

**PSYCHOSOCIAL FACTORS OF SELF-MEDICATION: A COMPARATIVE
STUDY OF MEDICAL VS. NON-MEDICAL STUDENTS**Jaweria Afzal¹, Dr. Fatima Kamran²^{1,2}Institute of Applied Psychology (IAP), University of the Punjab, Lahore, Pakistan¹jaweriaafzal449@gmail.comDOI: <https://doi.org/10.5281/zenodo.20506248>**Keywords***Self-Medication, Medical Students, Non-medical students, Medicines.***Article History**

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Abstract

A correlation study was conducted to investigate the extent to which psychosocial factors (Self-efficacy, Beliefs about Medicine, Doctor–Patient Relationship, and Health Anxiety) tend to influence the self-medication practice in medical and non-medical students. It also aims to find if these two groups differ in their self-medication behavior and if the doctor-patient relationship acts as a mediator between psychosocial factors and self-medication. A total of 112 students, medical students ($n=47$, $M=20.51$, $SD=1.38$) and non-medical students ($n=65$, $M=21.15$, $SD=2.25$) were recruited from different universities and medical colleges through convenience sampling. A demographic information sheet and general health indicators form were used along with the Self-Medication Scale, Beliefs about Medicines Questionnaire by Horne et al. (1999), General Self-Efficacy Scale by Schwarzer and Jerusalem (1995), Patient-Doctor Relationship Questionnaire by Van der Feltz-Cornelis et al. (2004), and Short Health Anxiety Inventory by Salkovskis et al. (2002) for data collection. The findings of the study revealed that medical students demonstrated greater engagement in self-medication practices, stronger beliefs regarding medication overuse and medication harm, higher self-efficacy, and greater health anxiety compared to non-medical students. Health anxiety demonstrated a significant positive association with self-medication practices, whereas doctor-patient relationship demonstrated a significant negative association with self-medication behavior among both group of students. The findings further revealed that doctor-patient relationship significantly mediated the relationship between psychosocial factors and self-medication practices. Several sociodemographic characteristics and health-related indicators including gender, monthly family income, lifestyle, exercise behavior, and food preferences also demonstrated significant differences across study variables. The results of the present study also reveal that the students' behavior of self-medication is not just based on their medical knowledge and the availability of medicines but also on psychological factors, perceptions of the health service, and health-related concerns. A greater awareness of the importance of social, psychological and interpersonal aspects of healthcare and self-medication behaviors in young adults is further highlighted.

Introduction

Self-medication has become a major public health crisis globally, especially for university students. Students are particularly susceptible to self-medication because they have to juggle the demands of their studies, irregular work hours, financial difficulties, and ready access to medicines (Alomoush et al., 2024). Self-medication is a quick and easy way to treat common health problems, but may cause side effects, overdosing, drug interactions, delayed diagnosis, or failure to detect serious medical conditions.

WHO (2000) defines self-medication as the choice and utilization of medicines for the self-recognized symptoms or illnesses without seeking the advice of a qualified health care professional. Use of a medication that is purchased and used without a prescription, one that has been previously prescribed but is not currently in use, one that has been used by someone before but is no longer needed or one that is recommended by a family member, friend, or an online resource. Responsible self-medication can be useful in the promotion of self-care and may help to relieve pressures on health care services; however, there are many concerns associated with inappropriate use of medication including antimicrobial resistance, drug dependency and delays in treatment (Hughes et al., 2001).

In addition to accessibility and convenience, self-medication behavior is a function of other psychosocial factors. Factors that may influence people's choices to self-diagnose symptoms and take medicines without professional advice include health anxiety, self-efficacy, and beliefs about medicines.

While much research has been conducted on the prevalence and patterns of self-medication, the available studies have tended to concentrate on patterns of medication use (Behzadifar et al., 2020). The psychosocial factors that relate to self-medication behavior among university students

are not as well studied. Health anxiety, self-efficacy and beliefs about medicines may be factors that affect students' decisions to self-medicate but have not been consistently found within populations. Additionally, very few studies have focused on examining these factors and compared medical and non-medical students in Pakistan.

Conceptual Framework

This research is based on Health Belief Model (HBM) and Social Cognitive Theory (SCT) that can explain self-medication behaviors of university students comprehensively. The Health Belief Model suggests that health-related behaviors are affected by a person's thoughts and perceptions about illness, its treatment, and health risks (Rosenstock, 1974). Students' beliefs regarding the necessity, benefits, overuse and possible harmful effects of medicines may shape their attitude toward the use of medicines without professional advice in the process of self-medication. Likewise, health anxiety can heighten attention to bodily symptoms and perceived susceptibility to illness, leading to self-medication practices.

Importance of self-efficacy, observational learning and environment in shaping behavior is highlighted in Social Cognitive Theory (Bandura, 1977). Higher self-efficacy could lead to greater confidence in identifying symptoms, choosing medications, and self-management of health. Self-medication practices by peers, family members and/or educational settings can further perpetuate these behaviors. Medical students have more knowledge and medicines exposure and may have varying beliefs/differential confidence about medicine use than non-medical students.

The present study investigates the relationship of health anxiety, self-efficacy, doctor-patient relationship and the beliefs about medication with the self-medication behavior and explores the differences between medical and non-medical university students on these psychosocial factors.

Conceptual Framework for Psychosocial Factors of Self-medication Behavior

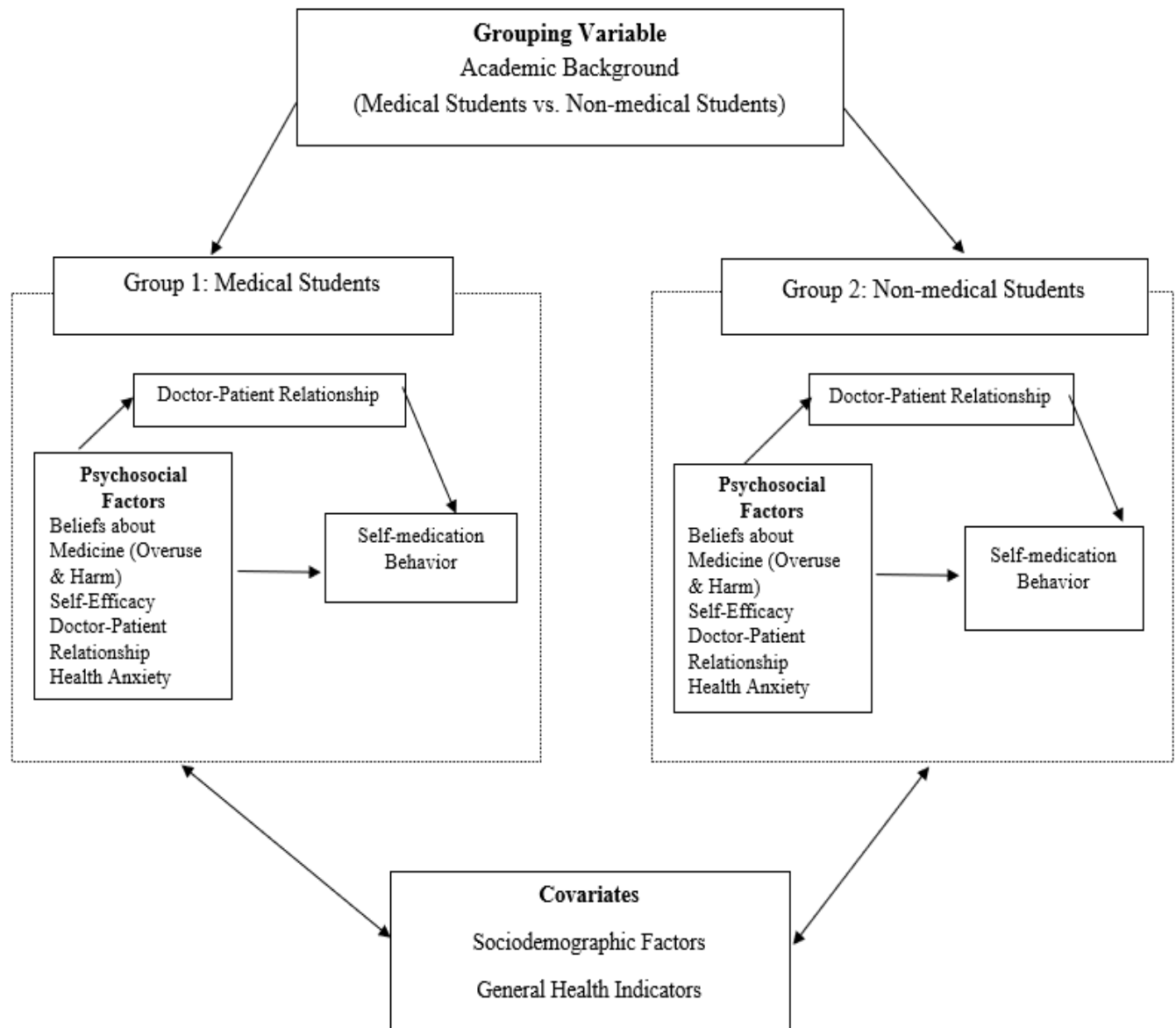


Figure 1

Objectives

The objectives of the study are:

- To investigate the extent to which psychosocial factors (Self-efficacy, Beliefs about Medicine, Doctor-Patient Relationship, and Health Anxiety) tend to influence the self-medication practice in medical and non-medical students.

- To find if these two groups differ in their self-medication behavior
- If the doctor-patient relationship acts as a mediator between psychosocial factors and self-medication.

Hypotheses

- There is likely to be a significant difference in self-medication behavior between medical and non-medical university students.
- Psychosocial factors (self-efficacy, health anxiety, beliefs about medicines, and doctor-patient relationship) are likely to be associated with self-medication behavior among university students.
- Doctor-Patient Relationship is likely to mediate between the psychosocial factors and self-medication.
- Students with diverse sociodemographic characteristics and general health indicators are likely to differ in their practice of self-medication.

Method

Sample and Sampling Strategy

A non-probability quota sampling technique and the convenience sampling strategy was used to collect the data from the participants. Based on G*Power analysis, the estimated sample size was $N = 140$, consisting of 70 medical students and 70 non-medical students. Medical students were recruited from medical colleges whereas non-medical students were from public and private universities based on accessibility and willingness to participate. Data were initially collected from 123 participants, including 53 medical students and 70 non-medical students. After data screening and removal of invalid responses, the final sample consisted of 112 participants, including 47 medical students and 65 non-medical students.

Assessment Measures

The following standardized instruments will be used to measure psychosocial factors associated with self-medication:

Demographic Information Sheet

A self-developed demographic information sheet was used to obtain the personal, familial, educational and occupational details of the participants.

General Health Indicator Sheet

A general health indicators sheet was used to collect the basic health information about

individual's dietary habit, water intake, sleeping schedule, exercising routine, and other basic life style information

General Self-Efficacy Scale (GSE; Schwarzer & Jerusalem, 1995)

The GSE is a 10-item scale measuring individuals' perceived capability to handle difficult situations and cope effectively with challenges. Items are rated on a 4-point Likert scale (1 = Not at all true, 4 = Exactly true). Higher scores indicate greater self-efficacy. The scale has strong internal consistency ($\alpha = .86-.94$).

Beliefs about Medicines Questionnaire (BMQ; Horne et al., 1999)

The BMQ consists of two components: BMQ-Specific (necessity and concerns about medicines prescribed for personal conditions) and BMQ-General (beliefs about overuse and harm of medicines in general). It contains 18 items rated on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree). The questionnaire has good reliability across populations ($\alpha = .70-.87$).

Patient-Doctor Relationship Questionnaire (PDRQ-9; Feltz-Cornelis et al., 2004)

The PDRQ-9 is a 9-item instrument assessing patients' perceived quality of the doctor-patient relationship, including trust, communication, and physician support. Items are rated on a 5-point Likert scale. Higher scores indicate a more positive relationship. The scale demonstrates excellent internal consistency ($\alpha = .94-.97$).

Short Health Anxiety Inventory (HAI-18; Salkovskis et al., 2002)

The HAI-18 measures the severity of health-related anxiety, including worry about illness, misinterpretation of symptoms, and reassurance-seeking. It consists of 18 items with multiple-choice responses scored from 0 to 3. Higher scores reflect greater health anxiety. The scale has strong reliability ($\alpha = .86-.95$).

Self-Medicating Scale (SMS; James & French, 2008)

The Self-Medicating Scale (SMS) is a short scale for evaluating self-medication tendencies. It measures self-medication frequency, self-medication perceived control, dependence on OTC medications and motives for self-treatment. Items on the scale are rated on a Likert-type scale such that higher scores reflect more likely self-medicating behaviors. The SMS has shown good reliability and has been employed in research on the medication habits of young adults ($\alpha = .77$).

Procedure

Before collecting data, the permission was obtained from the university departments. Once approved, students were approached in classrooms, cafeterias, and common areas of the university. A brief explanation of the study and informed consent form were provided to those who met inclusion criteria. Participation was voluntary. After obtaining consent, participants were asked to fill out the demographic form, general health indicator sheet and the five standardized scales. Data was gathered in groups and/or individually as per participant's availability. Students were told that they would be treated confidentially and they could leave the study at any time without penalty.

Results

The aim of the present study was to investigate the psychosocial factors (beliefs about medicines, self-efficacy, doctor-patient relationship, and health anxiety) associated with self-medication in medical and non-medical students. Specifically, the study examined the extent to which these psychosocial factors influence self-medication practice in medical and no-medical students. Internal consistency of all study measures was assessed through Cronbach's alpha reliability coefficients. Descriptive statistics were computed to examine the mean scores and standard deviations of study

variables. Pearson product-moment correlation analysis was conducted to determine the relationships among psychosocial variables and self-medication. Independent sample *t*-tests were used to examine differences between medical and non-medical students on study variables. Multiple linear regression analysis was performed to examine the predictive role of psychosocial factors on self-medication practice. Furthermore, one-way analysis of variance (ANOVA) was conducted to examine differences across different sociodemographic correlates and general health indicators of the participants.

Check for Normality of Distribution

Keeping in view the assumption of normality, all study variables were assessed through skewness and kurtosis values and were found to be approximately normally distributed. Assessment of skewness and kurtosis verified that the assumption of univariate normality was adequately met for further parametric analyses. The Self-Medication Scale (SMS) showed Skewness (-.09) and Kurtosis (-.37), BMQ-G Overuse showed Skewness (.66) and Kurtosis (.23), BMQ-G Harm showed Skewness (.09) and Kurtosis (-.48), General Self-Efficacy Scale (GSE) showed Skewness (-.19) and Kurtosis (-.48), Patient-Doctor Relationship Questionnaire (PDRQ) showed Skewness (.12) and Kurtosis (-.94), whereas Short Health Anxiety Inventory (SHAI) demonstrated Skewness (.47) and Kurtosis (.16). Overall, the values of skewness and kurtosis fell within acceptable ranges, indicating no severe departure from normality and no need for transformation of the data.

Descriptive Statistics and Psychometric Property of the Study Variables

Descriptive statistics and psychometric property of study variables were assessed and the results revealed are presented in the following table:

Table 1
Descriptive Statistics and Psychometric Properties of Study Variables (N=112).

Measure	Medical Students (n=47)						Non-medical Students (n=65)					
	k	M	SD	α	Range		M	SD	α	Range		
					Potential	Actual				Potential	Actual	
SMS	9	32.26	6.25	.81	9-45	16-43	28.51	7.16	.78	9-45	13-45	
BMQ-G (Overuse)	3	3.11	1.02	.75	1-5	1-5	2.37	0.61	.44	1-5	1-4	
BMQ-G (Harm)	5	3.54	0.75	.74	1-5	2-5	2.69	0.69	.70	1-5	1-4	
GSE	10	31.40	5.36	.87	10-40	17-39	28.57	5.84	.86	10-40	14-40	
PDRQ	9	28.09	9.45	.96	9-45	14-45	31.42	9.98	.96	9-45	9-45	
SHAI	18	17.45	6.85	.78	0-54	2-32	14.66	7.36	.81	0-54	2-37	

Note. M=Mean, SD=Standard Deviation, SMS=Self-medicating Scale, BMQ=Beliefs about Medicine Questionnaire, GSE=General Self efficacy Scale, PDRQ=Patient-Doctor Relationship Questionnaire, SHAI=Short Health Anxiety Inventory, k= No. of items, α = Cronbach alpha coefficients

Table 1 shows the descriptive statistics and psychometric properties the study variables among medical and non-medical students. The Self-Medication Scale (SMS), General Self-Efficacy Scale (GSE), Patient-Doctor Relationship Questionnaire (PDRQ), and Short Health Anxiety Inventory (SHAI) demonstrated satisfactory to

high internal consistency reliability ($\alpha = .78$ to $.96$) across both groups. The BMQ-G Harm subscale also demonstrated acceptable reliability ($\alpha = .70$ to $.74$), whereas the BMQ-G Overuse subscale showed comparatively lower reliability among non-medical students ($\alpha = .44$), possibly due to the small number of items.

Pearson Product Correlation between Study Variables and Demographics.

Table 2
Relationships between Demographic and Study Variable in Medical Students (n=47)

Variables	Age	SMS	BMQ Overuse	BMQ Harm	GSE	PDRQ	SHAI
Age	-						
SMS	-.21	-					
BMQ Overuse	.32*	-.00	-				
BMQ Harm	.38**	-.01	.84**	-			
GSE	.15	.06	.47**	.41**	-		
PDRQ	.02	-.75**	-.11	-.16	-.03	-	
SHAI	-.07	.31*	.02	-.05	.32*	-.18	-

Note. M=Mean, SD=Standard Deviation, SMS=Self-medicating Scale, BMQ=Beliefs about Medicine Questionnaire, GSE=General Self efficacy Scale, PDRQ=Patient-Doctor Relationship Questionnaire, SHAI=Short Health Anxiety Inventory. * $p < .5$. ** $p < .01$

Table 2 shows that self-medication is significantly positive association with health anxiety, $r = .31$, p

$< .05$, and a significant negative association with doctor-patient relationship, $r = -.75$, $p < .01$. This

indicates that medical students experiencing greater health-related anxiety were more likely to engage in self-medication behaviors, whereas those reporting more positive doctor-patient relationships demonstrated lower tendencies toward self-medication. Furthermore, beliefs regarding medicine overuse showed significant positive associations with beliefs regarding medicine harm, $r = .84, p < .01$, and self-efficacy, $r = .47, p < .01$, which indicate that medical students who perceived medicines are being overused were also more likely to perceive medicines as harmful. Similarly, beliefs regarding medicine harm were positively associated with self-efficacy, $r = .41, p < .01$. Additionally, self-efficacy demonstrated a

significant positive association with health anxiety, $r = .32, p < .05$, among medical students. This indicates that students with greater confidence in their abilities believe that medicines are harmful and they also experience higher health-related anxiety. Moreover, age demonstrated significant positive associations with beliefs regarding medication overuse, $r = .32, p < .05$, and medication harm, $r = .38, p < .01$, indicating that with increasing age students start believing that medicine are being overused and harmful. No significant associations were observed between age and self-medication practices, self-efficacy, doctor-patient relationship, or health anxiety among medical students.

Table 3
Relationships between Demographic and Study Variable in Non-Medical Students (N=65)

Variables	Age	SMS	BMQ Overuse	BMQ Harm	GSE	PDRQ	SHAI
Age	-						
SMS	.03	-					
BMQ Overuse	-.09	-.00	-				
BMQ Harm	.17	-.01	.84**	-			
GSE	-.06	.06	.47**	.41**	-		
PDRQ	-.08	-.75**	-.11	-.16	-.03	-	
SHAI	.02	.31*	.02	-.05	.32*	-.18	-

Note. M=Mean, SD=Standard Deviation, SMS=Self-medicating Scale, BMQ=Beliefs about Medicine Questionnaire, GSE=General Self efficacy Scale, PDRQ=Patient-Doctor Relationship Questionnaire, SHAI=Short Health Anxiety Inventory. * $p < .5$. ** $p < .01$

Table 3 shows that self-medication demonstrated a significant positive association with health anxiety, $r = .55, p < .01$, and a significant negative association with doctor-patient relationship, $r = -.58, p < .01$. These findings suggest that non-medical students with greater health-related anxiety were more likely to engage in self-medication behaviors, whereas students reporting more positive doctor-patient relationships demonstrated lower self-medication tendencies. Additionally, beliefs regarding medicine overuse demonstrated a significant positive association with beliefs regarding medicine harm, $r = .35, p < .01$. Doctor-patient relationship also

demonstrated a significant negative association with health anxiety, $r = -.32, p < .01$, indicating that students reporting more positive perceptions of doctor-patient relationships experienced comparatively lower health anxiety. These findings collectively suggest that psychological distress and perceptions regarding healthcare relationships play an important role in shaping self-medication behaviors in non-medical students. Moreover, age did not demonstrate significant associations with self-medication practices, beliefs about medicines, self-efficacy, doctor-patient relationship, or health anxiety among non-medical students.

Multiple Linear Regression Analysis for Predicting Self-Medication

Table 4

Psychosocial Factors predicting Self-medication in medical (N=47) and non-medical students (N=65)

Variables	Self-medication			
	Medical Students		Non-medical Students	
	β	p	β	p
BMQ Overuse	.03	.884	-.12	.245
BMQ Harm	-.16	.382	.12	.227
GSE	.05	.698	-.02	.842
PDRQ	-.75	< .001	-.44	< .001
SHAI	.15	.163	.40	< .001
R ²	.61		.50	
F	13.03***		11.77***	

Note. M=Mean, SD=Standard Deviation, SMS=Self-medicating Scale, BMQ=Beliefs about Medicine Questionnaire, GSE=General Self efficacy Scale, PDRQ=Patient-Doctor Relationship Questionnaire, SHAI=Short Health Anxiety Inventory

Table 4 shows that the regression model for medical students was statistically significant, $F(5, 41) = 13.03, p < .001$, explaining 57% of the variance in self-medication scores (Adjusted $R^2 = .57$). Similarly, the regression model for non-medical students was also significant, $F(5, 59) = 11.77, p < .001$, accounting for 46% of the variance in self-medication scores (Adjusted $R^2 = .46$). In medical students, doctor-patient relationship emerged as a significant negative predictor of self-medication, $\beta = -.75, p < .001$, whereas health anxiety, beliefs regarding medicine overuse, beliefs regarding medicine harm, and self-efficacy did not significantly predict self-medication behaviors. While in non-medical students, doctor-patient relationship significantly

negatively predicted self-medication, $\beta = -.44, p < .001$, and health anxiety significantly positively predicted self-medication, $\beta = .40, p < .001$. Beliefs regarding medicine overuse, beliefs regarding medicine harm, and self-efficacy were not found to significantly predict self-medication in non-medical students. These findings collectively indicate that doctor-patient relationship plays an important protective role against self-medication behaviors among both medical and non-medical students, while health anxiety emerged as a significant contributor to self-medication behaviors only in non-medical students, suggesting that greater illness-related worries may increase the likelihood of engaging in self-medication practices in this group.

Mediation Analysis Demonstrating the Role of Mediator

Table 5

Mediation Analysis to demonstrating the role of mediator (Doctor-patient relation) between psychosocial factors and Self-medication (N=112)

Variables	B	SE	β	t	p
Model 1					
Constant	19.15	3.46		5.54	< .001
BMQ-G Overuse	-1.11	0.94	-.14	-1.19	.239
BMQ-G Harm	2.00	0.98	.24	2.05	.043
GSE	0.01	0.11	.01	0.10	.920
SHAI	0.47	0.08	.49	5.88	< .001
Model Statistics					
R	.52				

R ²	.27				
Adjusted R ²	.24				
F	9.74***				
Model 2					
Constant	36.51	3.54		10.32	< .001
BMQ-G Overuse	-0.85	0.75	-.11	-1.14	.258
BMQ-G Harm	1.22	0.79	.14	1.55	.124
GSE	-0.04	0.09	-.03	-0.44	.661
SHAI	0.32	0.07	.33	4.76	< .001
PDRQ	-0.39	0.05	-.55	-7.85	< .001
Model Statistics					
R	.73				
R ²	.54				
Adjusted R ²	.52				
F	24.55***				

Tables 5 shows that in model 1, psychosocial variables including beliefs regarding medication overuse, beliefs regarding medication harm, self-efficacy, and health anxiety significantly explained 26.7% of the variance in self-medication, $F(4,107) = 9.74, p < .001$. Among these variables, beliefs regarding medication harm ($\beta = .24, p < .05$) and health anxiety ($\beta = .49, p < .001$) emerged as significant positive predictors of self-medication. In model 2, doctor-patient relationship was added to the model, resulting in a significant increase in explained variance, $R^2 = .54, F(5,106) = 24.55, p$

$< .001$. Doctor-patient relationship emerged as a significant negative predictor of self-medication ($\beta = -.55, p < .001$). Furthermore, the predictive effect of health anxiety decreased after inclusion of doctor-patient relationship, whereas beliefs regarding medication harm became non-significant. These findings suggest that doctor-patient relationship partially mediated the relationship between health anxiety and self-medication practices and fully mediated the relationship between beliefs regarding medication harm and self-medication practices.

Mean Comparison on Study Variables between Medical and Non-medical Students.

Table 6

Difference between Medical and Non-Medical Students (Education) on Study Variables (N=112)

Variables	Medical Students		Non-medical Students		t	p
	M	SD	M	SD		
SMS	32.26	6.25	28.51	7.16	2.95	.004
BMQ Overuse	3.11	1.02	2.37	0.61	4.41	.001
BMQ Harm	3.54	0.75	2.69	0.69	6.16	.001
GSE	31.40	5.36	28.57	5.84	2.66	.009
PDRQ	28.09	9.45	31.42	9.98	-1.80	.075
SHAI	17.45	6.85	14.66	7.36	2.06	.042

Note. M=Mean, SD=Standard Deviation, SMS=Self-medicating Scale, BMQ=Beliefs about Medicine Questionnaire, GSE=General Self efficacy Scale, PDRQ=Patient-Doctor Relationship Questionnaire, SHAI=Short Health Anxiety Inventory

Table 6 shows significant differences between medical and non-medical students across self-medication practices, beliefs about medicines, self-efficacy, and health anxiety. Medical students reported greater engagement in self-medication practices compared to non-medical students, $t(106.09) = 2.95, p < .01$. They also endorsed stronger beliefs regarding medication overuse, $t(69.75) = 4.41, p < .001$, and medication harm, $t(94.29) = 6.16, p < .001$. In addition, medical students demonstrated higher self-efficacy, $t(103.80) = 2.66, p < .01$, and elevated health

anxiety, $t(103.20) = 2.06, p < .05$, compared to non-medical students. No significant difference was observed in doctor-patient relationship scores between the two groups, $t(102.26) = -1.80, p > .05$. Overall, these findings suggest that medical students exhibit comparatively greater confidence in managing health-related situations, stronger concerns regarding medicines, and increased involvement in self-medication practices, possibly due to their greater exposure to medical knowledge and health-related information.

Table 7
Gender Difference across Study Variables among Medical and Non-medical Students (N=112).

Variable	Medical Students (n=47)		Non-medical students (n=65)					
	Men	Women	t	p	Men	Women	t	p
	M SD)	M(SD)			M (SD)	M(SD)		
SMS	34.43 (5.40)	30.17 (6.39)	2.48	.017*	29.56 (7.12)	27.35 (7.14)	1.25	.218
BMQ-G Overuse	3.22 (1.10)	3.00 (0.95)	0.73	.472	2.43 (0.62)	2.30 (0.61)	0.86	.395
BMQ-G Harm	3.67 (0.77)	3.42 (0.72)	1.17	.250	2.82 (0.74)	2.55 (0.61)	1.61	.112
GSE	31.43 (5.61)	31.38 (5.24)	0.04	.970	30.53 (5.97)	26.42 (4.94)	3.04	.003**
PDRQ	25.39 (8.29)	30.67 (9.93)	-1.98	.054	30.00 (10.11)	32.97 (9.76)	-1.20	.233
SHAI	19.22 (6.31)	15.75 (7.04)	1.78	.082	15.68 (7.62)	13.55 (7.03)	1.17	.246

Note. M=Mean, SD=Standard Deviation, SMS=Self-medicating Scale, BMQ=Beliefs about Medicine Questionnaire, GSE=General Self efficacy Scale, PDRQ=Patient-Doctor Relationship Questionnaire, SHAI=Short Health Anxiety Inventory

Table 7 shows significant gender differences in self-medication practices were observed among medical students, indicating that men reported greater engagement in self-medication practices compared to women, $t(44.32) = 2.48, p < .05$. Among non-medical students, significant gender

differences were found in self-efficacy, suggesting that men reported higher self-efficacy compared to women, $t(62.44) = 3.04, p < .01$. No significant gender differences were observed in beliefs about medicines, doctor-patient relationship, or health anxiety among either group.

Table 8
Monthly Family Income Differences in Study Variables among Medical and Non-medical Students (N=112).

Variable	Medical Students (n=47)		Non-medical students (n=65)					
	≤150,000 PKR	>150,000 PKR			≤150,000 PKR	>150,000 PKR		
	M	M(SD)	t	p	M (SD)	M(SD)	t	p
	SD)							
SMS	29.50 (6.18)	34.68 (5.32)	-3.06	.004**	28.45 (7.28)	28.71 (6.98)	-0.12	.903
BMQ-G Overuse	3.50 (1.15)	2.76 (0.76)	2.57	.014*	2.41 (0.64)	2.24 (0.48)	1.07	.295
BMQ-G Harm	3.83 (0.82)	3.29 (0.58)	2.57	.014*	2.69 (0.65)	2.70 (0.84)	-0.06	.956
GSE	32.55 (5.48)	30.40 (5.16)	1.38	.176	29.02 (5.77)	26.93 (5.98)	1.17	.257
PDRQ	30.77 (9.16)	25.72 (9.24)	1.88	.067	31.98 (9.98)	29.36 (10.05)	0.87	.396
SHAI	14.64 (5.60)	19.92 (6.99)	-2.87	.006**	14.22 (7.98)	16.29 (4.27)	-1.30	.202

Note. M=Mean, SD=Standard Deviation, SMS=Self-medicating Scale, BMQ=Beliefs about Medicine Questionnaire, GSE=General Self efficacy Scale, PDRQ=Patient-Doctor Relationship Questionnaire, SHAI=Short Health Anxiety Inventory

Table 8 shows significant differences in self-medication practices, beliefs about medicines, and health anxiety based on monthly family income among medical students. Students from higher-income families reported greater engagement in self-medication practices and higher levels of health anxiety compared to students from lower-income families, $t(41.79) = -3.06, p < .01$ and $t(44.64) = -2.87, p < .01$, respectively. Conversely, students from lower-income families reported

more negative beliefs regarding medication overuse and harm compared to students from higher-income families, $t(35.50) = 2.57, p < .05$ and $t(36.90) = 2.57, p < .05$, respectively. No significant income-related differences were observed in self-efficacy or doctor-patient relationship among medical students. Additionally, monthly family income did not yield significant differences across study variables among non-medical students.

Table 9
Family System Differences in Study Variables among Medical and Non-medical Students (N=112).

Variable	Medical Students (n=47)		Non-medical students (n=65)					
	Nuclear	Joint			Nuclear	Joint		
	M	M(SD)	t	p	M (SD)	M(SD)	t	p
	SD)							
SMS	32.28 (6.28)	32.23 (6.36)	0.03	.977	27.78 (7.26)	29.46 (7.04)	0.94	.351
BMQ-G Overuse	3.13 (0.91)	3.08 (1.15)	0.19	.852	2.38 (0.52)	2.36 (0.73)	0.13	.896
BMQ-G Harm	3.53 (0.64)	3.55 (0.87)	0.12	.907	2.69 (0.60)	2.69 (0.80)	0.04	.972

GSE	31.24 (5.33)	31.59 (5.52)	0.22	.826	28.59 (5.90)	28.54 (5.87)	0.04	.968
PDRQ	29.24 (9.69)	26.77 (9.22)	0.89	.376	32.46 (9.79)	30.04 (10.23)	0.96	.339
SHAI	18.20 (6.31)	16.59 (7.48)	0.79	.433	14.95 (7.48)	14.29 (7.32)	0.36	.723

In table 9 no significant differences based on family system were observed across self-medication practices, beliefs about medicines, self-efficacy, doctor-patient relationship, or health anxiety in

either group, which suggest that living in a nuclear or joint family system did not substantially influence self-medication practice or the psychosocial variables examined in the study.

Table 11
Exercise Behavior Differences in Study Variables among Medical and Non-medical Students (N=112).

Variable	Medical Students (n=47)		Non-medical students (n=65)					
	Regular	Irregular	t	p	Regular	Irregular	t	p
	M (SD)	M(SD)			M (SD)	M(SD)		
SMS	30.56 (5.89)	33.31 (6.33)	1.50	.141	29.31 (9.96)	28.31 (6.39)	0.35	.735
BMQ-G Overuse	3.74 (0.97)	2.71 (0.85)	3.81	.001**	2.23 (0.42)	2.40 (0.65)	1.18	.248
BMQ-G Harm	3.91 (0.74)	3.31 (0.66)	2.89	.006**	2.54 (0.58)	2.73 (0.71)	1.00	.329
GSE	33.11 (4.36)	30.34 (5.72)	1.75	.087	30.92 (7.37)	27.98 (5.31)	1.36	.195
PDRQ	29.06 (8.82)	27.48 (9.93)	0.55	.585	30.85 (11.63)	31.56 (9.64)	0.20	.841
SHAI	18.89 (5.42)	16.55 (7.55)	1.12	.271	18.23 (9.00)	13.77 (6.70)	1.68	.114

Table 11 shows significant differences in beliefs about medicines based on exercise behavior were observed among medical students. Students who engaged in regular exercise reported stronger beliefs that medicines are being over overuse, $t(45) = 3.81, p < .01$, and harmful, $t(45) = 2.89, p < .01$,

compared to students with irregular exercise behavior. No significant differences were observed in self-medication, self-efficacy, doctor-patient relationship, or health anxiety among medical students. Furthermore, exercise behavior did not yield significant differences across any study variables among non-medical students.

Table 12
Life Style Differences in Study Variables among Medical and Non-medical Students (N=112).

Variable	Medical Students (n=47)		Non-medical students (n=65)					
	Active	Sedentary	t	p	Active	Sedentary	t	p
	M (SD)	M(SD)			M (SD)	M(SD)		
SMS	31.68 (6.05)	33.11 (6.60)	0.75	.457	28.43 (7.58)	28.72 (6.11)	0.16	.871

BMQ-G Overuse	3.37 (1.07)	2.72 (0.82)	2.35	.023*	2.28 (0.63)	2.59 (0.53)	2.00	.054
BMQ-G Harm	3.60 (0.80)	3.45 (0.67)	0.68	.498	2.69 (0.70)	2.69 (0.67)	0.00	.998
GSE	32.64 (5.09)	29.58 (5.36)	1.96	.057	29.30 (6.29)	26.67 (3.97)	2.01	.050
PDRQ	29.50 (9.35)	26.00 (9.46)	1.25	.219	31.09 (9.79)	32.28 (10.70)	0.41	.684
SHAI	19.11 (6.24)	15.00 (7.13)	2.04	.049*	14.89 (7.65)	14.06 (6.73)	0.43	.668

Table 12 shows significant lifestyle-related differences among medical students. Students with an active lifestyle reported stronger beliefs regarding medication overuse, $t(44.28) = 2.35, p < .05$, and higher levels of health anxiety, $t(35.26) = 2.04, p < .05$, compared to students with a

sedentary lifestyle. No significant differences were observed in self-medication practices, beliefs regarding medication harm, self-efficacy, or doctor-patient relationship among medical students. Furthermore, lifestyle did not yield significant differences across study variables among non-medical students.

Table 13
Food Preferences *Differences in Study Variables among Medical and Non-medical Students (N=112).*

Variables	Medical Students (n=47)					Non-Medical Students (n=65)						
	Fast Food	Traditional Food	Healthy Food	Junk/ Snacks	Mixed/Any	F	Fast Food	Traditional Food	Healthy Food	Junk/ Snacks	Mixed/Any	F
	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)		M(SD)	M(SD)	M(SD)	M(SD)	M(SD)	
SMS	30.44 (3.32)	30.82 (4.79)	36.43 (4.86)	35.20 (6.99)	29.60 (7.92)	2.38	38.57 (6.71)	27.20 (6.12)	25.40 (4.93)	25.00 (8.45)	28.17 (6.43)	5.26*
BMQ-G Overuse	4.00 (0.93)	2.88 (1.13)	3.05 (1.15)	2.90 (0.83)	2.80 (0.74)	2.48	1.81 (0.33)	2.60 (0.52)	2.07 (0.72)	2.25 (0.17)	2.38 (0.68)	3.03*
BMQ-G Harm	4.04 (0.68)	3.51 (0.86)	3.54 (0.62)	3.44 (0.69)	3.22 (0.72)	1.62	2.60 (0.82)	2.60 (0.71)	2.16 (0.67)	2.65 (0.50)	2.92 (0.61)	1.65
GSE	33.67 (4.92)	31.18 (6.68)	32.29 (5.62)	30.00 (4.42)	30.40 (5.13)	0.69	26.43 (5.56)	28.72 (5.18)	28.80 (7.53)	30.25 (6.13)	28.71 (6.48)	0.31
PDRQ	29.00 (7.26)	29.64 (7.05)	28.71 (11.79)	22.10 (9.12)	31.10 (11.17)	1.41	22.14 (10.84)	34.48 (8.77)	36.00 (6.71)	31.75 (10.78)	29.92 (9.99)	2.78*

	15.7			20.5								
SHAI	8	14.55	19.86	0	17.40	1.	21.29	14.24	16.00	10.50	8	2.05
	(8.17	(4.18)	(5.37)	(8.5	(6.42)	39	(9.86)	(6.69)	(12.75	(6.86)	(5.12)
)			3))			

Tables 13 shows no significant differences in self-medication practices, beliefs about medicines, self-efficacy, doctor-patient relationship, or health anxiety based on food preferences among medical students. However, among non-medical students, significant differences in self-medication practices, beliefs regarding medication overuse, and doctor-patient relationship were observed across food preference categories, $F(4, 60) = 5.26, p < .01, F(4, 60) = 3.03, p < .05,$ and $F(4, 60) = 2.78, p < .05,$ respectively. Non-medical students preferring fast food demonstrated greater engagement in self-medication practices and comparatively poorer doctor-patient relationship scores than students preferring traditional or healthy foods. These findings suggest that unhealthy food preferences may be associated with greater reliance on self-medication and less favorable healthcare-related perceptions among non-medical students.

Discussion

The present study aimed to explore the phenomenon of self-medication among medical and non-medical students as well as to examine the effects of psychosocial factors like self-efficacy, beliefs about medicines, doctor-patient relationship and health anxiety on self-medication practices. Another goal of the study was to explore the mediating role of doctor-patient relationship between the psychosocial factors and self-medication practices. In addition, the influence of sociodemographic and general health parameters on the self-medication practice was also investigated. The results of the present study revealed that self-medication practice were significantly related to various psychological, interpersonal and health related factors. The findings also emphasized that variations in educational background, beliefs related to medication, health anxiety, and perceptions of health care systems might be factors in the differences in self-medication tendencies among the university students.

The findings of the current study indicated that medical students demonstrated greater engagement in self-medication practices compared to non-medical students. Medical students also reported stronger beliefs regarding medication overuse and medication harm, higher self-efficacy, and greater health anxiety. These findings may suggest that increased exposure to medical knowledge and familiarity with medicines enhance students' confidence in independently managing symptoms and minor illnesses without professional consultation. Greater academic exposure to diseases, medications, and treatment-related information may also contribute to heightened awareness regarding bodily symptoms and health-related concerns among medical students. Previous literature has similarly reported that self-medication practices are comparatively more common among medical students due to greater pharmacological knowledge, easier accessibility to medicines, and confidence in self-diagnosis and treatment decisions (Shabbir et al., 2022; Behzadifar et al., 2020). However, no significant difference was observed between medical and non-medical students regarding doctor-patient relationship, indicating relatively similar perceptions regarding healthcare interactions among both groups.

Furthermore the study indicated that psychosocial factors were significantly associated with self-medication practices among university students. Health anxiety demonstrated a significant positive association with self-medication practices among both medical and non-medical students, indicating that students experiencing greater concerns regarding their health were more likely to rely on self-medication behaviors. These findings may suggest that excessive worry regarding bodily symptoms and illness-related concerns increases the tendency to independently seek medications for symptom relief without professional consultation. Similar findings were reported by Asmundson and Taylor (2020), who

suggested that heightened health-related anxiety often increases reassurance-seeking behaviors, symptom monitoring, and excessive healthcare-related behaviors, including self-medication practices. Furthermore, doctor-patient relationship demonstrated a significant negative association with self-medication practices, indicating that students reporting more positive and satisfactory healthcare interactions were comparatively less likely to engage in self-medication behaviors. Previous literature has also emphasized that effective communication, trust, and satisfaction with healthcare professionals contribute to healthier treatment-related behaviors and reduced reliance on independent medication use (Haskard et al., 2009).

Moreover the results also revealed significant associations between beliefs regarding medicines, self-efficacy, and self-medication practices among university students. Medical students reported comparatively stronger beliefs regarding medication overuse and medication harm than non-medical students. These findings may indicate that increased medical exposure enhances awareness regarding both the benefits and potential risks associated with medication use. Students with greater knowledge regarding pharmacological effects and adverse reactions may become more cautious and critical regarding medicine use, thereby developing stronger perceptions regarding medication overuse and harmful effects of medicines. Previous literature has similarly reported that healthcare and medical students often demonstrate stronger medication-related beliefs due to their increased academic exposure to pharmacology, adverse drug reactions, and irrational drug use practices (James et al., 2006; Kajee et al., 2018).

The findings further demonstrated a strong positive association between beliefs regarding medication overuse and medication harm among both medical and non-medical students, suggesting that students perceiving medicines as excessively prescribed also tended to perceive medicines as harmful. Similar findings have been reported in previous studies suggesting that negative beliefs regarding medicines often coexist and collectively influence medication-related

attitudes and healthcare behaviors (Horne et al., 2013). These medication-related beliefs may influence individuals' decisions regarding independent medicine use, avoidance of professional consultation, and self-management of symptoms.

The current study also revealed that medical students' self-efficacy was higher than that of non-medical students. These results could imply that the process of medical education and repeated learning of healthcare-related information increases confidence in handling symptoms and decisions regarding health without relying on others. Bandura's Social Cognitive Theory (1997) suggests that self-efficacy is a factor that affects people's confidence in their ability to do behaviors and control difficult situations. Self-efficacy is related to the elevated belief in the ability to recognize, choose medicines and self-manage a minor illness without professional advice in the context of self-medication. Previous studies have similarly suggested that individuals with higher health-related confidence and knowledge are more likely to engage in self-care and self-medication practices (Schwarzer & Fuchs, 1996).

Moreover, the current findings indicated that health anxiety was comparatively higher among medical students. These findings may reflect that increased medical exposure and continuous interaction with disease-related information may heighten sensitivity toward bodily symptoms and illness-related concerns. Medical students frequently encounter disease symptoms, diagnostic procedures, and medical complications throughout their academic training, which may contribute to excessive symptom monitoring and increased health-related worries. Previous literature has described this phenomenon as "medical student disease" or "medical students' syndrome," where medical students experience increased concerns regarding personal health after repeated exposure to medical information and disease descriptions (Waterman & Weinman, 2014). Such heightened health concerns may subsequently increase reliance on self-medication practices as a means of symptom management and reassurance.

The findings of the current study further demonstrated that doctor-patient relationship significantly predicted self-medication practices among university students and also acted as a mediator between psychosocial factors and self-medication behavior. Doctor-patient relationship demonstrated a significant negative association with self-medication practices, indicating that students reporting more positive, trusting, and satisfactory healthcare interactions were comparatively less likely to rely on self-medication behaviors. These findings may suggest that individuals who experience effective communication, emotional support, and confidence in healthcare professionals are more likely to seek professional consultation rather than independently managing symptoms through self-medication. Previous literature has similarly emphasized that positive doctor-patient relationship improves treatment-related behaviors, enhances healthcare satisfaction, and promotes adherence to professional medical advice (Street et al., 2009).

The mediation findings of the current study further indicated that doctor-patient relationship partially mediated the relationship between health anxiety and self-medication practices. These findings suggest that students experiencing elevated health-related anxiety may increasingly engage in self-medication partly due to weaker or less satisfactory healthcare interactions. Individuals experiencing excessive concerns regarding illness and bodily symptoms may seek reassurance through repeated medication use when they perceive limited emotional support, inadequate communication, or dissatisfaction within healthcare interactions. Previous studies have similarly reported that patients experiencing poor healthcare communication and lower trust in healthcare professionals are more likely to engage in independent health-management behaviors, including inappropriate medication use and self-treatment practices (Street et al., 2009).

Furthermore, doctor-patient relationship fully mediated the relationship between beliefs regarding medication harm and self-medication practices. These findings indicate that medication-related beliefs may influence self-medication

tendencies through individuals' perceptions and experiences regarding healthcare interactions. Students holding stronger beliefs regarding harmful effects of medicines may become more cautious regarding professional treatment recommendations and may increasingly rely on self-directed medication decisions when healthcare relationships are perceived as less supportive or satisfactory. Previous literature has similarly suggested that trust, communication quality, and patient satisfaction strongly influence medication-related attitudes and treatment-related behaviors (Fuertes et al., 2007). The results of the present study consequently underscore the important contribution of interpersonal healthcare experiences to the decision-making about medication use among university students.

The results of the current study also showed that a number of sociodemographic factors and overall health status significantly affected self-medication practices and psychosocial factors among university students. The results showed that medical students' male participants were more involved in self-medication practices than their female counterparts. These results might imply a higher comparative likelihood to self-manage symptoms and make decisions regarding medication use without professional advice among men. The findings are consistent with previous research that men have been found to be less likely to seek care for health problems and be more likely to undertake self-care practices than women (Albusalih et al., 2017). Men, however, among those who were not medical students, showed higher scores of self-efficacy than women, with comparatively higher self-efficacy in the ability to handle difficult situations and health-related issues on their own.

The monthly income of the family showed significant correlations with self-medication and medication beliefs of the medical students. Students of lower income families endorsed comparatively stronger beliefs regarding medication overuse and medication harm, while students of higher income families endorsed higher health anxiety, higher engagement with self-medication practices. The results could suggest that more financial availability leads to more

opportunities to obtain medicines without a professional consultation and thus to more reliance on self-medication practices. However, students from low-income families can have more negative attitudes towards medicines because they worry about the cost of care, side effects, and using medicines inappropriately. A similar finding has been reported in the literature, whereby socioeconomic status is also linked to health care utilization, access to medications, and beliefs regarding treatment (Abay & Amelo, 2010).

The current results also showed positive relationships between age and beliefs about medication overuse and medication harm in medical students. The results could indicate that more education exposure and more clinical awareness lead to more caution when taking medicines and more sensitivity to medicines' risks. Past research has also found that greater exposure to medical knowledge and health care experiences might enhance individuals' awareness about irrational medicine use, side effects, and overprescribing (Montastruc et al., 2021).

Exercise behavior and lifestyle patterns were also among variables with meaningful relationships to the psychosocial variables among medical students. A relationship between regular exercise/active lifestyle and comparatively stronger beliefs about medication overuse and increased health anxiety was reported by students. These results might seem surprising at first glance, but can be interpreted as a sign of a greater awareness of health and a higher level of sensitivity towards the body's signs and symptoms among health-conscious people. Students who play an active role in their own physical health may be more aware of the risks of taking medications and more attuned to health related issues. Other studies have also indicated that people who are more health conscious tend to have more symptom monitoring and more positive attitudes about health behaviors and use of medicine (Conner & Norman, 2017). Non-medical students also showed some preference for food that would impact on their self-medication and perception of health care. Students preferring fast food demonstrated greater engagement in self-medication practices and comparatively poorer doctor-patient relationship

scores than students preferring traditional or healthy foods. These findings may suggest that unhealthy dietary patterns coexist with poorer health-related behaviors, reduced healthcare engagement, and increased reliance on independent symptom management. Previous studies have similarly linked unhealthy lifestyle patterns with poorer health behaviors and reduced utilization of professional healthcare services (Liu et al., 2017). However, family system did not produce significant differences in self-medication practices or psychosocial variables among either medical or non-medical students, indicating that living in nuclear or joint family systems may not substantially influence medication-related behaviors among university students.

Limitations of the Study

- There is a possibility of social desirability bias, which can influence how participants respond to questions.
- Since it was a cross-sectional study which examine a population at a single point in time, therefore it cannot establish the direction or timing of relationships, making it difficult to determine which variable influences the other.

Implications of the study

- The findings of the present study may help psychologists, healthcare professionals, and university administrations better understand the psychological and interpersonal factors associated with self-medication practices among university students. Understanding the role of health anxiety, medication-related beliefs, and doctor-patient relationship may contribute to more informed approaches toward addressing inappropriate self-medication behaviors among young adults.
- The present study also provides empirical evidence regarding the role of doctor-patient relationship in self-medication practices within the Pakistani context. The findings may contribute to future research exploring psychosocial and healthcare-related factors influencing medication behaviors and may encourage greater attention toward interpersonal healthcare experiences while understanding self-medication practices among university students.

