

The Effect of Clinical Exposure to Patients on Medical Students' Attitude Towards Mental Illness

Homayoun Amini,^{1,2,*} Saeed Shoar,³ Maryam Tabatabaee,¹ and Somaye Arabzadeh¹

¹Department of Psychiatry, Tehran University of Medical Sciences, Tehran, IR Iran

²Psychosomatic Research Centre, Tehran University of Medical Sciences, Tehran, IR Iran

³Department of Surgery, Shariati Hospital, Tehran University of Medical Sciences, Tehran, IR Iran

*Corresponding author: Homayoun Amini, Department of Psychiatry, Roozbeh Hospital, Tehran University of Medical Sciences, Tehran, IR Iran. Tel: +98-2155412222, Fax: +98-2155419113, E-mail: aminihom@tums.ac.ir

Received 2015 April 09; Revised 2015 August 10; Accepted 2016 April 09.

Abstract

Background: Stigma of mental disorders causes a reduction in seeking help from the health care professionals and is evident across the world.

Objectives: The current study aimed to compare medical students' attitude towards mental illness after two different psychiatry clerkships in terms of the level of clinical exposure to patients with mental illness.

Patients and Methods: Through a quasi-experimental study, all of the 4th-year medical students were invited to enroll this study conducted in Tehran University of Medical Sciences (TUMS). They were non-randomly assigned into two different psychiatry clerkships from January 2009 to January 2010. One group was enrolled in the traditional lecture-based course (low-exposure) while the second group participated in a novel method with increased hours of patient exposure (high-exposure). Attitude towards mental illness (AMI) was measured by a 22-item questionnaire before and after the clerkship and data were compared between the two groups in terms of changing attitude towards mental illness in five different categories.

Results: A total of 211 participants were enrolled in the study (115 female) of which 115 students (54.5%) were in low-exposure group and 96 students (45.5%) in the high-exposure group. Generally, AMI scores did not differ between the two groups and did not show any significant changes before and after the psychiatry clerkship. The only exceptions to this were AMI4 category (the concept of etiology of the mental illness), which significantly improved after the clerkship in the low-exposure ($P = 0.011$) and the high-exposure groups ($P = 0.024$), respectively.

Conclusions: Exposure of medical students to patients with mental illness did not improve attitude towards mental illness and psychiatric conditions.

Keywords: Attitude, Exposure to Patients with Mental Illness, Health Personnel, Medical Students: Mental Disorders

1. Background

Stigma of mental disorders causes a reduction in seeking help from the health care professionals (1) and is evident across the world (2). According to Sartorius, stigma constitutes the most important obstacle to progress in the development of mental health care (3, 4). Stigmatizing attitude is also present among different health care professionals (5-7) and a label of mental illness can produce a negative attitude in medical students (8). Negative attitude can in turn cause low attention to patients' medical needs, unnecessary referral to a highly specialized care center, mismanagement of patients with mental illness, and even the lack of acceptance and support in the social and personal life (9-11). Welch et al. showed that physicians' negative attitudes toward patients with schizophrenia alter patient doctor interaction, therefore affect clinical manage-

ment of chronic illness qualitatively (12).

The negative attitude can occur in association with a poor understanding of psychiatric disorders as conditions with no cure. Furthermore, negative attitude can result in inattention to psychological symptoms and misunderstanding them with somatic complaints. Formation of unconstructive attitude toward mental illness during medical college and stigma attached to mental disorder can exacerbate cultural effects embedded in each nation (9, 13-17). There have been attempts in the literature to reduce the stigmatizing belief. Engagement in a close relationship with patients with mental illness reduces the stigma and the desire to be distant from them, while some stereotypical thinking such as considering patients with mental illness as dangerous has opposite effect (18). Psychiatric education can further decrease the stigma (19). Social contact

with patients with mental illness may reduce the stigmatizing thought (20).

According to these findings, it is expectable that more clinical contact with patients with mental illness causes more decrease in stigmatizing attitude in health professional personnel.

2. Objectives

The present study aimed to compare medical students' attitude towards mental illness between two different psychiatry clerkships with different levels of clinical exposure to patients with mental illness.

3. Patients and Methods

In a quasi-experimental study, all of the 4th-year medical students attending psychiatry clerkship were invited to enroll in the current study conducted in Tehran University of Medical Sciences (TUMS), the largest medical school in Iran. Due to limitations of the local education regulations, the authors could not randomly allocate each student to a group; it would be only permitted to assign a cohort of students who entered psychiatry clerkship to one of the two groups. Across two consecutive semesters, two cohorts of students were non-randomly assigned to either a traditional low-exposure clerkship or a new clerkship with high level of exposure to patients with mental illness from January 2009 to January 2010. At the end of the semester, the students were evaluated for their knowledge, skills, and attitudes towards mental illness.

The traditional clerkship consisted of lecture-based teaching of theoretical psychiatry during a semester and 4-week training in outpatient clinics and psychiatric wards in Roozbeh hospital, a teaching mental hospital affiliated to TUMS. Main changes that took place in the new psychiatry clerkship included: 1- Integration of the clinical clerkship with education of the theoretical psychiatry in a 4-week course. Conversely, didactic lectures and the rotation of 4-week clerkship were not simultaneous in the old psychiatry clerkship; 2- Increasing the clinical encounter in outpatient clinics in the new clerkship two times more than the traditional one indicating that in the new clerkship, students spent two days of each week in inpatient services, three days in the outpatient clinic, and one day in the hospital emergency room.

The students were asked to fill out a two-part questionnaire in the first and the last three days of their rotation. The study aim and the confidentiality of information were declared and assured to each individual. The participation was voluntary. The questionnaire was anonymous and had

no effect on the student's clerkship evaluation score. The first part of the questionnaire collected demographic and basic information about the participants while the second part (22 questions) measured the attitude towards mental illness (AMI). The questionnaire was adapted from two questionnaires used in other studies in Iran (21-24). The second part was divided into five categories:

1. Questions on attitude towards social relationships (six questions) (AMI1).

2. Questions on the tendency to inform others in case oneself or one of the close relatives are mentally ill (three questions) (AMI2).

3. Questions on the concept of treating patients (six questions) (AMI3).

4. Questions on the concept of etiology of the mental illness (three questions) (AMI4).

5. Questions on the stereotyped attitude towards mental illness (four questions) (AMI5).

The scoring was based on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree), giving an average score of 66. A higher score in this 5-point scale indicates a more favorable attitude towards mental illness. To establish content validity, the questions were adapted based on the opinions of five experts (a clinical psychologist and four psychiatrists) and adjusted in terms of social and cultural circumstances. In order to examine the reliability, the questionnaire was distributed to 70 students and handed out again after two weeks. The Cronbach's alpha ranged from 0.603 to 0.857 across categories. The data were analyzed by statistical package for the social science (SPSS, version 16, Chicago, Inc.). The paired t-test or Wilcoxon test was applied to compare the attitudes before and after the clerkship. Unpaired t-test, Mann-Whitney U test, and Chi-square test were also used to compare the other variables between the two groups.

4. Results

A total of 211 students participated in the study. Of these 115 (54.5%) were assigned into the old low-exposure clerkship and 96 participants (45.5%) were trained in the new high-exposure clerkship. The low-exposure group consisted of 72 females (62.6%) and 43 males (37.4%) with an average age of 23.02 ± 1.86 years. The high-exposure group consisted of 43 females (45.3%) and 52 males (54.7%) with an average age of 22.70 ± 1.24 . Eighty of the low-exposure clerkship students (69.6%) and 71 of the high-exposure clerkship students (74%) responded to the questionnaires, before and after the clerkship, respectively. No significant differences were observed between the two groups in terms of mean age ($t = 1.43$, $df = 204$, $P > 0.05$). The gender distribution was significantly different between the two

groups (Chi-square = 6.32, df = 1, P = 0.012). However, the correlation between gender and AMI total score or those of each of the AMI dimensions was not statistically significant ($P > 0.05$).

To determine the normality of data distribution, Kolmogorow-Simirnow test (K-S test) was conducted. Since the distributions of AMI scores were not normal in most of them, non-parametric techniques in analyses were employed. An AMI total score above 66 was considered neutral. In the current study, 92.5% of the low-exposure clerkship and 91.5% of the high-exposure clerkship participants obtained a before-training score above 66. The after-training AMI total scores were above 66 in 92.5% of the low-exposure group and 95.8% of the high-exposure group. The AMI total scores were not different across the two groups and did not change with training ($P > 0.05$).

In terms of AMI scores in each specific category, there was no statistically significant difference between scores before and after the psychiatry clerkship (Tables 1 and 2). Also, there was no significant difference between the two groups in terms of changes in AMI scores with training (Table 3). The only exception was AMI4 category (the concept of etiology of the mental illness) which improved significantly in both groups after completing the clerkship. The AMI4 score changes after the clerkship did not reveal significant differences between the two groups.

5. Discussion

The current study incorporated a new psychiatry clerkship for the 4th-year medical students, in which exposure to patients with psychiatric disorder increased up to 50% compared to that of the traditional clerkship. The high-exposure group did not show any improvement in their attitude towards mental illness even when the students spent 50% of their time during clerkship on patient diagnosis or management.

These findings suggest that increasing clinical exposure of medical students does not necessarily affect their attitude towards mental illness. This is in contrast with previous studies suggesting that direct or video-based social contact interventions are the most effective strategy to improve attitudes of general population towards mental illness and diminishing the desire for social distance (25-31). On the other hand, they are consistent with a report which showed that this method has no influence on medical students' attitude (25). One explanation for this inconsistency may be due to the different populations of each study i.e, medical students compared to the general population. Moreover, in the current study, students' attitude towards mental illness was assessed by a questionnaire and this may be the reason for different outcomes.

A recent study showed that although exposure to mentally ill patients decreases the negative explicit attitude of health care professionals, it does not necessarily improve negative implicit attitudes (32). Surprisingly, neither the old nor the new clerkship improved the medical students' attitude towards mental illness. It was consistent with previous studies where various educational methods had little effect on students' attitude (26, 33-39). The fact that psychiatry clerkship had no favorable effects on the attitude of medical students' toward mental illness maybe associated with multiple factors such as the stress related to the atmosphere of psychiatry clerkship (40); however, previous research suggests that the effect of contact seems to be greater than that of education to modulate the stigma (41).

5.1. Category One (Social Relationships with People Affected by Mental Illness)

In the current study, training improved the attitude of about one third of the students in terms of close relationship with patients with mental illness. Although, considering all students, there were no significant changes in AMI scores with training or across the two groups. Adewuya et al. (42) showed that a minority of students are willing to be in close contact with patients with mental illness either in a team work or as a roommate. Mino et al. (11) also found favorable attitudes from students for social relationships with people affected by mental illness. Intervention films significantly improve general attitudes toward serious mental illness and social distance, while these effects appeared to be smaller during the students' clinical enrollment (14). It is consistent with the current study findings that the scores of category one did not change with either training method. This is in spite of the fact that the baseline AMI1 scores were slightly lower than the neutral score and hence expected to increase with exposure during education.

5.2. Category Two (Willingness to Self-Disclosure Regarding Mental Illness)

The current study found that exposure to the status of patients' management did not improve the sense of shame about mental illness of oneself or one's close relatives. This finding was in contrast to those of several other studies in favor of the effect of educational interventions on medical students, and other health care personnel (11, 36, 42-47). However there was no consensus on this issue throughout the literature (41). Evans et al. (48) showed that increasing social contact with patients with mental illness can improve the stigma related behavior but has no significant effect on willingness to disclosure. The insignificant effects of patient exposure for both teaching methods

Table 1. AMI Categories Scores in the Old Low-Exposure Group Before and After the Psychiatry Clerkship

AMI Categories	Before Clerkship (Mean \pm SD)	After Clerkship (Mean \pm SD)	Negative Rank	Positive Rank	Ties	Z	P Value
AMI 1 Score (neutral score, 18)	19.51 \pm 3.99	20.17 \pm 4.06	39	34	17	-0.931	0.352
AMI 2 Score (neutral score, 9)	10.59 \pm 4.71	10.50 \pm 1.92	37	27	27	-1.27	0.203
AMI 3 Score (neutral score, 18)	21.36 \pm 2.50	21.41 \pm 2.83	34	39	16	-0.817	0.414
AMI 4 Score (neutral score, 9)	10.69 \pm 1.90	10.23 \pm 1.57	24	43	24	-2.52	0.011 ^a
AMI 5 Score (neutral score, 12)	16.46 \pm 1.94	16.41 \pm 2.26	33	33	24	-0.116	0.907
Total AMI score (neutral score, 66)	78.51 \pm 9.40	78.58 \pm 7.88	39	38	3	-0.287	0.774

Abbreviation: AMI, attitude toward mental illness.

^aSignificant.**Table 2.** AMI Categories in the New High-Exposure Group Before and After the Psychiatry Clerkship

AMI Categories	Before Clerkship	After Clerkship	Negative Rank	Positive Rank	Ties	Z	P Value
AMI 1 Score (neutral score, 18)	19.46 \pm 3.99	20.02 \pm 3.82	34	39	1	-1.42	0.155
AMI 2 Score (neutral score, 9)	10.01 \pm 2.45	10.29 \pm 2.36	39	27	14	-1.83	0.067
AMI 3 Score (neutral score, 18)	21.60 \pm 2.22	21.34 \pm 2.13	31	35	13	-0.79	0.431
AMI 4 Score (neutral score, 9)	10.97 \pm 1.67	10.54 \pm 1.65	22	37	22	-2.25	0.024 ^a
AMI 5 Score (neutral score, 1)	16.13 \pm 2.41	16.66 \pm 2.02	39	23	17	-1.82	0.068
Total AMI score (neutral score, 66)	78.11 \pm 8.59	79.17 \pm 8.64	37	29	5	-1.13	0.258

Abbreviation: AMI, attitude toward mental illness.

^aSignificant.**Table 3.** Changes of AMI Categories Scores After Psychiatry Clerkship Between the Old Low-Exposure and the New High-Exposure Group

AMI Categories	Mean \pm SD	Z	P Value
AMI 1 Score	0.0421 \pm 0.19	-0.305	0.761
AMI 2 Score	0.0618 \pm 0.26	-0.583	0.560
AMI 3 Score	0.0031 \pm 0.13	-0.212	0.832
AMI 4 Score	0.0258 \pm 0.17	-0.174	0.862
AMI 5 Score	0.0312 \pm 0.17	-1.700	0.089
Total AMI score	0.0112 \pm 0.10	-1.124	0.261

could also result from the fact that most of the students in the study already had a high acceptance of such circumstances.

5.3. Category Three (Treatment of Mental Illness)

The current study found that the attitudes of the majority of the students towards treatment of mental illness

did not change by enrolling in psychiatry clerkship. In fact, the attitude of several students improved while the attitude of others was negatively altered. Similar findings are also reported by other studies (11, 42). The question remains as to what other methods can help correct the misconceptions of future generation of medical doctors towards the availability of treatment for mental illness.

5.4. Category Four (the Etiology of Mental Illness)

Medical students' perception of mental illness and its etiology were the items that showed significant improvement by psychiatry clerkship itself. It was true both for the low-exposure and the high-exposure clerkship, with no significant differences between the two groups. Previous studies also reported such misconceptions by medical students regarding the etiology of mental illness (42, 49). Consistent with these results, while education through a psychiatry clerkship increased understanding of mental illness etiology, it did not improve the social acceptance for mental illness (50).

5.5. Category Five (Stereotypic Attitude Toward People With Mental Illness)

Despite the fact that all the students in the study were trained in a mental hospital, the psychiatry clerkship did not improve the students' misconception that people with mental disorders could be treated and managed inside the community. While Mino et al. (11) showed similar findings, other authors reported that medical students consider patients with mental illness as a threat to the society (42, 49).

The attitudes of medical students are formed as the results of interactions between multiple factors including academic environment (51), sociocultural circumstances (31), individual experiences (52), and methods of teaching (clerkship). Psychiatry clerkship is often perceived as a critical factor that shapes the physicians' attitude toward patients with mental illness. However, the study questions the effectiveness of these clerkships in improving medical students' more positive attitudes towards mental illness. However, there is controversy surrounding the evidence in this field that make it difficult to improve methods and the contents of the clerkships and to answer why the same method does not work in the same way in all circumstances. This may also happen as a result of different methods of teaching and differences in what a patient exposure could mean (being independent in survey, being an assistant to the upper level trainees, or just acting as an observer). However, many studies showed the effectiveness of social contact in reducing the stigma, the effect of formal contact via clinical exposure must be further investigated.

The differences between the two corresponding AMI scores in the various categories were too small, about one score or less. It means that the differences between groups were not practically significant and had no importance in term of decision-making utility. Unfavorable changes in students' attitudes toward mental illness could be due to the fact that the current patients' exposure method is not effective in educational setting and other methods may work better. One limitation of the study was the assessment protocol which relied on questionnaires to investigate the students' attitude and how it changes with training. Assessing attitude by a formal questionnaire may reveal different outcomes with the attitude in professional career. Although the clinical encounter was doubled in outpatient clinics in the new psychiatry clerkship it may be still inadequate to affect students' attitude. Another limitation of the study was non-random allocation of students to each group. Inadequate statistical power due to the small sample size was one of the limitations of the study. In the present study, most of the students already had favorable attitudes towards mental illness which might dilute the improving effect of the exposure approach.

In conclusion, the present study showed that employing a new psychiatry clerkship by increasing the exposure level of medical students to patients with mental illness could not improve the negative attitude toward mental illness. With regard to the highly favorable attitudes of the medical students toward mental illness prior to the clerkship, the effect of educational methods on changing attitudes could not be well explained. This highly favorable attitude which was observed in the current study raised the question whether the explicit and implicit attitudes of the medical students are the same. Further studies by larger samples of students and a real time measurement system are needed to distinguish between the real attitude and the conceived one.

Acknowledgments

Authors would like to thank the medical students contributed to this study.

Footnotes

Authors' Contribution: Homayoun Amini and Maryam Tabatabaee conceived and designed the evaluation and collected the clinical data. Homayoun Amini performed the statistical analysis. Homayoun Amini, Saeed Shoar, Maryam Tabatabaee, and Somaye Arabzadeh interpreted the clinical data. Saeed Shoar drafted the manuscript. Homayoun Amini, Maryam Tabatabaee, and Somaye Arabzadeh revised it critically for important intellectual content. All of the authors read and approved the final manuscript..

Financial Disclosure: None declared.

Funding/Support: None declared.

References

1. Thornicroft G. Stigma and discrimination limit access to mental health care. *Epidemiol Psychiatr Soc.* 2008;**17**(1):14-9. [PubMed: 18444452].
2. Angermeyer MC, Dietrich S. Public beliefs about and attitudes towards people with mental illness: a review of population studies. *Acta Psychiatr Scand.* 2006;**113**(3):163-79. doi: 10.1111/j.1600-0447.2005.00699.x. [PubMed: 16466402].
3. Sartorius N. Iatrogenic stigma of mental illness. *BMJ.* 2002;**324**(7352):1470-1. [PubMed: 12077020].
4. Sartorius N. Lessons from a 10-year global programme against stigma and discrimination because of an illness. *Psychol Health Med.* 2006;**11**(3):383-8. doi: 10.1080/13548500600595418. [PubMed: 17130075].
5. Chambers M, Guise V, Valimaki M, Botelho MA, Scott A, Staniulienė V, et al. Nurses' attitudes to mental illness: a comparison of a sample of nurses from five European countries. *Int J Nurs Stud.* 2010;**47**(3):350-62. doi: 10.1016/j.ijnurstu.2009.08.008. [PubMed: 19804882].

6. Hugo M. Mental health professionals' attitudes towards people who have experienced a mental health disorder. *J Psychiatr Ment Health Nurs*. 2001;**8**(5):419-25. [PubMed: [11882162](#)].
7. Nordt C, Rossler W, Lauber C. Attitudes of mental health professionals toward people with schizophrenia and major depression. *Schizophr Bull*. 2006;**32**(4):709-14. doi: [10.1093/schbul/sbj065](#). [PubMed: [16510695](#)].
8. Ogunsemi OO, Odusan O, Olatawura MO. Stigmatising attitude of medical students towards a psychiatry label. *Ann Gen Psychiatry*. 2008;**7**:15. doi: [10.1186/1744-859X-7-15](#). [PubMed: [18724873](#)].
9. Jugal K, Mukherjee R, Parashar M, Jiloha RC, Ingle GK. Beliefs and attitudes towards mental health among medical professionals in Delhi. *Indian J Community Med*. 2007;**32**:198-200. doi: [10.4103/0970-0218.36827](#).
10. Kleinman A, Cohen A. Psychiatry's global challenge. *Sci Am*. 1997;**276**(3):86-9. [PubMed: [9046110](#)].
11. Mino Y, Yasuda N, Tsuda T, Shimodera S. Effects of a one-hour educational program on medical students' attitudes to mental illness. *Psychiatry Clin Neurosci*. 2001;**55**(5):501-7. doi: [10.1046/j.1440-1819.2001.00896.x](#). [PubMed: [11555346](#)].
12. Welch LC, Litman HJ, Borba CP, Vincenzi B, Henderson DC. Does a physician's attitude toward a patient with mental illness affect clinical management of diabetes? Results from a mixed-method study. *Health Serv Res*. 2014;**50**(4) doi: [10.1111/1475-6773.12267](#).
13. Buchanan A, Bhugra D. Attitude of the medical profession to psychiatry. *Acta Psychiatr Scand*. 1992;**85**(1):1-5. [PubMed: [1546540](#)].
14. Kerby J, Calton T, Dimambro B, Flood C, Glazebrook C. Anti-stigma films and medical students attitudes towards mental illness and psychiatry: randomised controlled trial. *Psychiatr Bull*. 2008;**32**(9):345-9. doi: [10.1192/pb.bp.107.017152](#).
15. Lawrie SM, Martin K, McNeill G, Drife J, Chrystie P, Reid A, et al. General practitioners' attitudes to psychiatric and medical illness. *Psychol Med*. 1998;**28**(6):1463-7. [PubMed: [9854287](#)].
16. Mino Y, Kodera R, Bebbington P. A comparative study of psychiatric services in Japan and England. *Br J Psychiatry*. 1990;**157**:416-20. [PubMed: [2245274](#)].
17. Salokangas RK, Der G, Wing JK. Community psychiatric services in England and Finland. *Soc Psychiatry*. 1985;**20**(1):23-9. [PubMed: [3975768](#)].
18. Covarrubias I, Han M. Mental health stigma about serious mental illness among MSW students: social contact and attitude. *Soc Work*. 2011;**56**(4):317-25. [PubMed: [22308664](#)].
19. Papish A, Kassam A, Modgill G, Vaz G, Zanussi L, Patten S. Reducing the stigma of mental illness in undergraduate medical education: a randomized controlled trial. *BMC Med Educ*. 2013;**13**:141. doi: [10.1186/1472-6920-13-141](#). [PubMed: [24156397](#)].
20. Ando S, Yamaguchi S, Aoki Y, Thornicroft G. Review of mental-health-related stigma in Japan. *Psychiatry Clin Neurosci*. 2013;**67**(7):471-82. doi: [10.1111/pcn.12086](#). [PubMed: [24118217](#)].
21. Cohen J, Struening EL. Opinions about mental illness in the personnel of two large mental hospitals. *J Abnorm Soc Psychol*. 1962;**64**:349-60. [PubMed: [13880267](#)].
22. Crocetti G, Spiro HR, Siassi I. Are the ranks closed? Attitudinal social distance and mental illness. *Am J Psychiatry*. 1971;**127**(9):1121-7. doi: [10.1176/ajp.127.9.1121](#). [PubMed: [5100602](#)].
23. Ghasemi A, Fatemi MM. The effect of an educational film on the attitudes of mentally ill patients' families toward mental illness [in Persian]. Tehran: Tehran University of Medical Sciences; 1999.
24. Amini H, Majdzadeh R, Eftekhari-Ardebili H, Shabani A, Davari-Ashtiani R. How Mental Illness is Perceived by Iranian Medical Students: A Preliminary Study. *Clin Pract Epidemiol Ment Health*. 2013;**9**:62-8. doi: [10.2174/1745017901309010062](#). [PubMed: [23878611](#)].
25. Yamaguchi S, Wu SI, Biswas M, Yate M, Aoki Y, Barley EA, et al. Effects of short-term interventions to reduce mental health-related stigma in university or college students: a systematic review. *J Nerv Ment Dis*. 2013;**201**(6):490-503. doi: [10.1097/NMD.0b013e31829480df](#). [PubMed: [23719324](#)].
26. Arkar H, Eker D. Influence of a 3-week psychiatric training programme on attitudes toward mental illness in medical students. *Soc Psychiatry Psychiatr Epidemiol*. 1997;**32**(3):171-6. [PubMed: [9130870](#)].
27. Desforages DM, Lord CG, Ramsey SL, Mason JA, Van Leeuwen MD, West SC, et al. Effects of structured cooperative contact on changing negative attitudes toward stigmatized social groups. *J Pers Soc Psychol*. 1991;**60**(4):531-44. [PubMed: [2037965](#)].
28. Peterson CL. Changing community attitudes toward the chronic mentally ill through a psychosocial program. *Hosp Community Psychiatry*. 1986;**37**(2):180-2. [PubMed: [3943810](#)].
29. Trute B, Tefft B, Segall A. Social rejection of the mentally ill: a replication study of public attitude. *Soc Psychiatry Psychiatr Epidemiol*. 1989;**24**(2):69-76. [PubMed: [2499055](#)].
30. Rabkin JG. Opinions about mental illness: a review of the literature. *Psychol Bull*. 1972;**77**(3):153-71. [PubMed: [4554059](#)].
31. Kelly B, Raphael B, Byrne G. The evaluation of teaching in undergraduate psychiatric education: students' attitudes to psychiatry and the evaluation of clinical competency. *Med Teach*. 1991;**13**(1):77-87. [PubMed: [1865804](#)].
32. Kopera M, Suszek H, Bonar E, Myszkla M, Gmaj B, Ilgen M, et al. Evaluating explicit and implicit stigma of mental illness in mental health professionals and medical students. *Community Ment Health J*. 2014;**51**(5):628-34. doi: [10.1007/s10597-014-9796-6](#).
33. Eker D. Attitudes of Turkish and American clinicians and Turkish psychology students toward mental patients. *Int J Soc Psychiatry*. 1985;**31**(3):223-9. [PubMed: [4044157](#)].
34. Arkar H, Eker D. Influence of having a hospitalized mentally ill member in the family on attitudes toward mental patients in Turkey. *Soc Psychiatry Psychiatr Epidemiol*. 1992;**27**(3):151-5. [PubMed: [1621141](#)].
35. Furnham A, Bower P. A comparison of academic and lay theories of schizophrenia. *Br J Psychiatry*. 1992;**161**:201-10. [PubMed: [1521103](#)].
36. Malla A, Shaw T. Attitudes towards mental illness: the influence of education and experience. *Int J Soc Psychiatry*. 1987;**33**(1):33-41. [PubMed: [3583603](#)].
37. Rabkin JG. Who is called mentally ill: public and professional views. *J Community Psychol*. 1979;**7**(3):253-8.
38. Sellick K, Goodear J. Community attitudes toward mental illness: the influence of contact and demographic variables. *Aust N Z J Psychiatry*. 1985;**19**(3):293-8. [PubMed: [3866571](#)].
39. Galletly CA, Schrader GD, Chesterman HM, Tsourtos G. Medical student attitudes to psychiatry: lack of effect of psychiatric hospital experience. *Med Educ*. 1995;**29**(6):449-51. [PubMed: [8594410](#)].
40. Pessar LF, Pristach CA, Leonard KE. What troubles clerks in psychiatry? A strategy to explore the question. *Acad Psychiatry*. 2008;**32**(3):194-8. doi: [10.1176/appi.ap.32.3.194](#). [PubMed: [18467475](#)].
41. Corrigan PW, Fong MW. Competing perspectives on erasing the stigma of illness: what says the dodo bird?. *Soc Sci Med*. 2014;**103**:110-7. doi: [10.1016/j.socscimed.2013.05.027](#). [PubMed: [23787069](#)].
42. Adewuya AO, Oguntade AA. Doctors' attitude towards people with mental illness in Western Nigeria. *Soc Psychiatry Psychiatr Epidemiol*. 2007;**42**(11):931-6. doi: [10.1007/s00127-007-0246-4](#). [PubMed: [17721670](#)].
43. Ay P, Save D, Fidanoglu O. Does stigma concerning mental disorders differ through medical education? A survey among medical students in Istanbul. *Soc Psychiatry Psychiatr Epidemiol*. 2006;**41**(1):63-7. doi: [10.1007/s00127-005-0994-y](#). [PubMed: [16328750](#)].
44. Baxter H, Singh SP, Standen P, Duggan C. The attitudes of 'tomorrow's doctors' towards mental illness and psychiatry: changes during the final undergraduate year. *Med Educ*. 2001;**35**(4):381-3. [PubMed: [11319003](#)].
45. Mino Y, Yasuda N, Kanazawa S, Inoue S. Effects of medical education on attitudes towards mental illness among medical students: a five-year follow-up study. *Acta Med Okayama*. 2000;**54**(3):127-32. [PubMed: [10925737](#)].

46. Chung KF, Chen EY, Liu CS. University students' attitudes towards mental patients and psychiatric treatment. *Int J Soc Psychiatry*. 2001;**47**(2):63-72. [PubMed: [11434412](#)].
47. Dalky HF. Mental illness stigma reduction interventions: review of intervention trials. *West J Nurs Res*. 2012;**34**(4):520-47. doi: [10.1177/0193945911400638](#). [PubMed: [21389251](#)].
48. Evans-Lacko S, London J, Japhet S, Rusch N, Flach C, Corker E, et al. Mass social contact interventions and their effect on mental health related stigma and intended discrimination. *BMC Public Health*. 2012;**12**:489. doi: [10.1186/1471-2458-12-489](#). [PubMed: [22742085](#)].
49. Al-Adawi S, Dorvlo AS, Al-Ismaily SS, Al-Ghafry DA, Al-Noobi BZ, Al-Salmi A, et al. Perception of and attitude towards mental illness in Oman. *Int J Soc Psychiatry*. 2002;**48**(4):305-17. [PubMed: [12553410](#)].
50. Schomerus G, Schwahn C, Holzinger A, Corrigan PW, Grabe HJ, Carta MG, et al. Evolution of public attitudes about mental illness: a systematic review and meta-analysis. *Acta Psychiatr Scand*. 2012;**125**(6):440-52. doi: [10.1111/j.1600-0447.2012.01826.x](#). [PubMed: [22242976](#)].
51. Weissman SH, Haynes RA, Killian CD, Robinowitz C. A model to determine the influence of medical school on students' career choices: psychiatry, a case study. *Acad Med*. 1994;**69**(1):58-9. [PubMed: [8286002](#)].
52. Tesser A. The importance of heritability in psychological research: the case of attitudes. *Psychol Rev*. 1993;**100**(1):129-42. [PubMed: [8426878](#)].