The prevalence of depression and its perceptions among undergraduate pharmacy students

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Abstract

Introduction: Depression is mental health disorder which not only influences the overall health of the individual but affects the social aspects too. The pharmacy curriculum teaches the students about the disease and its management. The study focuses the prevalence of depression and its perceptions.

Methods: A quantitative cross sectional study was conducted in pharmacy institutes of Pakistan targeting the undergraduates with a structured questionnaire.

Results: The prevalence of depression in the male and female students was 59.49% (51.40% to 67.22% for 95% CI) and 64% (58.91% to 68.86% for 95% CI) respectively, majority never visited any institute dedicated for such individuals, major segment of target group expressed their unwillingness to live with such people, the bulk of students believed the depressed individuals are a threat to the society.

Conclusion: The pharmacy education did not help lowering the social stigmatisation of undergraduates regarding depression however improved their optimism regarding its treatment.

Keywords: *Prevalence, depression, mental health disorders, pharmacy, students.*

Introduction

Depression is disease characterised by the recurrent episodes of altered mental states which is responsible for not only the medical complications but associated social issues (Khan *et al*,. 2014; Medscape, 2014). The condition not only occurs alone but sometimes presents as co morbidity or consequence of an underline cause. It may sometimes present itself as a triage of two major illnesses (Khan *et al*,. 2014). In any case, depression needs to be treated aggressively as it can aggravate and exacerbate the other associated illnesses and, at the same time increase the associated social stigma concerning the affected individuals and the care givers (Bell *et al*., 2006). Recently, the American Heart Association AHA panel listed depression as the risk factor for cardiovascular complication (Brauser, 2014).

Thus, the treatment of depression becomes very important and the goals of pharmacotherapy for alleviating the said condition are not only focused at pharmacological interventions but psychological and educational interventions which form the core treatment plan (National institute of health and clinical excellence, 2009). Patient education goes side by side in the management of the aforesaid condition. One of the goals of management of depression apart from the pharmacological treatment is to educate the patient about the disease. The role of a disease educator cannot be neglected and hence a pharmacist is recognised as a key player in such circumstances the world over. It is so because they have been taught about disease and its pharmacotherapy in their pharmacy curriculum. However studies have reported that the pharmacists have been observed uncomfortable with treating such patients (Amber *et al*., 2008). The reasons has mainly to do with the social stigma, however the dynamics of the health care system of Pakistan are different as the health care system struggles to integrate the pharmacists in the system and the full fledge recognition of pharmacist is hindered by the other allied health professions to some extent (Adnan *et al*., 2014). Moreover, the Pakistani society at large suffers from depression due to a variety of reasons which not only includes the clinical aspects but also the social adversities, political and economic factors (Husain *et al*., 2000). Furthermore, the educational environment of Pakistan is no different, as several studies have reported the depression among the students of medical colleges in Pakistan (Muhammad *et al*., 2006; Rab *et al*., 2008).

However, no study till date has quantified the depression in undergraduate pharmacy students of Pakistan and the

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perceptions regarding it. It can be said that the students of the pharmacy are best aware of the disease and its management since they not only study the disease pharmacotherapy but also have a practical experience of dealing with such patients.

The study was aimed at finding the prevalence and the perceptions regarding depression among pharmacy undergraduates of Pakistan.

Methods

A quantitative cross-sectional study was conducted in pharmacy institutions of Pakistan for ten months *i.e.* March 2013 to December 2013 with a research instrument.

Research instrument

A research instrument consisting of a structured questionnaire in English language based on a questionnaire described by Bell *et. al* (2006). It was piloted on a number of pharmacy students before real time data collection. However, the piloted results were not included in the study.

Ethical approval and informed consent

An approval from the educational institutes was sought and students were explained about the study and its related information and an informed, verbal consent was sought prior to initiation of data collection.

Inclusion Exclusion Criterion

The inclusion exclusion criteria were set as all pharmacy undergraduates were included in the study and post graduates pursuing higher studies in pharmacy and/or any other field, and the rest of the undergraduates of other fields of study were excluded from the study.

Target population

The target population was the undergraduate pharmacy students of Pakistan and a total of 500 questionnaires were distributed among pharmacy students of different universities. 433 questionnaires were documented and analysed after passing through the inclusion exclusion criteria.

Data analysis

The data analysis was carried out by SPSS® v.19 (Statistical Package for Social Sciences version 19) and MedCalc® (Easy to use statistical software). The epidemiological calculations were done by MedCalc® and the rest of the analysis was performed using SPSS® v.19. Central tendencies, descriptive and inferential statistics were used to interpret the data. The interpretation tools included Mean (X), Standard deviation SD to demonstrate the central tendencies. The percentage (%) and significant *p* values (*p* value <0.05) were used to demonstrate the data inferentially.

Conceptual Framework

The study hypothesised that the undergraduate pharmacy students are aware of the depression affecting the society at large and are able to cope up with the problem socially. The prevalence of depression in the students is minimal since they are sentient regarding the ailment.

Results

A total of 500 questionnaires were given to the respondents out of which 433 were received giving a response rate of 86.6%. The results of the study are presented in the following subsections:

1. Demographic information
2. Epidemiological information
3. Social information

Demographic information

The study revealed that the majority of the students (N = 348, 80.4%) belonged to the age group ranging from 20-25 years and few (N = 85, 19.6%) belonged to the age group ranging from 18-20 years. In terms of the gender distribution male students accounted for a third (N = 158, 36.5%) of the total included, however the gender distribution was heavily dominated by the females (N = 275, 63.5%). Almost half of the students were affiliated to private sector universities (N = 240, 55.4%) and public sector universities with the number slightly tilted towards the latter (N = 193, 44.6%). With respect to the level of education in Pharmacy it was reported that the students from 1st year were seen to be a quarter of the total surveyed (N = 104, 24%), 2nd year student make up a fifth of the total (N = 91, 21%), 3rd year and 4th year were seen at less than a fifth of the total *i.e.* (N = 63, 14.5%) and (N = 82, 18.9%) respectively. The 5th year pharmacy students make up a slightly more than a fifth (N = 93, 21.5%). The demographic information is summarised in the Table I.

Epidemiological information

With regards to the epidemiology, the prevalence of depression in the male and female students was found to be 59.49% (51.40% to 67.22% for 95% CI) and 64% (58.91% to 68.86% for 95% CI) respectively. In addition to that, it was also reported that the prevalence of depression in public sector universities was found to be 49.74% (42.48% to 57.01% for 95% CI) and in private sector universities reported at 53.33% (46.81% to 59.78% for 95% CI). The epidemiological information is summarised in Table II.

In terms of the breakdown in the professional years of undergraduate pharmacy curriculum, the prevalence among the undergrads of 1st year pharmacy students was reported to be 66.35% (56.42 to 75.32% for 95% CI). In 2nd year it was observed at 68.84% (54.12% to 74.56% for 95% CI). For 3rd year it was seen to drop at 52.38% (39.41% to 65.12% for 95% CI). In case of the 4th year it

Table I: Summary of demographics

S.No	Attributes	Observed (N)	Observed (%)	Expected (N)	Mean (X)	Standard Deviation (SD)	*p*-value
1	**Age of students**						
1.1	18-20 years	85	19.6%	216.5			
1.2	20-25 years	348	80.4%	216.5	1.80	0.398	*<0.01*
	Total	**433**	**100%**	**433**			
2	**Gender**						
2.1	Male students	158	36.5%	216.5			
2.2	Female students	275	63.5%	216.5	1.64	0.482	*<0.01*
	Total	**433**	**100%**	**433**			
3	**Type of university**						
3.1	Public sector	193	44.6%	216.5			
3.2	Private sector	240	55.4%	216.5	1.55	0.498	*<0.05*
	Total	**433**	**100%**	**433**			
4	**Professional year of Pharmacy**						
4.1	1st year Pharmacy	104	24%	86.6			
4.2	2nd year Pharmacy	91	21%	86.6			
4.3	3rd year Pharmacy	63	14.5%	86.6	2.93	1.490	*<0.05*
4.4	4th year Pharmacy	82	18.9%	86.6			
4.5	5th year Pharmacy	93	21.5%	86.6			
	Total	**433**	**100%**	**433**			

Table II: Summary of epidemiological information

S.No	Attributes	%	95% CI
1	**Prevalence of depression in male students**		
1.1	Disease Prevalence	59.49%	51.40% to 67.22%
1.2	Sensitivity	85.11%	76.27% to 91.61%
1.3	Specificity	93.75%	84.75% to 98.23%
1.4	Positive likelihood ratio	13.62%	5.25% to 35.30%
2	**Prevalence of depression in female students**		
2.1	Disease Prevalence	64.00%	58.91% to 68.86%
2.2	Sensitivity	50.00%	43.50% to 56.50%
2.3	Specificity	88.89%	82.33% to 93.64%
2.4	Positive likelihood ratio	4.50%	2.75% to 7.37%
3	**Prevalence of depression in public sector university students**		
3.1	Disease Prevalence	49.74%	42.48% to 57.01%
3.2	Sensitivity	93.75%	86.88% to 97.66%
3.3	Specificity	92.78%	85.69% to 97.04%
3.4	Positive likelihood ratio	12.99%	6.35% to 26.57%
4	**Prevalence of depression in private sector university students**		
4.1	Disease Prevalence	53.33%	46.81% to 59.78%
4.2	Sensitivity	85.94%	78.69% to 91.44%
4.3	Specificity	89.29%	82.03% to 94.33%
4.4	Positive likelihood ratio	8.02%	4.68% to 13.75%

slightly to 51.61% (41.01% to 62.11% for 95% CI). The positive likelihood ratios for all the professional year were >10 which confirms the finding and increased the probability of the disease. However, in the 3rd year it was >5 which also reports a moderate to high probability of the disease but relatively less as compared to the others. Table III summarises the epidemiological findings in breakdown of professional years.

Social information

With regards to the personal experiences, majority (N = 330, 76.2%) never visited any institute dedicated for such individuals and few (N = 103, 23.8%) experienced such a visit. Furthermore, a half of the target segment (N = 214, 49.4%) had encountered depressed individuals in their personal experiences and half (N = 219, 50.6%) did not. In addition, when the question of living with such individual was put forward, major segment of target group (N = 276, 63.7%) expressed their unwillingness to do so however only a third (N = 157, 36.3%) seemed willing. Moreover, the majority (N = 282, 65.1%) was unwilling to socialise with such people and only a third (N = 148, 34.2%) expressed their willingness. Few (N = 3, 0.7%) did not respond to the question.

Additionally, the professional aspects were also investigated in the study, the almost a half (N = 188, 43.4%) expressed willingness to work alongside such persons and slightly greater percentage of the target group (N = 245, 56.6%) responded negatively. However, when the question of recommendation of such persons for a job was asked, a large segment of students (N = 255, 58.9%) expressed their willingness to do so with few not responding to the question in favor (N = 172, 39.7%), few (N = 6, 1.4%) refrained from answering the question.

was reported at the lowest i.e. 46.34% (35.25% to 57.70% for 95% CI) and finally for the 5th year it increased

Table III: Prevalence of depression by breakdown of professional years of pharmacy curriculum

1	Prevalence of depression in 1st professional year of pharmacy		
1.1	Disease Prevalence	65.35%	56.42% to 75.32%
1.2	Sensitivity	71.01%	58.84% to 81.31%
1.3	Specificity	97.14%	85.03% to 99.52%
1.4	Positive likelihood ratio	24.86%	3.58% to 172.56%
2	Prevalence of depression in 2nd professional year of pharmacy		
2.1	Disease Prevalence	64.84%	54.12% to 74.56%
2.2	Sensitivity	83.05%	71.03% to 91.55%
2.3	Specificity	96.88%	83.73% to 99.48%
2.4	Positive likelihood ratio	26.56%	3.85% to 183.57%
3	Prevalence of depression in 3rd professional year of pharmacy		
3.1	Disease Prevalence	52.38%	39.41% to 65.12%
3.2	Sensitivity	90.91%	75.64% to 97.98%
3.3	Specificity	83.33%	65.27% to 94.30%
3.4	Positive likelihood ratio	5.45%	2.43% to 12.23%
4	Prevalence of depression in 4th professional year of pharmacy		
4.1	Disease Prevalence	46.34%	35.25% to 57.70%
4.2	Sensitivity	92.11%	78.60% to 98.25%
4.3	Specificity	90.91%	78.31% to 97.41%
4.4	Positive likelihood ratio	10.13%	3.96% to 25.91%
5	Prevalence of depression in 5th professional year of pharmacy		
5.1	Disease Prevalence	51.61%	41.01% to 62.11%
5.2	Sensitivity	93.75%	82.78% to 98.62%
5.3	Specificity	99.98%	92.05% to 100.0%
5.4	Positive likelihood ratio	26.56%	3.85% to 183.57%

The graphical distribution of the epidemiological findings is illustrated in Figure 1-4.

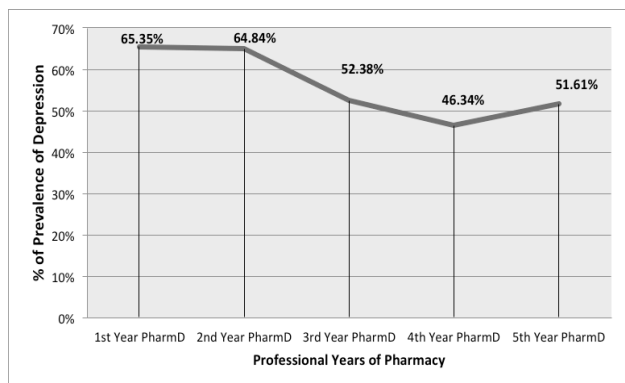**Figure 1: Prevalence of depression in professions years of Pharmacy**

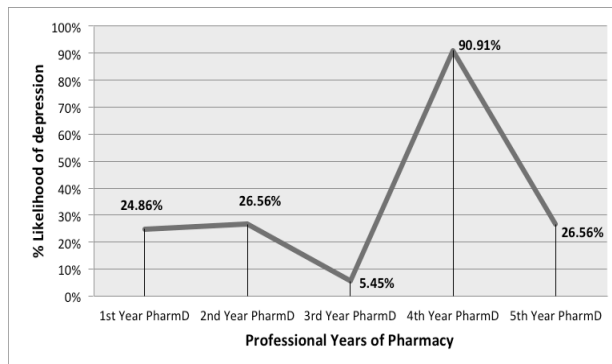**Figure 2: Likelihood of depression in professional years of Pharmacy**

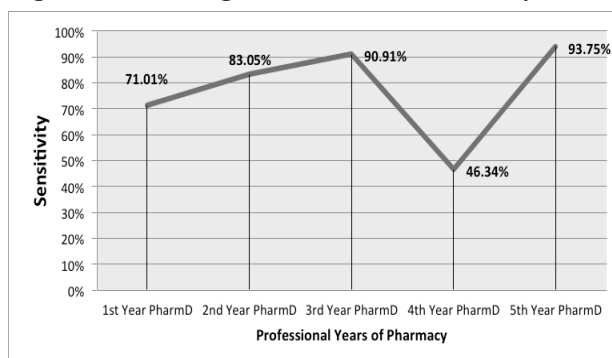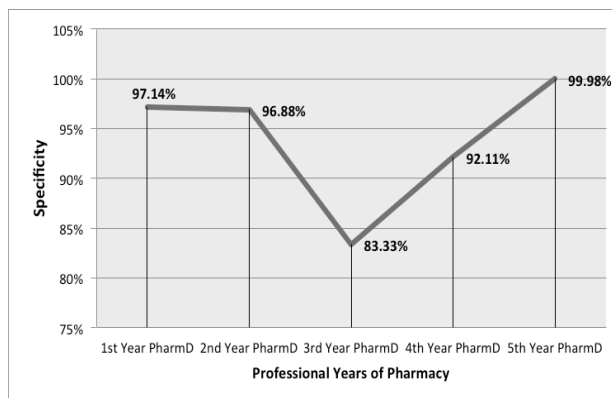**Figure 3: Percentage distribution of sensitivity**

Figure 4: Percentage distributions of specificity

In relation to the health related matters with depression, the bulk of students (N = 172, 39.7%) believed the depressed individuals are a threat to the people however a quarter of the target group (N = 114, 26.3%) did not agree with this and a third (N = 147, 34%) refrained from responding to the question. The majority disagreed with the idea of a depressed individual can never recover (N = 300, 69.3%) and no improvements despite treatment (N = 307, 70.9%). The results are summarised in Table IV.

Table IV: Summary of social information

S.No	Attributes	Observed (N)	Observed (%)	Expected (N)	Mean (X)	Standard Deviation (SD)	*p*-value
1	**Suffered from depression**						
1.1	Yes	219	50.6%	216.5	1.49	0.501	>*0.05*
1.2	No	214	49.4%	216.5			
	Total	**433**	**100%**	**433**			
2	**Visit an institute for depressed patients**						
2.1	Yes	103	23.8%	216.5	1.76	0.426	<*0.01*
2.2	No	330	76.2%	216.5			
	Total	**433**	**100%**	**433**			
3	**Personal experience with depressive patients**						
3.1	Yes	214	49.4%	216.5	1.51	0.501	>*0.05*
3.2	No	219	50.6%	216.5			
	Total	**433**	**100%**	**433**			
4	**Live with a depressed person**						
4.1	Willing	157	36.3%	216.5	1.64	0.481	<*0.01*
4.2	Un willing	276	63.7%	216.5			
	Total	**433**	**100%**	**433**			
5	**Work alongside a depressed person**						
5.1	Willing	188	43.4%	216.5	1.57	0.496	<*0.05*
5.2	Un willing	245	56.6%	216.5			
	Total	**433**	**100%**	**433**			
6	**Socialize with a depressed person**						
6.1	Willing	148	34.2%	144.3			
6.2	Un willing	282	65.1%	144.3	1.67	0.487	<*0.01*
6.3	No response	3	0.7%	144.3			
	Total	**433**	**100%**	**433**			
7	**Recommend the depressed person for a job**						
7.1	Willing	255	58.9%	144.3			
7.2	Un willing	172	39.7%	144.3	1.42	0.522	<*0.01*
7.3	No response	6	1.4%	144.3			
	Total	**433**	**100%**	**433**			
8	**Believe depressed persons are a threat to others**						
8.1	Agree	172	39.7%	144.3			
8.2	Disagree	114	26.3%	144.3	1.93	0.856	<*0.01*
8.3	No response	147	34%	144.3			
	Total	**433**	**100%**	**433**			
9	**Depressed person never recover**						
9.1	Agree	94	21.7%	144.3	1.873	0.540	
9.2	Disagree	300	69.3%	144.3			<*0.01*
9.3	No response	39	9%	144.3			
	Total	**433**	**100%**	**433**			
10	**No improvement in depression if treated**						
10.1	Agree	86	19.9%	144.3			
10.2	Disagree	307	70.9%	144.3	1.893	0.529	<*0.01*
10.3	No response	40	9.2%	144.3			
	Total	**433**	**100%**	**433**			

Discussion

Depression is a psychosocial disease which not only needs the pharmacological treatment but psychological support in its pharmacotherapy plan, patient education becomes the core focus of effective disease state management and if the patient is aware of the disease and its complexities, studies reported that it could be managed more aptly (James *et al.*, 2001). The current study hypothesised that the undergraduate pharmacy students are aware of the depression affecting the society at large and are able to cope up with the problem socially and the prevalence of depression in undergraduate pharmacy students is nominal since they are sentient regarding the ailment. The study investigated this phenomenon in

undergraduate pharmacy students of Pakistan and the level of significance was set at *p* values less than 0.05.

The study revealed a high percentage of females (63.5%) to males (36.5%) was at hand in the universities which is a common scenario in the educational institutes of Pakistan. It endorses the findings of the previous reported studies regarding gender distribution in pharmacy universities of Pakistan (Anis *et al*., 2011; Rafia, 2013). The majority of the students (80.4%) belonged to the age group of 20-25 years which is the common age group of the undergraduates. The survey incorporated the students from both the public and private sector universities and from all professional years of undergraduate pharmacy degree program.

However the prevalence was high and it was observed that the perceptions of the undergraduate pharmacy students were unwelcoming at the same time. The prevalence was reported to be high among the females it was seen soaring up to 64% (58.91% to 68.86% for 95% CI) as compared to the males 59.49% (51.40% to 67.22% for 95% CI). This reiterates the finding of Rab *et al*. (2014) which reported hype in the female students of the medical colleges of Pakistan. It also reconfirmed the finding of Liselotte *et al*. (2006) which reported the high percentage of female students suffering from depression in the United States (US) and Canadian medical colleges. The high prevalence could be due to the socioeconomic, political and associated factors of Pakistan and virtually presents an enantiomeric picture of educational institutes of the country to the general society. With respect to the type of the universities the prevalence was high among students of private sector universities 53.33% (46.81% to 59.78% for 95% CI). It can be explained due to the fact that private universities follow a more stringent mode of teaching and work load on the students as compared to the public sector. Due to this hefty exertion and toil, there is a likelihood that the students may get depressed. A half of the target segment surveyed encountered depressed individuals in their personal experiences. Surprisingly, the bulk of undergraduates were seen unwilling to live and socialise with such individuals. This observation reiterates the findings of Bell *et al*. (2006) which reported the same trend in students in Australia that despite education and practical experience of treatment of depression, the student's social stigma regarding depression is not affected. On the contrary, the majority of the students were in favour of incorporating such individuals in professional services which can be explained by the fact that diverting the concentration in different work and healthy activities helps counter depression (Helpguide, 2014).

The students for most part were reported highlighting a depressed individual as a threat to the society and some of them refrained from responding to this question due to the sensitivity of the topic. This attitude is mainly related to the student's perception of a depressed individual having potential to ruin not only his or her life but also affect others in the community (Ezine articles, 2014). Since the students are aware of the pharmacotherapy, they expressed their optimism in treatment of depressed individuals and hopes of recovery. The prevalence of depression has seen a swelling and dilapidated trend in the course of five years of undergraduate pharmacy. The prevalence in the 1st year was reported the highest *i.e.* 66.35% (56.42 to 75.32% for 95% CI) which in due course declined gradually and was reported lowest in the 4th professional year i.e. 46.34% (35.25% to 57.70% for 95% CI). However it rose again in the final fifth professional year to 51.61% (41.01% to 62.11% for 95% CI). One of the possible explanations to this can be the fact that in the 1st professional, the students coming from different high schools/ intermediate colleges are new to the professional environment and thereby unaware of the norms of such educational upbringing. When they eventually get exposed to such a high wire environment, they develop a tendency to get upset and disheartened which demonstrate the high prevalence. The declining trend can be explained by the fact that as the students get used to the educational atmosphere, they find their comfort zone sooner or later. The trivial increase in the prevalence in the 5th professional can be best explained by the fact that students mindset *i.e.* after the last scheduled academic year, they are deemed to be exposed to the professional milieu and hence are vexed of the upshot. This encores the findings of Goncalves *et al*. (2012) of depressive symptoms in undergraduates of pharmacy in Syria in 2012 and also reiterates the results of the study conducted by Karren *et al*. (2013) in students of universities in US which reported the prevalence to 52.4%. Our study reported that the prevalence of depression in undergraduate pharmacy students of Pakistan presents a similar picture to the students of the US, Canada and countries of the Middle East (Liselotte *et al*., 2006; Goncalves *et al*., 2012; Karren *et al*., 2013).

Conclusion

The prevalence of depression among undergraduate pharmacy students is high and similar to developed countries. The pharmacy education did not help in the minimising social stigmatisation of undergraduate pharmacy students regarding depression however improved their optimism regarding its treatment.

Conflict of interests

The authors declare no conflict of interests exists

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