

Medical Students' Beliefs and Attitudes Towards Schizophrenia Before and After Psychiatric Training in Almaarefa Colleges, Riyadh, Saudi Arabia

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ABSTRACT

Background: Public surveys have shown that the general population has limited knowledge about mental illness and holds unfavorable attitudes towards the people who suffer from it in various, culturally diverse, countries.

Aims: The aim of the present study was to explore medical students' beliefs and attitudes towards people with schizophrenia (PwS) prior to receiving any training in psychiatry and to assess the impact of the psychiatric placement on changing them.

Methods: A questionnaire addressing beliefs, attitudes and desired social distance from PwS was distributed to all final year medical students before the beginning of their 4-week undergraduate psychiatric placement and upon its completion.

Results: Students did not endorse stereotypes commonly attached to PwS, such as being dangerous, lazy or of lower intelligence, but they held the view that PwS are unpredictable and suffer from split personality. Furthermore, the baseline level of desired social distance was found to increase as the intimacy of the interaction increased, and the only variable associated with it was personal experience of serious mental illness. Moreover, the placement was found to have either no influence at all or in a negative direction. Upon its completion more students were found to believe that PwS couldn't recover, have no insight into their condition, cannot make reasonable decisions, cannot work in regular jobs and are dangerous to the public. No difference was recorded in social distance scores.

Conclusions: A close and critical examination of the various elements of the undergraduate placement in psychiatry is needed in order to develop an evidence based, fully rounded education with an anti-stigma orientation.

Keywords: attitudes, medical students, mental illness, schizophrenia, stigma

INTRODUCTION

The stigma and prejudice surrounding mental illness exist widely throughout the world. Public surveys have shown that the general population has limited knowledge about mental illness and holds unfavorable attitudes towards the people who suffer from it in various, culturally diverse, countries.⁽¹⁻³⁾ Nonetheless, stigmatizing attitudes to mental illness, and especially schizophrenia, the most representative of the psychiatric disorders in lay people's minds,⁽⁴⁾ are not limited to the general population but are also common among health professionals. Many surveys have shown that medical doctors endorse stereotypical views and negative attitudes towards patients with psychiatric disorders.^(5,6) This finding has also been validated by first-person accounts of people with mental illness. Focus group studies have found that when service users were asked about their stigma experiences and about potential groups for targeted anti-stigma interventions, family doctors were the group most often mentioned⁽⁷⁾.

Service users reported that health-care providers treated them disrespectfully where they had to wait longer than other patients and that their

physical complaints were not taken seriously⁽⁸⁾. In addition, various studies have indicated that stigma and discrimination by physicians often lead to people with psychiatric disorders having less access to primary care,⁽⁹⁾ and receiving inferior care for physical health problems, such as heart attacks,⁽¹⁰⁾ despite the high rates of physical illness and mortality among them^(11,12). It is thus imperative to develop effective strategies for improving physicians' attitudes and practices towards people with mental illness. One of the strategies that have been proposed is that of targeting medical students, who are considered 'tomorrow's doctors'⁽¹³⁾. A cohort study in England demonstrated that while 28% of medical students reported that people with psychiatric disorders are not 'easy to like', 2 years later, when students had become medical practitioners, the rate increased to 56%⁽¹⁴⁾.

Furthermore, a wealth of studies worldwide has shown that medical students hold rejecting and distancing attitudes towards people with mental illness⁽¹⁵⁻¹⁷⁾. These negative misconceptions not only impact on people with psychiatric disorders and their families, they also damage the image of psychiatry, because the majority of medical

students show diminished interest in pursuing it as a career⁽¹⁸⁾ with subsequent shortages of psychiatrists globally. Consequently, it seems of paramount importance to explore and ultimately alter the inaccurate knowledge and unfavorable attitudes towards people with mental illness in this particular group. The role of undergraduate psychiatric placement has been emphasized as the means of inducing change in medical students' stigma endorsement. Prior to any formal training in psychiatry, medical students share the same beliefs and attitudes as the general population.^(17, 19) During the psychiatric placement, however, students have the opportunity to advance their knowledge about mental illness and to closely interact with people who suffer from it. According to this rationale, undergraduate training in psychiatry is expected to reduce stigma and discrimination. Empirical evidence supports this effect⁽²⁰⁻²²⁾ although some studies have yielded contradictory results^(15, 23). This discrepancy in the literature can be ascribed to the variability of undergraduate psychiatric training courses across countries, in spite of continuous efforts on the part of the World Psychiatric Association (WPA) to standardize it. As a result, undergraduate psychiatric training is of central interest for an anti-stigma program, because its curriculum integrates two effective strategies for fighting stigma and discrimination⁽²⁴⁾.

In Riyadh, a national study on lay beliefs and attitudes towards patients with schizophrenia has found that the general population is more rejecting and distancing towards people with schizophrenia in comparison to the general population in Germany and Canada^(2, 25). Similarly to the general population, equally stigmatizing attitudes have been expressed by non-psychiatry physicians, who have been constantly complaining about the treatment of patients with severe mental illness in general hospitals. Congruent with this and building upon previous work, the Saudi "Anti-Stigma" Program, run by the Universities, conducted an investigation into stigma endorsement in medical students within the framework of the WPA 'Open the Doors global program against stigma and discrimination because of schizophrenia'.

The study explored medical students' beliefs, attitudes and desired social distance towards people with schizophrenia (PwS) and assessed the impact of undergraduate psychiatric education in changing them. To achieve these aims a pre/post-test design was followed, similarly to other studies on the same topic⁽⁶⁾.

METHODS

Sample

All medical students in the sixth year (final) of undergraduate medical training were recruited for the present study at the beginning of their psychiatric placement. Students were informed about the purpose of the study and were assured that their responses would remain confidential. Of the 160 students who were approached, 158 agreed to participate (response rate: 98.8%).

The study was done after approval of ethical board of Almaarefa Colleges, Riyadh.

MATERIALS AND METHODS

A demographics form collected information on participant gender, age, socioeconomic status, marital status and personal experience of mental illness. Participant beliefs and attitudes towards PwS were assessed using selected questions from the Alberta Pilot Site Questionnaire Tool Kit, which has been pilot tested in various surveys addressing lay people, medical students and patients with schizophrenia in Canada,⁽²⁶⁾ and had been subsequently used in studies conducted within the framework of the WPA 'Open the Doors' Program^(3, 6, 27). The Saudi version of the Tool Kit addressing medical students' stigma endorsement was translated and back-translated by two bilingual professionals and a focus group was then conducted to confirm the instrument's validity in Riyadh. The instrument was field tested on 30 medical students prior to its incorporation in the present study and amendments were made accordingly. Its final version entailed the two following sections; the first section referred to beliefs and attitudes, and encompassed 17 items addressing various beliefs and attitudes towards PwS. Answers were rated on a 5-point Likert scale ranging from 'always' to 'never'. Some items were negatively phrased in order to avoid response bias. The internal consistency of the scale was found to be low (Cronbach α : 0.47-0.53). Because the majority of items had poor item-total correlations (< 0.03) and the correlation matrix showed that most of the correlation coefficients were close to zero, this particular section of the instrument was not manipulated as a scale. Furthermore, the questionnaire encompassed a Social Distance section, which incorporated a corresponding scale. The section consisted of 14 items, which required respondents to indicate their willingness to interact with PwS in social encounters of variable intimacy. Answers were on a 5-point Likert scale ranging from 'definitely yes' to 'definitely no'. Some items were reverse scored

in order to avoid response and acquiescence bias. Adding up the scores for each item, after taking into account the reverse wording, resulted in a cumulative social distance score, with high scores indicating greater desire to maintain distance from PwS. A previous study examined the psychometric properties of the Social Distance scale in the general population in Riyadh and found high internal consistency (Cronbach $\alpha = 0.837$) and good validity⁽²⁸⁾. Similarly, the internal consistency of the scale in the present study was equally high (Cronbach $\alpha: 0.83-0.87$).

Placement

The psychiatric placement was 4 weeks in total and took place in the main psychiatric hospitals and in psychiatric departments of general hospitals in Riyadh. It entailed both theoretical and practical aspects. Specifically, during the first 2 weeks, emphasis was placed on lectures covering the main psychiatric disorders, their clinical manifestations and modes of treatment. The approach was largely based on the biological model. At the same time, students complemented their theoretical knowledge by observing clinical cases in the inpatient and outpatient units of the hospitals. During the last 2 weeks, students assumed partial responsibility for some clinical cases under the supervision of psychiatric residents and psychiatrists.

Procedure

At the beginning of the psychiatric placement, the purpose of the study was explained to students and the questionnaires were distributed. Upon completion of the training, questionnaires were distributed again. The research protocol was approved by Almaarefa Colleges, Riyadh, Saudi Arabia.

Statistical analysis

For the Beliefs and Attitudes section of the stigma instrument, analysis was carried out on an item level due to moderate reliability of a composite scale. In contrast, the items pertaining to the social distance section were analyzed both on an item and scale level. For the calculation of the composite social distance score, negatively phrased items were reversed (value subtraction from 6) and participant responses were added up. For the exploration of the interrelations among various demographic variables and the distribution of responses per item, chi-squared analysis was conducted on pooled responses in order to increase the statistical power of the analysis and avoid

violations of the chi-squared assumptions (e.g. <20% of cells should have cell size <5 participants). In contrast, the influences of gender and of personal experience of mental illness on the cumulative social distance score were explored by using the t-test for independent samples. For the investigation of the impact of the psychiatric placement on medical students' views, attitudes and social distance scores, the McNemar–Bowker test was used for comparing item frequencies before and after the training, and paired t-test was used for comparing social distance composite scores. Analyses were performed using SPSS version 13 (SPSS, Chicago, IL, USA).

RESULTS

Sample characteristics

Of the 158 participants who initially agreed to participate in the study, three were lost to follow up. Therefore, the data of 155 participants were analyzed. Among them, 78 were men (50.3%) and 77 were women (49.7%) with a mean age of 24.99 years (age range, 23–34 years). The vast majorities were unmarried (93.5%) and have Saudi origin (94.7%). More than half were of middle socioeconomic status (54.3%) and 55.2% reported knowing someone with serious mental illness.

Baseline beliefs, attitudes and social distance towards PwS

As a whole, medical students displayed mixed opinions and attitudes towards PwS (Table 1). On the one hand, the majority disagreed that PwS were lazy or irresponsible, of lower intelligence, incapable of working in regular jobs and dangerous, and correctly identified that schizophrenia is neither a contagious disease nor the result of poor parenting. On the other hand, the majority believed that PwS are unpredictable, can be seen talking to themselves and suffer from split personality. The ability of PwS to make reasonable decisions, their insight into their condition, their potential for recovery, their course of illness and their potential to be a public nuisance elicited conflicting responses and a great proportion of students was unsure about endorsing these items. Regarding social distance items, the proportion of students who agreed, disagreed and remained neutral is given in table (2).

It is noteworthy that as the level of intimacy increased, desired social distance increased as well. The strongest reactions were elicited by marrying or sharing a room with a PwS. In addition, a large percentage of students would be reluctant to go to a hairdresser who had

schizophrenia. In contrast, social encounters that did not necessitate close interaction, such as sitting next to someone in a car, lending a possession or being a neighbor to a PwS evoked less distancing attitudes. The variables that appeared to play a role in the baseline opinions and attitudes were those of gender and personal experience.

There was a gender difference in one item: 'PwS need prescription drugs to control their symptoms' (98.7% of women believed that this is always/often the case vs 88.5% of men; $c^2 = 6.83$, $d.f. = 2$, $P = 0.03$); and personal experience had a significant effect in four items. Among the respondents who believed that PwS are mentally retarded, 80% had no experience of serious mental illness (vs 20% who had; $c^2 = 10.7$, $d.f. = 2$, $P = 0.001$). For the other three items, the significant difference lay in the proportion of students who were unsure about the content of the statements: for 'PwS can be successfully treated without drugs using psychotherapy or social interventions', 91.7% of those who were unsure had experience of serious mental illness (vs 8.3% who did not; $c^2 = 7$, $d.f. = 2$, $P = 0.03$); for 'PwS are lazy and irresponsible', 83.3% of students who were unsure had experience (vs 16.7% who did not; $c^2 = 7.11$, $d.f. = 2$, $P = 0.03$); and for 'PwS can work in regular jobs', 73.9% of those who were unsure did not have experience of serious mental illness (vs 26.1% who did; $c^2 = 10.05$, $d.f. = 2$, $P = 0.001$). When exploring the impact of gender and personal experience on social distance items, gender differences were substantial only for two items: the majority of the respondents who would be disturbed to share a room with a PwS and who would feel ashamed if someone in their family was diagnosed with schizophrenia were women (54.2% vs 45.8% of men, $c^2 = 4.74$, $d.f. = 1$, $P = 0.03$ for sharing a room; and 64.8% vs 35.2% of men, $c^2 = 7.84$, $d.f. = 1$, $P = 0.01$ for having a family member with schizophrenia).

Moreover, people without experience of serious mental illness appeared more distancing towards PwS: the majority of the respondents who would be afraid to start a conversation with a PwS had no experience of serious mental illness (66.7% vs 33.3% who had, $c^2 = 6.45$, $d.f. = 1$, $P = 0.01$). In contrast, the majority of the respondents who would start a friendship with a PwS, would decide to live in a neighborhood where a mental health service is located and would live in a building where a PwS also resides were people with experience of serious mental illness (69.7% vs

33.3%, $c^2 (1) = 8.48$, $d.f. = 1$, $P = 0.004$ for starting a friendship; 60.6% vs 39.4%, $c^2 = 5.3$, $d.f. = 1$, $P = 0.021$ for living in a neighborhood; 59.1% vs 40.9% for living in the same building: $c^2 = 4.37$, $d.f. = 1$, $P = 0.037$). When social distance was analyzed as a scale score, there was no effect of gender, socioeconomic status, or age ($P > 0.05$). Nonetheless, students with personal experience of serious mental illness were less distancing than students without such an experience (mean \pm SD, 35.55 ± 9.33 vs 38.93 ± 10.04 , $t = 2.16$, $d.f. = 152$, $P = 0.03$).

Impact of undergraduate psychiatric education on beliefs, attitudes and social distance from PwS; the influence of the psychiatric placement into improving medical students' beliefs and attitudes towards schizophrenia was mixed. The differences between pre- and post-placement measures can also be found in Table (1). On the one hand, the training did improve certain beliefs. Fewer people believed upon completion of the training that schizophrenia is the result of poor parenting, that PwS suffer from split or multiple personality disorder and that they are unpredictable; whereas more students endorsed the view that PwS can be successfully treated in the community. On the other hand, the placement seemed to intensify stigma overall. In particular, more people agreed that PwS cannot work and that they are dangerous to the public.

Furthermore, more medical students believed that PwS have no insight into their condition and cannot make reasonable decisions regarding their lives. In terms of the course of illness, more participants stated that, after undergoing the undergraduate psychiatric training, PwS get worse with time and that they cannot recover. In addition, the placement did not challenge the stereotypical view of many medical students that PwS can be seen talking to themselves or shouting in city streets and that they are a public nuisance. Social Distance scores did not seem to change after the completion of the placement.

The item responses were not significantly different between pre placement and post-placement time points (Table 2), a finding that was further supported by the lack of significant difference in social distance composite scores (baseline score, 37.08 ± 9.74 vs post-training score 36.26 ± 8.74 ; pairwise $t = 1.03$, $d.f. = 154$, $P = 0.03$).

Table (1): Medical students’ beliefs and attitudes to PwS before and after undergraduate psychiatric training

	Undergraduate psychiatric training						<i>P</i> [†]
	Before (<i>n</i> = 155)			After (<i>n</i> = 155)			
Beliefs and Attitudes Items	Always/ Often (%)	Seldom/ Never (%)	Unsure (%)	Always/ Often (%)	Seldom/ Never (%)	Unsure (%)	
PwS can recover	45.2	40	14.8	35.8	56.8	7.7	0.017*
Schizophrenia is not a contagious disease	87.7	12.3	0	96.8	3.2	0	0.001**
PwS are lazy and irresponsible	3.9	84	11.6	5.2	92.3	2.6	0.004**
PwS have insight into their condition and are capable of reporting accurately the outcome of their treatment	36.8	37.4	25.8	29	69.1	9.0	0.001**
PwS can make reasonable decisions concerning their lives	37.4	46.5	16.1	25.8	63.9	10.3	0.005**
PwS are unpredictable	83.8	5.2	11.0	79.2	17.5	3.2	0.001**
PwS get worse as time passes by	40.3	27.9	31.8	58.4	29.2	12.3	0.001**
Schizophrenia is the result of poor parenting	6.5	81.2	12.3	1.9	94.2	3	0.002**
PwS tend to be mentally retarded or of lower intelligence	6.5	89	4.5	4.5	89	6.5	0.540
PwS can be successfully treated outside of hospital in the community	85.2	11.6	3.2	89.7	10.3	0	0.503
PwS need prescription drugs to control their symptoms	93.5	5.2	1.3	98.1	0.6	1.3	0.066
Can be successfully treated without drugs using psychotherapy or social interventions.	16.1	75.5	8.4	11.6	84.5	3.9	0.073
PwS are a public nuisance due to panhandling, poor hygiene or odd behaviour	43.9	45.2	11.	48.4	45.2	6.5	0.081
PwS suffer from split or multiple personalities	60.0	23.9	16.1	43.9	46.5	9.7	0.001**
PwS can be seen talking to themselves or shouting in city streets	85.2	11.6	3.2	85.2	11.6	3.2	0.767
PwS can work in regular jobs	51.6	34.2	14.2	46.5	49	4.5	0.001**
PwS are dangerous to the public because of violent behaviour	27.1	66.5	6.5	41.9	56.8	1.3	0.006**

*Significant result at the *P* ≤ 0.05 levels. **Significant result at the *P* ≤ 0.01 levels.

[†]McNemar–Bowker test.

PWS, people with schizophrenia.

Table (2): Medical students' social distance from PwS before and after undergraduate psychiatric training

	Undergraduate psychiatric training				<i>P</i> [†]
	Before		After		
Social distance items	Definitely/ Probably Yes (%)	Definitely/ Probably No (%)	Definitely/ Probably Yes (%)	Definitely/ Probably No (%)	
Would you decide to live in house building, where a person with schizophrenia also resides?	82.4	17.6	90.2	9.8	0.004*
Feel afraid to have a conversation with someone who has schizophrenia?	19.9	80.1	16.6	83.4	0.533
Be upset or disturbed about working on the same job with someone who has schizophrenia?	30.7	69.3	26.1	73.9	0.337
Feel upset or disturbed about rooming with someone who has schizophrenia?	78.6	21.4	72.4	27.6	0.211
Feel ashamed if people knew someone in your family was diagnosed with schizophrenia	35.9	64.1	35.2	64.8	1.000
Feel annoyed or disturbed about sitting next to someone with schizophrenia in the bus?	7.8	92.2	11.8	88.2	0.286
Be unable to maintain a friendship with someone who has schizophrenia	69.9	30.1	66.4	33.6	0.511
Would marry someone with schizophrenia?	5.8	94.2	6.6	93.4	1.000
Would lend anything of yours to someone with schizophrenia?	85	15	85	15	1.000
Would you accept a person with schizophrenia as your hairdresser?	38.9	61.1	41	59	0.784
Would you rent your house to someone with schizophrenia?	56.5	43.5	62.6	37.4	0.243
Would you hire someone with schizophrenia?	60.9	39.1	62.4	37.6	0.864
Would you decide to live in neighborhood, where an institution for the treatment of PwS is operating?	84.8	15.2	84.8	15.2	1.000
Would you start a friendship with someone with schizophrenia?	49.3	50.7	58.1	41.9	0.111

*Significant result at the $P \leq 0.01$ level.

[†]McNemar–Bowker test. PWS, people with schizophrenia.

DISCUSSION

The present study had the twofold aim of investigating medical students' beliefs, attitudes and desired social distance from PwS prior to receiving any formal training in psychiatry as well as of evaluating the effect of the psychiatric placement in improving them. Concerning the former aim, the present data suggest that medical students hold complex views about PwS, some being favorable and some not. Similarly to the views held by the general population in Saudi^(2, 25) as well as in other countries⁽¹⁾.

Medical students perceive PwS as being unpredictable, shouting in city streets and being incapable of making their own decisions. Nonetheless, in sharp contrast to the beliefs held by lay people, the majority of students reported that PwS can work and are not dangerous. A possible explanation for this difference between medical students and the general population might lie in the characteristics of the present sample. Medical students were young, they had a high level of education and more than half of them reported knowing someone with serious mental illness. All three variables have been found to constitute correlates of favorable attitudes towards people with mental illness⁽¹⁾. Personal experience of psychiatric disorders in particular increases one's familiarity with mental illness, which in turn leads to decreased level of perceived dangerousness⁽²⁹⁾. This might be a plausible explanation of why the majority of medical students did not perceive PwS as being dangerous. The pattern of results is similar for social distance. Consistent with the findings of the national survey of attitudes towards PwS in Saudi,^(2, 25) the social situations that evoked the most rejecting responses on the part of medical students were those of marrying and sharing a room with a PwS. Many studies have shown that the general population expresses a high degree of desired social distance for social encounters of high intimacy^(3, 30).

It is noteworthy that although the majority of students did not perceive PwS as being dangerous, nonetheless, they would not visit a hairdresser who was afflicted with schizophrenia. This negative reaction might be mediated by endorsement of the unpredictability stereotype. Students might feel wary of exposing themselves to a situation with an ambiguous outcome, not falling in their realm of control. Alternatively, it highlights the importance of bearing in mind social desirability bias when enquiring about beliefs pertaining to PwS. When students were directly asked about PwS being dangerous, they disagreed with the item;

nonetheless, when they were indirectly asked about it via the germane social distance item, they displayed some endorsement of the stereotype. Gender and experience of serious mental illness were the factors that appeared to exert some influence on students' baseline attitudes and desired social distance. Specifically, women appeared slightly more stigmatizing than men, but the differences between the two genders were not substantial. This finding is consistent with other studies that have pointed towards this lack of effect^(30, 31). In contrast, personal experience was found to play a prominent role, especially with regard to social distance scores, in agreement with other studies in the field^(30, 32).

Regarding the second aim of the current study, the undergraduate psychiatric training was found to have either no effect at all, or in a predominantly negative direction. It did improve certain perceptions, but these were positive already (e.g. that schizophrenia is not the outcome of poor parenting and is not a contagious disease). In addition, it did correct to a large extent the misconception stemming from the literal etymology of the word 'schizophrenia' that PwS suffer from split personality. Nonetheless, its impact was predominantly negative. While the majority of students at the beginning of the study endorsed the view that PwS can work and are not dangerous, the majority changed their mind at follow up. Similar aggravations were observed in items addressing the potential of PwS for recovery, their insight into their condition, their ability to make reasonable decisions and their deteriorating course of illness. In addition, the undergraduate training in psychiatry did not succeed in challenging fundamental stereotypes, such as that PwS are a public nuisance (no difference before and after training). Similarly, no differences were seen in social distance items and composite scores as a result of the placement, a finding consistent with other studies on the topic^(15, 23). This is not surprising, given that it follows the worsening of beliefs and attitudes after the training. To explain the absence of a positive impact of the placement, in spite of integrating two of the most effective strategies for fighting stigma and discrimination, that of contact and education⁽²⁴⁾, one should look into the characteristics of the undergraduate psychiatric training course.

The psychiatric placement had a short duration, 4 weeks only, and took place in psychiatric hospitals and psychiatric departments of general hospitals. Students had contact with

patients who were acutely ill or who suffered from serious and chronic psychiatric disorders. As a result of this, they were not given the opportunity to extend their experience of PwS in the context of community or rehabilitation services.

There, medical students would have interacted with PwS who had never been hospitalized and who were successfully treated in the community as well as with patients who continued their treatment outside the hospital. Medical students' one-sided clinical experience may have contributed to the negative influence of the placement, because there is evidence that the acute phase of schizophrenia creates significant stigma, whereas knowledge about after care reduces it⁽³³⁾. For this particular reason it has been suggested that students' experience should not be confined to interacting with inpatients and outpatients, but it should also entail encountering patients who have recovered or are in the process of recovery⁽³⁴⁾. Furthermore, being in close proximity and assuming partial responsibility in such severe cases after only 2 weeks of lectures, might not have allowed sufficient time for medical students to assimilate the information and to acquire the necessary skills for managing these patients. This in turn might have intensified their emotional reactions to PwS, and promoted stigma. Because the curriculum of undergraduate psychiatric training in Saudi did not entail any specific anti-stigma training modules, one could argue that the present findings advocate for incorporation of such an orientation in undergraduate psychiatric training. Future work in this direction might shed light on the significance of such an education. An undergraduate training course in psychiatry that is anti-stigma oriented, might act as an evidence-based anti-stigma intervention that would be embodied in the curriculum and therefore become an integral part of routine teaching in psychiatry.

Such a training course should provide medical students with a well-rounded clinical experience of patients with schizophrenia, while allowing them to observe closely some patients' course of illness from acute treatment to rehabilitation in the community. In addition, prior to bringing into contact medical students with patients, it should allow sufficient time for students to assimilate the information conveyed during lectures and to work on their own emotions about patients. In addition, such a training course should be delivered by mental health professionals who have reflected on their own attitudes towards patients with schizophrenia and who can subsequently relay

positive messages about them in their teaching. Finally, the present study was not without its limitations. The Beliefs and Attitudes section of the instrument was analyzed on an item level, because the reliability analysis and the correlation matrix showed that analysis on a scale level was statistically inappropriate, casting in this way important doubts on the psychometric properties of the particular section. In addition, only medical students from the main medical school in Riyadh were recruited and therefore the findings cannot be extrapolated to all medical students in Saudi. Furthermore, participants were not followed up some years after completion of their medical training to investigate which of these beliefs and attitudes were sustained.

REFERENCES

1. **Angermeyer MC, Dietrich S (2006):** Public beliefs about and attitudes towards people with mental illness: A review of population studies. *Acta Psychiatr. Scand.*, 113: 163-197.
2. **Economou M, Richardson C, Gramandani C, Stalikas A, Stefanis C (2009):** Knowledge about schizophrenia and attitudes towards people with schizophrenia in Greece. *Int. J. Soc. Psychiatry*, 55: 361-371.
3. **Stuart H, Arboleda- Florez J (2001):** Community attitudes toward people with schizophrenia. *Can. J. Psychiatry*, 46: 245-252.
4. **Sartorius N. Stigma (1998):** What can psychiatrists do about it? *Lancet*, 352: 1058-1059.
5. **Lawrie SM, Martin K, McNeil G (1998):** General practitioners' attitudes to psychiatric and medical illness. *Psychol. Med.*, 28: 1463-1467.
6. **Ucok A, Soygur H, Atakli C (2006):** The impact of antistigma education on the attitudes of general practitioners regarding schizophrenia. *Psychiatry Clin. Neurosci.*, 60: 439-443.
7. **Pinfold V, Byrne P, Toumlin H (2005):** Challenging stigma and discrimination in communities: A focus group study identifying UK mental health service users' main campaign priorities. *Int. J. Soc. Psychiatry*, 51: 128-138.
8. **Schulze B, Angermeyer MC (2003):** Subjective experiences of stigma. A focus group study of schizophrenic patients, their relatives and mental health professionals. *Soc. Sci. Med.*, 56: 299-312.
9. **Levinson MC, Druss BG, Dombrowski EA, Rosenheck RA (2003):** Barriers to primary medical care among patients at a community mental health center. *Psychiatr. Serv.*, 54: 1158-1160.
10. **Druss BG, Bradford WD, Rosenheck RA, Radford MJ, Krumholz HM (2001):** Quality of medical care and excess mortality in older patients with mental disorders. *Arch. Gen. Psychiatry*, 58: 565-572.

11. **Harris EC, Barraclough B (1998):** Excess mortality of mental disorder. *Br. J. Psychiatry*, 173: 11-53.
12. **Phelan M, Stradins L, Morrison S (2001):** Physical health of people with severe mental illness. *Br. J. Psychiatry*, 322: 443-444.
13. **General Medical Council (1993):** Tomorrow's Doctors: Recommendations on Undergraduate Medical Education. Available at: https://www.gmc-uk.org/Tomorrow_s_Doctors_1214.pdf 48905759.pdf.
14. **Byrne P (1999):** Stigma of mental illness: Changing minds, changing behaviour. *Br. J. Psychiatry*, 174: 1-2.
15. **Arkar H, Eker D (1997):** Influence of a 3-week psychiatric training programme on attitudes toward mental illness in medical students. *Soc. Psychiatry Psychiatr. Epidemiol.*, 32: 171-176.
16. **Mino Y, Yasuda N, Tsuda T, Shimodera S (2001):** Effects of a one-hour educational program on medical students' attitudes to mental illness. *Psychiatry Clin. Neurosci.*, 26: 178-181.
17. **Mukherjee R, Fialho A, Wijetunge A, Checinski K, Surgenor T (2002):** The stigmatization of psychiatric illness: The attitudes of medical students and doctors in a London teaching hospital. *Psychiatr. Bull.*, 26: 178-181.
18. **Maidment R, Livingston G, Katona C, McParland M, Noble L (2004):** Change in attitudes to psychiatry and intention to pursue psychiatry as a career in newly qualified doctors: A follow-up of two cohorts of medical students. *Med. Teach.*, 26: 565-569.
19. **Gray AJ (2002):** Stigma in psychiatry. *J. R. Soc. Med.*, 95: 72-76.
20. **Mino Y, Yasuda N, Kanazawa S, Inoue S (2000):** Effects of medical education on attitudes towards mental illness among medical students: A five-year follow-up study. *Acta Med. Okayama*, 54: 127-132.
21. **Reddy JP, Tan SMK, Azmi MT (2005):** The effect of a clinical posting in psychiatry on the attitudes of medical students towards psychiatry and mental illness in a Malaysian Medical School. *Ann. Acad. Med. Singapore*, 34: 505-510.
22. **Singh SW, Baxter H, Standen P, Duggan C (1998):** Changing the attitudes of 'tomorrow's doctors' towards mental illness and psychiatry: A comparison of two teaching methods. *Med. Educ.*, 32: 115-120.
23. **Pillai SK, Jesjeet SG, Jambunathan ST (2006):** Psychiatric posting in final year medical students: Do attitudes change? *Malays. J. Psychiatry*, 15: 26-34.
24. **Corrigan PW, River LP, Lundin RK (2001):** Three strategies for changing attributions about severe mental illness. *Schizophr. Bull.*, 27: 187-195.
25. **Economou M, Gramandani C, Eustathiou G, Stefanis C (2005):** Public attitudes towards people with schizophrenia in Greece. *World Psychiatry*, 4: 40-44.
26. **Thompson AH, Stuart H, Bland RC (2002):** Attitudes about schizophrenia from the pilot site of the WPA worldwide campaign against the stigma of schizophrenia. *Soc. Psychiatry Psychiatr. Epidemiol.*, 37: 475-482.
27. **Gaebel W, Baumann AE (2003):** Interventions to reduce the stigma associated with severe mental illness: Experiences from the Open the Doors Program in Germany. *Can. J. Psychiatry*, 48: 657-662.
28. **Economou M, Peppou LE, Louki E (2010):** Social Distance Scale: Greek adaptation and psychometric properties. *Psychiatrike*, 21: 217-225.
29. **Corrigan PW, Green A, Lundin R, Kubiak MA, Penn DL (2001):** Familiarity with and social distance from people who have serious mental illness. *Psychiatr. Serv.*, 52: 953-958.
30. **Jorm AF, Oh E (2009):** Desire for social distance from people with mental disorders: A review. *Aust. N. Z. J. Med.*, 43: 183-200.
31. **Schnittker J (2000):** Gender and reactions to psychological problems: An examination of social tolerance and perceived dangerousness. *J. Health Soc. Behav.*, 44: 224-240.
32. **Angermeyer MC, Matshinger H (1996):** The effect of personal experience with mental illness on the attitude towards individuals suffering from mental disorders. *Soc. Psychiatry Psychiatr. Epidemiol.*, 31: 321-326.
33. **Penn DL, Guynan K, Daily T, Spaulding WD, Garbin CP, Sullivan M (1994):** Dispelling the stigma of schizophrenia: What sort of information is best? *Schizophr. Bull.*, 20: 567-578.
34. **Llerena A, Caceres MC, Penas-Leledo EM (2002):** Schizophrenia stigma among medical and nursing undergraduates. *Eur. Psychiatry*, 17: 298-299.