between the predictor variables and the total score in the statistical model. The path coefficients represent the strength and direction of the relationship between the predictor variables and the total score in the model. Age, Awareness, Educational Level, and Gender have significant relationships with the Total score.

The results indicated that age ($\beta = 0.229$, $p < 0.05$) and awareness ($\beta = 0.779$, $p<0.05$) had a significant positive effect on total score of lifestyles change behavior for CDVs. Educational level($\beta = -0.128$, $p<0.05$) and gender ($\beta = -0.162$, $p<0.05$) had a significant negative effect on total score of lifestyles change behavior for CDVs. On the other hand, educational background did not have a significant effect on total score of lifestyles change behavior for CDVs, ($\beta = -0.101$, $p>0.05$). Specifically, with increase in age and awareness the total score of lifestyles change behavior for CDVs increases, while with increase in educational level score of lifestyle-change behavior for CDVs decreases. Moreover, total score of lifestyle-change behavior for CDVs is lower among the female respondents. However, educational background is not significantly related to the Total score.

These results can be used to better understand the factors that contribute to the Total score and to identify areas for potential intervention or improvement. However, the lack of significant relationship between Educational Background and Total score suggests that this variable may not be a meaningful predictor of the Total score in this model.

Table 9 shows coefficient of determination of Model 2 and its significance. The R^2 value of 0.128 means that only 12.8% of the variance in the dependent variable is explained by the independent variables in the model indicating that the model has a relatively weak explanatory power. The remaining 87.2% of the variance is unexplained and is likely due to other factors that are not included in the model. It's important to note that while a low R^2 value suggests weak explanatory power, it does not necessarily mean that the model is completely useless. A low R^2 value may be acceptable in the cases where the model is used to gain a general understanding of the relationship between variables or to make rough predictions.

Relationship between knowledge, attitude, and practice

Model 3 was created to assess the relationship among knowledge, attitude and practice score. The aim to investigate the relationship between knowledge, attitude, and practice.

Table 10 shows the path coefficients, standard deviations, t-statistics, and p-values for the relationships between attitude, knowledge, and practice. The results indicate that all of the relationships between the variables were statistically significant at the 1% level, indicating strong support for the hypothesized relationships. The path coefficient from attitude to practice was 1.332, indicating that attitude had a strong positive effect on practice. Similarly, the path coefficient from knowledge to attitude was 0.670, indicating a strong positive effect of knowledge on attitude. The path coefficient from knowledge to practice was 0.471, indicating a moderate positive effect of knowledge on practice. Lastly, the path coefficient of indirect effect of knowledge on practice through attitude was 0.893 indicating a strong positive effect of knowledge and attitude on practice. Therefore, knowledge on practice is partially mediated by attitude.

Table 11 shows the coefficient of determination (R^2) for attitude and practice. The R^2 value for attitude was 0.425, indicating that 42.5% of the variance in attitude was explained by the knowledge. Similarly, the R^2 value for practice was 0.639 indicating that 63.9% of the variance in practice was explained by knowledge and attitude.

In conclusion, the results of this study provide strong evidence for the relationships between knowledge, attitude, and practice towards healthy lifestyle modifications for preventing cardiovascular diseases. The findings indicate that knowledge and attitude have a significant positive effect on practice, with knowledge having a stronger effect on attitude than on practice. These results highlight the importance of targeting knowledge and attitudes in interventions aimed at improving practice towards the behavior of interest.

Discussion

The current study evaluated the relationship between knowledge, attitude, and practice towards healthy lifestyle modifications for the prevention of cardiovascular diseases (CVDs). Our findings demonstrate that knowledge significantly impacts both attitude and practice, with attitude acting as a partial mediator between knowledge and practice. Specifically, the strong positive correlation between knowledge and attitude (path coefficient = 0.670) suggests that enhancing knowledge leads to improved attitudes towards healthy lifestyle behaviors. In turn, these improved attitudes strongly influence the adoption of healthier practices (path coefficient = 1.332). However, while knowledge directly affects practice (path coefficient = 0.471), its indirect effect through attitude (path coefficient = 0.893) indicates that the role of attitude is crucial in translating knowledge into action.

The study's findings align with existing literature, which emphasizes the importance of knowledge in shaping health-related behaviors. Education campaigns have been shown to positively influence public attitudes towards disease prevention, particularly in older populations who may be more receptive to health messages due to accumulated life experiences and exposure to healthcare interventions. This may explain why older participants in this study demonstrated better attitudes and practices compared to younger participants, who may not perceive CVDs as an immediate threat.

Gender differences observed in knowledge, attitudes, and practices suggest that male participants, likely benefiting from higher literacy rates and societal privileges, scored higher across all dimensions. This underscores the need for targeted interventions that address gender disparities in health education. Women, who may face barriers to accessing health information, should be specifically engaged in educational efforts to ensure equitable health outcomes.

Additionally, participants with a background in health-related fields exhibited deeper knowledge of CVD prevention, reflecting the influence of formal education on health awareness. This finding highlights the need for continued efforts to incorporate health education into general educational curricula, not just in specialized fields, to equip all individuals with the necessary knowledge to prevent CVDs.

Despite the positive correlation between knowledge and practice, the relatively lower direct impact of knowledge on practice suggests that simply increasing awareness may not be sufficient to drive behavior change. Other factors, such as access to resources, social support, and motivation, likely play a role in whether individuals act on their knowledge. Future interventions should adopt a holistic approach that includes not only education but also strategies to address these additional factors, ensuring that individuals are both willing and able to adopt healthier lifestyle practices.

In conclusion, the study highlights the importance of knowledge and attitudes in shaping healthy behaviors for CVD prevention. To maximize the impact of public health interventions, efforts should focus on enhancing knowledge, fostering positive attitudes, and addressing the practical barriers that prevent individuals from adopting healthier lifestyles (44-53).

Recommendations

Based on the findings of this study, several recommendations can be made to further enhance the prevention of cardiovascular diseases (CVDs) through improved knowledge, attitudes, and practices. First, targeted educational programs should be developed, particularly for younger populations and less educated groups, to bridge the gap between knowledge and the adoption of healthy practices. These programs should focus on raising awareness about the long-term risks of CVDs, even at a younger age, and emphasize the benefits of early lifestyle modifications.

Additionally, gender-specific interventions may be necessary to address the discrepancies in knowledge, attitudes, and practices observed between male and female participants. Outreach efforts should be designed to ensure that women, who may have less access to health-related information and resources, are equally empowered to make informed decisions about their cardiovascular health.

Future research should explore the role of digital platforms and mobile health applications in delivering health education, particularly in younger age groups that are more tech-savvy. These platforms could serve as effective tools for disseminating information, tracking lifestyle changes, and providing personalized feedback to individuals. Moreover, longitudinal studies are needed to assess the long-term impact of improved knowledge and attitudes on sustained behavior change and CVD outcomes.

Finally, future studies should investigate the impact of socio-economic factors, cultural norms, and access to healthcare services on knowledge, attitudes, and practices. Understanding these broader determinants will help in designing comprehensive and culturally sensitive interventions that can effectively reduce the burden of CVDs across diverse populations.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Table 1 Demographics

Demographics	Sub-group	Frequency	Percent
Age (Years)	18-30	696	53
	31-43	288	22
	44-56	174	13
	57-69	102	8
	70+	54	4
	Total	1314	100
Gender	Male	486	37
	Female	828	63
	Total	1314	100
Educational Background	Health Care	750	57
	Non-Healthcare	564	43
	Total	1314	100
Educational Level	Undergraduate	618	47
	Graduate	438	33
	Postgraduate	258	20
	Total	1314	100
Do you know anyone who suffer from cardiovascular diseases such as Hypertension, Heart failure, Stroke or Angina?	No	141	11
	Yes	1173	89
	Total	1314	100

Table 2 Descriptive Statistics

	N	Mean	Std. Deviation	Skewness	Kurtosis	Min	Max
Knowledge Score	1314	3.655	1.059	-0.538	-0.195	0	5
Attitude Score	1314	3.253	1.223	-0.148	-0.698	0	5
Practice Score	1314	3.511	1.260	-0.660	-0.023	0	5
Total	1314	10.420	2.949	-0.093	-0.705	2	15

Table 3 Reliability and Convergent Validity

Exogenous variable	Path	Outer Loading	Composite reliability	Average variance extracted
Attitude Score	Att1 <- Att	0.879	0.883	0.603
	Att2 <- Att	0.734		
	Att3 <- Att	0.714		
	Att4 <- Att	0.76		
	Att5 <- Att	0.786		
Knowledge Score	Kn1 <- Kn	0.745	0.853	0.537
	Kn2 <- Kn	0.78		
	Kn3 <- Kn	0.743		
	Kn4 <- Kn	0.682		
	Kn5 <- Kn	0.711		
Practice Score	Prac1 <- Prac	0.765	0.876	0.591
	Prac2 <- Prac	0.69		
	Prac3 <- Prac	0.98		
	Prac4 <- Prac	0.643		
	Prac5 <- Prac	0.722		
Total	Total<-Attitude	0.933	0.735	0.503
	Total<-Knowledge	0.421		
	Total<-Preactice	0.679		

Table 4 Discriminant Validity -HTMT Ratios

	Attitude Score	Knowledge Score	Practice Score
Attitude Score			
Knowledge Score	1.222		
Practice Score	1.248	1.246	

Table 5 Variance Inflation Factor (VIF)

	Attitude	Knowledge	Practice
Age	1.367	1.367	1.367
Awareness	1.046	1.046	1.046
Educational Background	1.188	1.188	1.188
Educational Level	1.141	1.141	1.141
Gender	1.062	1.062	1.062

Table 6 Size and Significance of Path Coefficients

Path	Path coefficient	Standard deviation	T stat	P values	Decision
Age -> Attitude Score	0.067	0.034	1.979	0.048	Supported
Age -> Knowledge Score	0.036	0.033	1.080	0.280	Not Supported
Age -> Practice Score	0.114	0.054	2.112	0.035	Supported
Awareness -> Attitude Score	0.355	0.080	4.446	0.000	Supported
Awareness -> Knowledge Score	0.169	0.062	2.726	0.006	Supported
Awareness -> Practice Score	-0.051	0.096	0.529	0.597	Not Supported
Educational Background -> Attitude Score	-0.013	0.025	0.531	0.595	Not Supported
Educational Background -> Knowledge Score	-0.098	0.044	2.236	0.025	Supported
Educational Background -> Practice Score	-0.010	0.064	0.159	0.874	Not Supported
Educational Level-> Attitude Score	-0.035	0.020	1.789	0.074	Supported
Educational Level -> Knowledge Score	-0.027	0.024	1.110	0.267	Not Supported
Educational Level -> Practice Score	-0.064	0.030	2.120	0.034	Supported
Gender -> Attitude Score	-0.072	0.029	2.433	0.015	Supported
Gender -> Knowledge Score	0.048	0.030	1.604	0.109	Not Supported
Gender -> Practice Score	-0.086	0.072	1.193	0.233	Not Supported

Table 7 Coefficient of Determination

	R^2	Standard deviation	T stat	P values
Attitude Score	0.138	0.026	5.211	0.000
Knowledge Score	0.054	0.013	4.174	0.000
Practice Score	0.067	0.013	5.235	0.000

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Table 8 Path coefficients size and significance

	Path Coefficient	Standard deviation	T statistics	P values	Decision
Age -> Total	0.229	0.036	6.299	0.000	Supported
Awareness -> Total	0.779	0.143	5.442	0.000	Supported
Educational Background -> Total	-0.101	0.071	1.431	0.153	Not Supported
Educational Level-> Total	-0.128	0.028	4.575	0.000	Supported
Gender -> Total	-0.162	0.067	2.429	0.015	Supported

Table 9 Coefficient of determination

	R^2	Standard deviation	T statistics	P values
Total	0.128	0.020	6.425	0.000

Table 10 Path Coefficient Size and Significance

	Path Coefficient	Standard deviation	T statistics	P values	Decision
Attitude -> Practice	1.332	0.051	25.894	0.000	Supported
Knowledge -> Attitude	0.670	0.019	35.374	0.000	Supported
Knowledge -> Practice	0.471	0.060	7.855	0.000	Supported
Knowledge -> Attitude -> Practice	0.893	0.043	20.753	0.000	Supported

Table 11 Coefficient of determination

	R^2	Standard deviation	T statistics	P values
Attitude	0.425	0.023	18.835	0.000
Practice	0.639	0.017	37.316	0.000

Figure 1 Structural Model

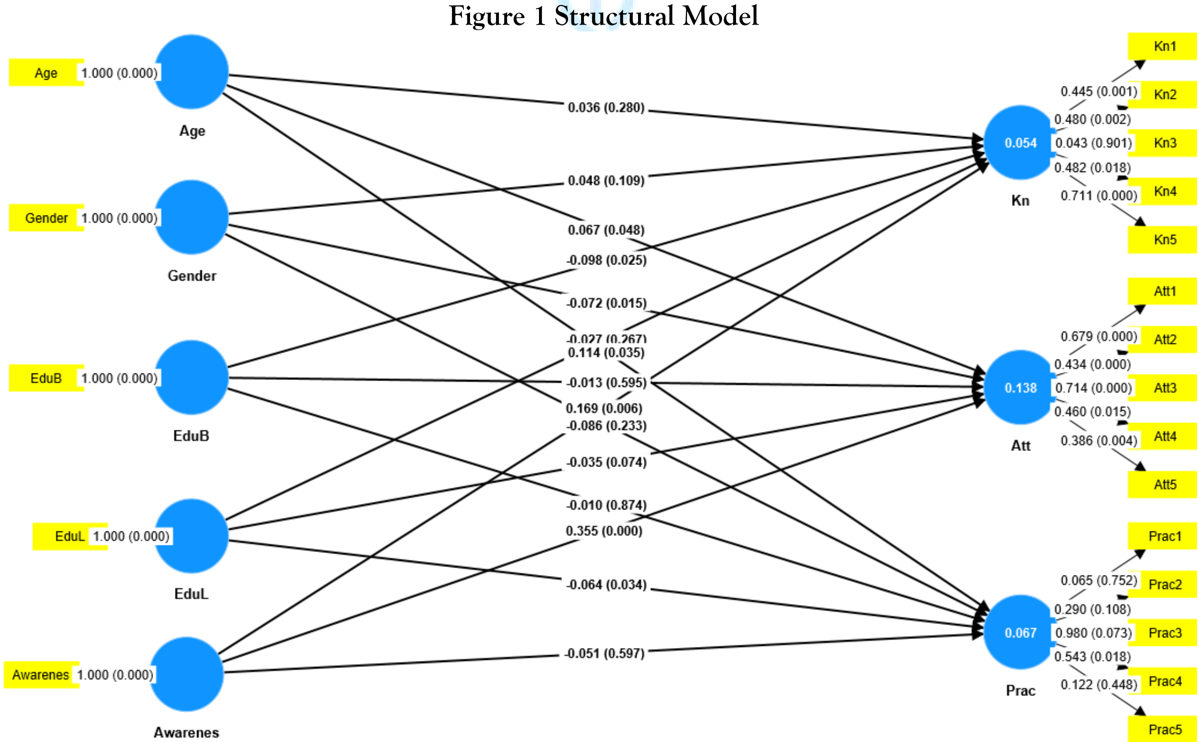

Figure 2 Effect of demographics on Total Score

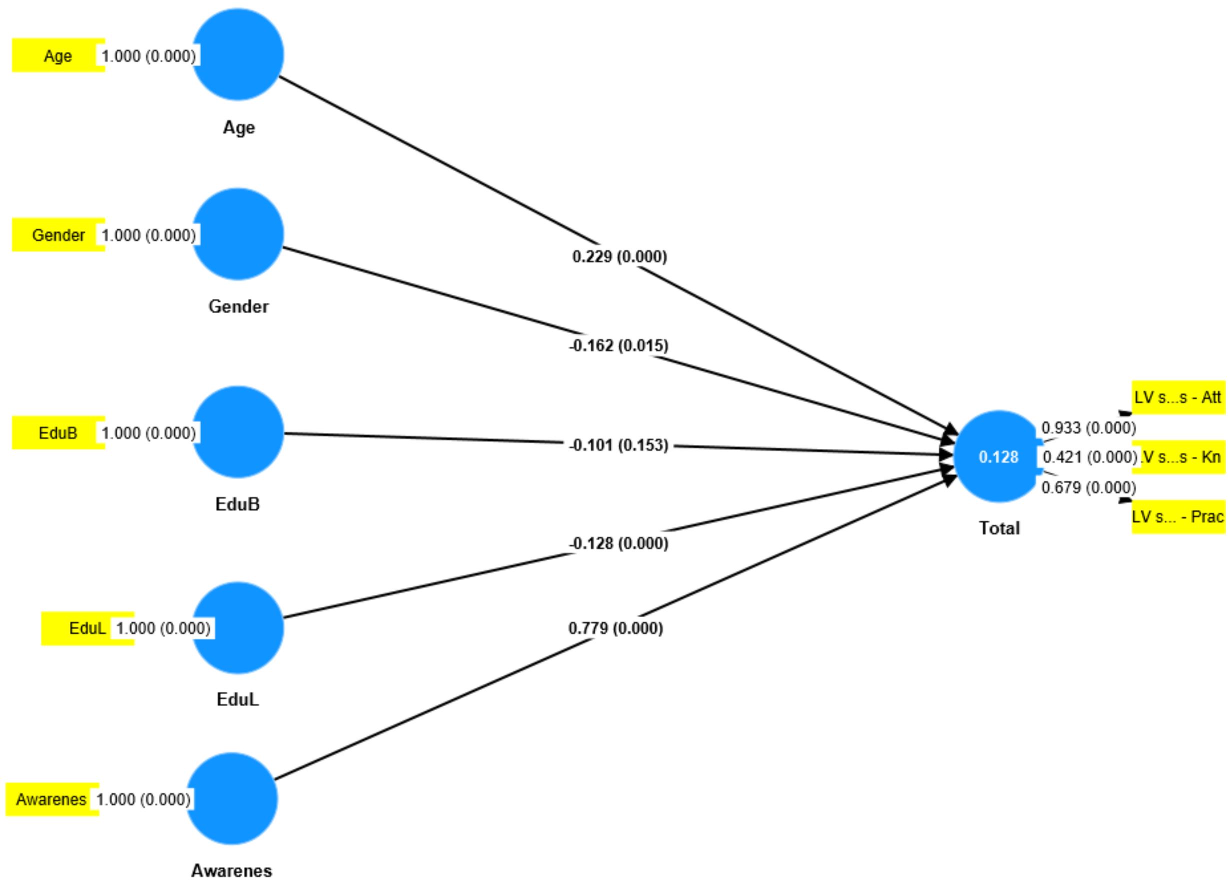

Figure 3 Relationship among knowledge, attitude and practice score