Beliefs, attitudes and self-use of Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy medicines among senior pharmacy students: An exploratory insight from Andhra Pradesh, India

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ABSTRACT

Objectives: To assess the beliefs, attitudes and self-use of Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy (AYUSH) medicines among senior pharmacy students. **Methodology:** This was a descriptive cross-sectional study conducted among pharmacy students in four pharmacy schools located in Andhra Pradesh in South India. This study was conducted from the August to September 2014. The study population included all pharmacy students enrolled in Doctor of Pharmacy, Bachelor of Pharmacy and Diploma in Pharmacy programs in studied pharmacy schools. The pretested AYUSH survey had 8 questions on AYUSH related beliefs and 8 question on AYUSH related attitudes. The survey also asked participants about AYUSH related knowledge, frequency of use of AYUSH and the reason for using AYUSH. The data analysis was performed using SPSS Version 20. Chi-square test and Mann–Whitney U-test were employed to study the association between the independent and dependent variables. **Results:** A total of 428 pharmacy students participated in the survey. 32.2% of the study population was females and 32.5% of the population resided in rural areas. Males were more likely to have positive beliefs about AYUSH when compared to females (odd ratio [OR] = 4.62, confidence interval [CI] = 2.37–8.99, $P < 0.001$). Similarly, students living in hostels were more positive in their beliefs about AYUSH compared with students living at home (OR = 2.14, CI = 1.12–4.07, $P < 0.05$). Students living in hostel also had a positive attitude about AYUSH use (OR = 1.74, CI = 1.03–2.93, $P < 0.05$). **Conclusion:** Pharmacy students held favorable attitude and beliefs about AYUSH use. This baseline survey provides important information about the pharmacy student's perception about AYUSH. Further research is needed to explore the reasons that shape the pharmacy student's beliefs and attitudes about AYUSH.

Key words: Attitude, Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy, beliefs, India, pharmacy students

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INTRODUCTION

Complementary and alternative medicine (CAM) is defined as a term used to describe practices, treatments, or therapies that are not part of standard medical care. Complementary medicines are used in conjunction with standard care. Alternative medicines are used in replacement of standard care.[1] The Department of Indian Systems of Medicine and Homeopathy was created in 1995 and in 2003 was renamed to Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy (AYUSH). AYUSH stands for Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy.[2] This department focuses on providing education and research in AYUSH. Ayurveda is a therapeutic approach, which views life as the union of the body, senses, mind, and soul. Yoga is used as a means to attain complete self-realization and as a tool to develop one's innate powers in a balanced

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form. Naturopathy is defined as a system, which recognizes the existence of curative forces within the body.[2] The principle of Unani is that each individual is viewed as a separate entity, and each factor that makes up an individual is taken into account. The basic theory of Unani is based upon the four humor theory of Hippocrates that the body has four humors (blood, phlegm, yellow and black bile). The principles of Siddha are similar to Ayurveda in which the human body is seen as a replica of the universe and that the human body is composed of five elements (earth, water, fire, air, and sky). Homeopathy is based on the theory that "likes are cured by likes." Homeopathy treats diseases using the substance that causes the symptoms of a disease in healthy individuals to cure similar symptoms in sick people.[2]

Although there is a global rise in the use of CAM, most people are still not well aware of what they are. A recent study done in the Kuwaiti population showed that most of the participants surveyed were between not at all familiar and somewhat familiar.[3] Respondents showed high interest in getting more information on natural health products (all categories were >90%). The study also showed that the most common sources for recommending and providing information regarding the use of NHPs were family members, friends, and mass media. The least common sources for recommending information were pharmacists (8.7%) and medical doctors (7.8%). Another study done in Pakistan with medical students showed that their main source of CAM knowledge was from newspapers and magazines. Over two-thirds of the respondents said that they understood the basic principles of four out of the ten modalities that they were surveyed in[4] likewise, a study of a 100 resident doctors in India showed that the allopathic residents had little knowledge about basic concepts of Ayurveda, but more than half of the residents prescribed Ayurvedic medicines to patients.[5]

Even with the steep increase in the consumer use of CAM products, many schools of medicine, nursing, and pharmacy have not revised their curriculum to account for this change.[6] A study at the Minnesota College of Pharmacy was done to perceive the attitudes of the pharmacy faculty and students toward CAM products. The results showed that overall the attitudes of the faculty members and students were positive. The majority of faculty members and students indicated that CAM should be included in the school curriculum and that health professionals should be able to advise their patients about CAM methods.[6] Another study done with New Zealand pharmacy students at the University of Otago demonstrated the changes in use and beliefs of traditional medicine from the pharmacy students 2nd year to their final year. The results showed that the use of traditional healthcare rose from 48% in their 2nd year to 61% in their final year. Students primarily used traditional healthcare from their own culture and about two-thirds of them considered it as sometimes useful for the prevention and treatment of illness.[7]

The curriculum followed in Indian pharmacy schools has hardly undergone any significant changes since the existence of AYUSH system of medicines. At the same time, the number of AYUSH practitioner is significantly increasing at an annual rate of 2.5%, with the maximum rise of 11.8% was observed in 2000.[8] Ayurveda education, an important component of AYUSH, at pharmacy level came into limelight after the establishment of Institute of Ayurvedic Pharmaceutical Sciences at Gujrat Ayurvedic University. National Institute of Pharmaceutical Education and Research has also initiated Master's program in traditional medicines due to the persistent demand of the industry. With the growing industry of these traditional medicines, the role of pharmacists is also becoming very prominent, as the appointment of the pharmacist is now considered mandatory for Ayurvedic manufacturers.[9] In view of this, the study was conducted to evaluate the beliefs, attitude and self-use of AYUSH among pharmacy students in India.

METHODOLOGY

A cross-sectional study was conducted among pharmacy students of four pharmacy schools in the state of Andhra Pradesh in South India. The study was conducted for the period of 2 months in August and September 2014.

All the studied pharmacy schools offered Bachelor of Pharmacy (B.Pharm), Doctor of Pharmacy (Pharm.D) and Diploma in Pharmacy (D.Pharm). All the pharmacy schools were approved by the pharmacy council of India (PCI), All India council of technical education and by the Andhra Pradesh government. For each pharmacy school, PCI has approved maximum 60 seats for B.Pharm, D.Pharma and 30 seats for regular Pharm.D intake. The list of all the enrolled students was taken from the lecturers.[10]

A self-administered questionnaire was used a tool to collect the data from the pharmacy students. The questionnaire was distributed to the students by one of the author responsible for data collection. The same author was also assigned the responsibility of providing an explanation to students regarding the questionnaire. An initial draft has been designed by the authors after an extensive literature review,[5-7,11,12,13] after which it was sent to 4 experts from pharmacy faculties for content validity. The expert opinion was given in view of making the questionnaire more simple, relevant and important. The questionnaire was then face

validated through a pilot study, which was conducted by taking a small sample size of pharmacy students ($n = 15$). Five students from each pharmacy program were taken for consideration of the pilot study. After getting feedback from the students, necessary changes were made to the questionnaire with the aim of making it more brief and simple. The reliability coefficient was found to be 0.77. The responses from these participants were not included in final analysis.

The finalized questionnaire was divided into four sections. The first section included demographic information such as gender, course of studying, religion, living status and their age. The second section included eight questions that measured their beliefs of pharmacy students about AYUSH medications. The responses of these questions were measured on 3 point likert scale of agreement. Belief was assessed by giving 1 to agree, 2 to unsure, 3 to disagree. Score of <2 were taken as positive belief while ≥2 as negative belief.

The third section assessed the attitude of pharmacy students towards AYUSH medications use. This section included eight questions, responses of which were measured on a 3 point likert scale of agreement. Attitude was assessed by giving 1 to agree, 2 to unsure, 3 to disagree. Score of <2 was taken as positive attitude while ≥2 as a negative attitude. The fourth last part section of this evaluation highlighted participants' self-use of AYUSH medications, knowledge about AYUSH medications, how often they use, reason for use, disease conditions for that they used AYUSH drugs, type of systems used by students and names of the commonly used drugs.

Permission was taken from the concerned principal of the schools, lectures and preceptors of the studied pharmacy colleges. Students were comprehensively explained about the objectives of this study before requesting them for their voluntary participation in this study. Participants were also explained that completion and submission of the questionnaire would be taken as consent to participate in this study. Data were dealt with the high level of anonymity and confidentiality.

Statistical analysis of data was carried out on SPSS version for Windows (IBM Corporation, Armonk, New York). Descriptive analysis was applied to express the results in frequency and percentages. Mean and standard deviation was also computed for the study variables. Chi-square test was applied to find the association between dependent and independent variables. However, if 25% or more cells in table have an expected frequency of <5, Fisher's Exact test was preferred over Chi-square test. Monte Carlo test (two-sided) with 99% confidence level was also used to estimate the fisher exact *P* value, which was considered as significant at $P < 0.05$. Logistic regression test was employed to examine the association between beliefs and attitudes (dependent variables) with a demographic (independent) variable.

RESULTS

The results showed that the mean age of the participants was 21.54 years. Almost one-third of the respondents were female (32.2%) and resided in rural areas (32.5%). The representation of participants from B.Pharm, Pharm.D and D.Pharm courses were 45.6, 36.4 and 18% respectively. A large number of students were a follower of Hindu religion (85.7%), followed by Islam (10.3%) and other religions (4%) as shown in Table 1.

Overall, the participants' belief about AYUSH medicines was positive (1.56 ± 0.39). The complete description of participants' responses to belief questions is presented in Table 2. Gender and living status appeared as significant variables associated with the belief of the respondents. Male participants were 100% more likely to hold positive beliefs about AYUSH as compared to their female counterparts (odd ratio [OR] = 4.62, confidence interval [CI] = 2.37–8.99, $P < 0.001$). Similarly, the beliefs of students living in hostel were significantly positive in comparison to those living with their family (OR = 2.14, CI = 1.12–4.07, $P < 0.05$). It was also noted that rural population had a positive beliefs about AYUSH medicines, however this association was not statistically significant (OR = 1.47, CI = 0.71–3.02, $P > 0.05$). Muslim students even though, were more positive in their beliefs compared to Hindu students, the data were not supported by statistical significance (OR = 1.59, CI = 0.56–4.5, $P > 0.05$). The association of participants' beliefs with demographic variables in tabularized in Table 3.

Table 1: Demographic information of participants

Demographic variables	*n* (%)
Mean age (in years)	21.54±2.36
Gender	
Male	290 (67.8)
Female	138 (32.2)
Residence	
Rural	139 (32.5)
Urban	289 (67.5)
Course	
B.Pharm	195 (45.6)
Pharm.D	156 (36.4)
D.Pharm	77 (18)
Living status	
Hostler/outsider	302 (70.6)
Family home	126 (29.4)
Religion	
Hindu	367 (85.7)
Muslim	44 (10.3)
Other	17 (4)

Furthermore, participants' attitude toward AYUSH medicines was also positive (1.69 ± 0.38) [Table 4]. Students' responses to various attitude questions are summarized in Table 4. Living status was the only variable that appeared as a significant predictor of the attitude towards AYUSH medicines. Students living in the hostel were 74% more likely to have a positive attitude when compared to students living at home (OR = 1.74, CI = 1.03–2.93, $P < 0.05$). Male participants also had more positive attitude towards AYUSH medicines compared to females. However, this association was not statistically significant (OR = 1.5, CI = 0.9–2.51, $P > 0.05$). Association of participants' attitude with demographic variables is presented in Table 5.

Regarding the self-use of AYUSH medicines, a slightly less than a quarter of the total sample revealed that

Table 2: Participants belief towards AYUSH medicines

Questions	*n* (%)		
	Agree	Unsure	Disagree
I believe that AYUSH is more effective than allopathic medicine	250 (58.4)	60 (14)	118 (27.6)
I believe that AYUSH is safer than allopathic medicine	284 (66.4)	66 (15.4)	78 (18.2)
I believe that AYUSH is less expensive than allopathic medicine	249 (58.2)	70 (16.4)	109 (25.5)
I believe that AYUSH is a natural product	307 (71.7)	62 (14.5)	59 (13.8)
I believe that AYUSH has less side effects compared to allopathic medicine	273 (63.8)	64 (15)	91 (21.3)
I believe that AYUSH is good to maintain my overall health and wellbeing	314 (73.4)	68 (15.9)	46 (10.7)
I believe that AYUSH is better than allopathic medicine to maintain overall health	250 (58.4)	88 (20.6)	90 (21)
I believe that AYUSH provides permanent cure for some disease	176 (41.1)	134 (31.3)	118 (27.6)

Belief was assessed by giving 1 to agree, 2 to unsure, 3 to disagree. Score of <2 were taken as positive belief while ≥2 as negative belief. Mean belief score was 1.56±0.39. AYUSH=Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy

Table 3: Association of participants' belief with demographic variables

Variables	Participants' belief (%)		OR (95% CI)	*P*
	Positive	Negative		
Gender				
Male	271 (93.4)	19 (6.6)	4.62 (2.37-8.99)	<0.001
Female	96 (69.6)	42 (30.4)	Reference	
Residence				
Rural	127 (91.4)	12 (8.6)	1.47 (0.71-3.02)	NS
Urban	240 (83)	49 (17)	Reference	
Course				
B.Pharm	166 (85.1)	29 (14.9)	Reference	NS
Pharm.D	130 (83.3)	26 (16.7)	0.92 (0.48-1.77)	
D.Pharm	71 (92.2)	6 (7.8)	0.88 (0.30-2.57)	
Living status				
Hostel	276 (91.4)	26 (8.6)	2.14 (1.12-4.07)	0.021
Family home	91 (72.2)	35 (27.8)	Reference	
Religion				
Hindu	315 (85.8)	52 (14.2)	Reference	NS
Muslim	39 (88.6)	5 (11.4)	1.59 (0.56-4.5)	
Other	13 (76.5)	4 (23.5)	1.11 (0.32-3.87)	

Overall predictive accuracy is 85.7%. Omnibus tests of model coefficients: χ^2=50.126, P<0.05. −2 log likelihood=300.421, Nagelkerke R^2=0.198; Hosmer and Lameshow test: χ^2=16.004, P>0.05. OR=Odds ratio; CI=Confidence interval; NS=Not significant

Table 4: Participants attitude toward AYUSH medicines

Questions	*n* (%)		
	Agree	Unsure	Disagree
I use AYUSH because allopathic medicine is less effective	195 (45.6)	55 (12.9)	178 (41.6)
I use AYUSH because allopathic medicine is less safe	211 (49.3)	63 (14.7)	154 (36)
I use AYUSH because allopathic medicine is more expensive	200 (46.7)	96 (22.4)	132 (30.8)
I use AYUSH because they are more natural compared to allopathic medicine	303 (70.8)	47 (11)	78 (18.2)
I use AYUSH because I have more faith in AYUSH	192 (44.9)	124 (29)	112 (26.2)
I use only AYUSH to maintain my health and wellbeing	192 (44.9)	104 (24.3)	132 (30.8)
I use AYUSH with allopathic medicine to maintain my health and wellbeing	194 (45.3)	91 (21.3)	143 (33.4)
I use AYUSH to restore the body's own balance	226 (52.8)	88 (20.6)	114 (26.6)

Attitude was assessed by giving 1 to agree, 2 to unsure, 3 to disagree. Score of <2 were taken as positive attitude while ≥2 as negative attitude. Mean attitude score was 1.69±0.38. AYUSH=Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy

they frequently used AYUSH (23.4%). 60.5% students reported that they rarely or never used AYUSH medicines. The majority of participants reported that the major reason of using AYUSH medicines was that they were well knowledgeable about the AYUSH medicines used for various diseases. Interestingly, pharmacy students' main source of knowledge were family, friends or neighbors (40.7%), followed by internet (19.4%). Ayurvedic (42.5%) and Homeopathic drugs (35.3%) were the choice of medicines preferred by pharmacy students. Gender, age, and religion were the common variables significantly associated with the self-use of AYUSH medicines ($P < 0.05$). The breakdown of participants' responses to various self-medication practices of AYUSH medicines is summarized in Table 6.

DISCUSSION

To the best of our knowledge, this is the first study conducted in India that examines the knowledge, attitude and beliefs toward AYUSH system of medicines among final year pharmacy students. In this study, a total of 428 pharmacy students participated after giving their consent giving a response rate of 59.44%. This response rate is somewhat below than the study conducted in Malaysia (64%)[11] and other study from Pakistan (90%).[4] This study showed that male students had a significantly positive belief towards AYUSH use compared to female students. These results were not in accordance to other studies conducted in Australia[14] and USA.[15] These results also contradict the findings of another study in which male participants considered AYUSH to be a threat to public health and believed that AYUSH could harm patients.[16] Further studies are required to establish these results, and effective interventions must be designed to improve the understanding of AYUSH medicines in India. Similarly, students staying in a hostel, showed positive belief towards AYUSH medicines in comparison to their respective group. Dissatisfaction with the traditional medicine, affordability issues with conventional medicines and social influences could be the possible reasons of this finding. Efforts must be made to educate pharmacy students about the use of AYUSH as they have an important role to play in the healthcare setting of India. It is also of interest to mention that Muslims were more likely to have a positive belief about AYUSH medicines as compared to Hindu fellows, although the difference was not reported as significant. Literature, however, shows that Hindu religion is more inclined Ayurvedic medicines while Muslims usually follow Unani medicines.[17] There is a need to explore the possible factors influencing the choice of traditional medicines with regards to religious and ethnical identities.

Although pharmacy students' attitude towards AYUSH medicines was positive, our study exemplifies the need to implement an herbal or alternative medicine class into the curriculum of pharmacy schools, since many students are not completely aware of the use of alternative and complementary medicines. AYUSH products are not standardized, and the quality and quantity of some of the ingredients or the main ingredient might not be known.[18] In this study, a remarkable number of students agreed that AYSUH medicines are natural and free of any side-effects. Similarly, a large cohort of students agreed that AYUSH should be used along with allopathic medicines to maintain well-being. Studies have, however, reported that lack of

Table 5: Association of participants' attitude with demographic variables

Variables	Participants' attitude (%)		OR (95% CI)	*P*
	Positive	Negative		
Gender				
Male	228 (78.6)	62 (21.4)	1.50 (0.9-2.51)	NS
Female	90 (65.2)	48 (34.8)	Reference	
Residence				
Rural	104 (74.8)	35 (25.2)	0.865	NS
Urban	214 (74)	75 (26)	Reference	
Course				
B.Pharm	147 (75.4)	48 (24.6)	Reference	NS
Pharm.D	109 (69.9)	47 (30.1)	0.77 (0.47-1.28)	
D.Pharm	62 (80.5)	15 (19.5)	0.97 (0.46-2.04)	
Living status				
Hostel	238 (78.8)	64 (21.2)	1.74 (1.03-2.93)	0.037
Family home	80 (63.5)	46 (36.5)	Reference	
Religion				
Hindu	279 (76)	88 (24)	Reference	NS
Muslim	29 (65.9)	15 (34.1)	0.68 (0.34-1.36)	
Other	10 (58.8)	7 (41.2)	0.58 (0.2-1.63)	

Overall predictive accuracy is 74.1%. Omnibus tests of model coefficients: χ^2=17.357, P<0.05. −2 log likelihood=300.421, Nagelkerke R^2=0.058; Hosmer and Lameshow test: χ^2=10.637, P>0.05. OR=Odds ratio; CI=Confidence interval; NS=Not significant

Table 6: Participants' self-use of AYUSH medicines

Self-medication data	Categories	Percentage	P[a]					
			Gender	Residence	Course	Status	Age	Religion
How often you take AYUSH self-medication	Frequently	23.4	0.001	0.967	0.402	0.001	0.001	0.014
	Weekly	16.1						
	Rarely	38.8						
	Never	21.7						
Reason	Disease is simple	13.1	0.001	0.078	0.010	0.388	0.005	0.015
	Treatment cost is high in clinics	15.9						
	There was a previous experience with the disease	20.3						
	Knowledge about the drug and disease	31.3						
	Lack of hospitals in the nearest place	7.5						
	Lack of trust in allopathic medical service	7.5						
	Self-decision	4.4						
Source of knowledge	Medical news letters and others	8.9	0.001	0.126	0.068	0.103	0.001	0.001
	Family, friends or neighbors	40.7						
	Pharmacist (retail pharmacy shops)	7						
	Prescribed by physician	6.1						
	Internet	19.4						
	Text books	9.1						
	Others	8.9						
Disease conditions	Cough/cold/flu and other respiratory problems	20.6	0.001	0.061	0.001	0.001	0.001	0.039
	Fever and other milder illness	10.7						
	For prophylaxis	6.3						
	Nutritional supplements	26.9						
	Diarrhea and other GIT related problems	6.3						
	Stress and tension	4.2						
	Acne and pimples	10.7						
	Others	14.3						
Preference of use	Ayurvedic	42.5	0.001	0.903	0.017	0.001	0.001	0.001
	Unani	13.8						
	Homeopathy	35.3						
	Others	8.4						

[a]Derived from Chi-square test. AYUSH=Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy; GIT=Gastrointestinal tract

communication between physician and patients about the traditional drugs could lead to disastrous consequences.[19] Pharmacy students should be provided in depth information about such issues to prepare them to face the future challenges of life in order to improve public health.

The source of knowledge about AYUSH among the study participants came mostly from family, friends, or neighbors. Furthermore if we looked course wise the difference should be significant in their knowledge because during the study of B.Pharm, they study 2–3 years (4–6 semesters) related to course pharmacognosy (herbal drugs) and in Pharm.D and D.Pharm just only 1-year, so for that we expect that B.Pharm students have good knowledge compared with others. When a similar study was conducted among pharmacy faculty and students at the University of Minnesota showed that majority of the study participants sought information about AYUSH from professional journals, peer professionals, other healthcare professionals and mass media.[6] In India, knowledge about AYUSH has been passed through generations in spite of the availability of formal texts. In western countries, information about AYUSH has been acquired through AYUSH practices in eastern countries.

A study by Harris *et al.* (2006) showed that a small number of faculty and students had knowledge about AYUSH due to unavailability of resources and training about CAM. Another study conducted in Sierra Leone found that some of the barriers to AYUSH practice were a lack of trained AYUSH professionals and lack of scientific evidence for the practice of AYUSH.[20] If the faculty is given training about AYUSH, it is possible that they would be more likely to impart the knowledge to their students. However, personal beliefs about AYUSH held by faculty may also play an important role in incorporating AYUSH into the pharmacy curriculum.[6] This study included the perspective of students receiving training for different degrees in pharmacy (B.Pharm, Pharm.D, and D.Pharm), which accounted for variability in the thinking of subjects. The participant's attitudes were assessed per each degree. Among all the participants enrolled in the three degrees, the majority of participants were in concordance with the belief that AYUSH is of importance.

This study could only capture baseline information about the beliefs, attitudes and practices of pharmacy students. Conducting follow-up interviews and focus groups can provide additional insight into the reasons that shape the beliefs and attitudes of pharmacy students about AYUSH.

CONCLUSION

The overall attitude and beliefs held by pharmacy students about AYUSH were positive. In spite of barriers in introducing AYUSH into the pharmacy curriculum, there is a high likelihood that the pharmacy students will incorporate AYUSH in their practice in the future. Furthermore, as a patient-centered care gains priority, AYUSH based therapy can become an integral part of the holistic treatment of patients. Stakeholders and other concerned officials should consider the revision in pharmacy curriculum with respect to AYUSH in view of the need of the society.

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