

The effect of classroom lectures and a movie recommendation on pharmacy students' attitudes and social distancing toward people with schizophrenia

Deborah Oyine Aluh, MPharm¹

Kosisochi Chinwendu Amorha, PhD, FPCPharm²

Temitayo Adeola Anthony-Awi³

How to cite: Aluh DO, Amorha KC, Anthony-Awi TA. The effect of classroom lectures and a movie recommendation on pharmacy students' attitudes and social distancing toward people with schizophrenia. *Ment Health Clin* [Internet]. 2022;12(1):23-31. DOI: 10.9740/mhc.2022.01.023.

Submitted for Publication: February 13, 2021; **Accepted for Publication:** December 15, 2021

Abstract

Introduction: Stigma and negative attitudes toward people with mental health disorders can impair the provision of pharmaceutical care. The purpose of the study was to assess the effect of classroom lectures on mental health disorders and a movie recommendation on pharmacy students' attitudes and stigma toward persons with schizophrenia (PwS).

Methods: The study consisted of a presurvey and postsurvey carried out among final-year pharmacy students of the University of Nigeria Nsukka. A survey comprising 3 sections on sociodemographic details, attitudes toward PwS, and a social distance scale was given to conveniently sampled students before and after lectures on schizophrenia. Students were encouraged to watch a movie about the experiences of a PwS after the first lecture.

Results: One hundred seventy-nine students (of the 200 sampled, response rate 91.1%) agreed to participate and completed the survey instrument before the clinical lecture, whereas 108 students who took part in the presurvey participated in the postsurvey (response rate of 76.0%). The overall mean negative attitude score reduced from 2.79 ± 0.412 to 2.72 ± 0.357 . The overall mean social distance score increased from 2.48 ± 0.415 to 2.49 ± 0.467 , indicating increased stigma. In both presurveys and postsurveys, people with a friend or relative with schizophrenia had a lower mean negative attitude score compared with those who did not. People who had watched the movie recommendation ($n=85$) had a higher mean negative attitude (2.74 vs 2.67 , $P=.433$) and a lower social distance toward PwS (2.57 vs 2.48 , $P=.415$).

Discussion: Classroom lectures on mental health among pharmacy students might not significantly improve the overall attitudes and social distance toward PwS. Schools of pharmacy should consider alternative formats of teaching mental health-related topics, such as contact with real patients and simulation.

Keywords: schizophrenia, stigma, pharmacy students, movie, Nigeria, social distance

¹ (Corresponding author) Lecturer, Department of Clinical Pharmacy and Pharmacy Management, Faculty of Pharmaceutical Sciences, University of Nigeria Nsukka, Nsukka, Enugu State, aluhdeborah@yahoo.com, ORCID: <https://orcid.org/0000-0001-6939-5547>; ² Lecturer, Department of Clinical Pharmacy and Pharmacy Management, Faculty of Pharmaceutical Sciences, University of Nigeria Nsukka, Nsukka, Enugu State, ORCID:

<https://orcid.org/0000-0003-0131-440X>; ³ Undergraduate Student, College of Medicine, Faculty of Clinical Sciences, University of Lagos, Akoka, Lagos State, ORCID: <https://orcid.org/0000-0003-2517-8545>

Disclosures: The authors declare no conflicts of interest.

Background

The inclusion of mental health in the Sustainable Development Goals, which were adopted at the United Nations General Assembly in September 2015, is adding more importance to the goal of improving mental health in the general population.¹ Stigma associated with mental health disorders is a major barrier to the effective treatment of mental disorders.^{2,3} Stigma directed toward individuals with mental health disorders is associated with lower satisfaction with life, fewer employment opportunities and limitations at work, lower educational status, and low self-esteem.⁴⁻⁶ Even as stigma against other discriminated populations has gradually decreased, individuals with mental health disorders have remained stigmatized.² People with mental health disorders, therefore, struggle not only with the symptoms of the mental disorders, but also with the effect of stigma on their quality of life.⁷ Stigma is a multifaceted concept comprising many dimensions, which include (but are not limited to) personal stigma, internalized self-stigma, perceiving mental disorders to be due to weakness, perceived dangerousness, desire for social control, and desire for social distance.⁸ Social distance in the context of mental health disorders refers to the desire to avoid contact with people with mental health disorders and is commonly used to measure stigma.⁸

Pharmacists are considered the most accessible health care providers.⁹ The pharmacists' unique placement, as well as regular contact with mental health consumers, could lead them to play a major role in the field of mental health in primary health care.¹⁰ According to a study done by Black and colleagues,¹¹ pharmacists are rated as one of the most common sources of information concerning psychotropic medications, second only to psychiatrists. In pharmaceutical care, one of the first roles of the pharmacist is to provide the patient with information concerning health conditions and medications. This role requires that the pharmacist resolves any misconceptions the patient may have about the medications and assess their level of understanding. Other roles include patient monitoring for medication adherence, effectiveness, and adverse effects. Properly fulfilling this role requires that the pharmacist communicates effectively and maintains a good rapport with the patient.¹² The previous Black et al¹¹ study in Canada shows that about 20% of mental health consumers expressed their dissatisfaction with the lack of medication education from pharmacists and reported a desire for more medication-related information.

Previous studies¹³⁻¹⁵ show that pharmacy students have negative attitudes toward people with mental health disorders. Assessing pharmacy students' attitudes toward people with mental health disorders is important as pharmacy students represent future pharmacists, and

improving their attitudes through interventions implemented at this stage to address the negative attitudes, if any, may translate to better service delivery when they, in turn, become practicing pharmacists.¹⁶ Intervention studies have been conducted among pharmacy students to improve their attitudes toward people with mental health disorders in countries including Australia,^{10,17} the United States,¹⁸ and Canada.¹⁹ Few studies among pharmacy students in Nigeria show negative attitudes and stigma.^{15,20} The module on mental health disorders is taught in the final year of the BPharm degree program. The pharmacotherapy of schizophrenia is a major focus of this module, and case studies of patients with schizophrenia are discussed at the end of lectures. Although studies from high-income countries show that conventional educational strategies may have little or no effect on misconceptions regarding mental health disorders,²¹ it is unclear what effect classroom lectures may have on final-year pharmacy students' attitudes and stigma in low-income countries such as Nigeria. Thus, the present study aimed to assess changes in attitudes and social distance toward persons with schizophrenia (PwS) among pharmacy students following classroom lectures and an optional movie about the experiences of PwS.

Methods

Study Design

The study comprised a presurvey and postsurvey carried out among final-year pharmacy students of the University of Nigeria Nsukka (UNN). Minimal sociodemographic data were collected from the study respondents to ensure anonymity.

Study Setting

The study was carried out in UNN. Apart from being the first indigenous university in the country, UNN is also the oldest and largest university in Eastern Nigeria.

Study Sample

Final-year students of the faculty of pharmaceutical sciences, UNN, were recruited for this study. A sample size of 179 was computed using G Power software (version 3.1.9) to perform a priori power analysis with the effect size ($f^2 = 0.15$), significance level ($\alpha = 0.05$), and desired statistical power ($1 - \beta = 0.99$).²² Recruited students were conveniently sampled in their classroom.

Study Instrument

The study utilized a self-administered, structured, paper-based questionnaire in English, comprising 3 sections.

English is the official language in Nigeria and the language of learning at all levels of education. The first section sought sociodemographic details; the second section was a 10-item attitude scale assessing the extent to which the students agreed with stereotypical statements about PwS on a 4-point Likert scale adapted from a previous study,^{23,24} the last section was a 7-item social distance scale developed by Link and colleagues.²⁵ The attitude scale contained 10 items that have a 4-level Likert scale of *never*, *rarely*, *sometimes*, and *always*. Increasing scores indicate more negative attitudes toward PwS. The scoring of the positively worded statements was reversed during analysis. Items in the social distance scale were rated on a 4-point Likert scale: *definitely no*, *probably no*, *probably yes*, *definitely yes*. Items were a combination of positively and negatively worded questions. Responses were scored from 1 = *definitely no* to 4 = *definitely yes*. Total possible scores range from 4 to 28 with increasing scores indicating increased stigma toward PwS.

The questionnaire was piloted among 20 conveniently sampled pharmacy students in their penultimate year of schooling to determine the reliability of the instrument among the study population. Internal consistency of the 2 sections of the questionnaire was calculated using Cronbach α technique (0.53 for the attitude domain, 0.76 for the social distance domain). The data obtained during the pilot test was not included in the study data. The lecture was a clinical lecture on schizophrenia delivered for 5 hours on 3 separate days within a week. Four hours were allocated to didactic lectures and 1 hour for discussion on a case of schizophrenia on the last day. The students were encouraged to watch the movie *A Beautiful Mind* after the first lecture on day 1. (*A Beautiful Mind* is a 2001 American biographical drama film based on the life of the American mathematician John Nash, a Nobel Laureate in economics and Abel Prize winner. The story revolves around Nash's diagnosis of paranoid schizophrenia, delusional episodes, and the burden of his condition on his wife and friends). Lectures were delivered by 2 pharmacists who had at least a master's degree in clinical pharmacy and pharmacy management. The pretest survey was administered before the start of the first lecture on schizophrenia. Four weeks after the last lecture on schizophrenia and affective disorders, students who participated in the presurvey were given the postsurvey. There was no incentive for participating in the study, and participation was entirely voluntary.

Ethical Considerations

The study protocol was approved by the Research Ethics Committee of the Faculty of Pharmaceutical Sciences (FPSRE/UNN/19/0006). Informed consent was obtained before the administration of the study instrument.

Data Analysis

The presurvey and postsurvey data were collected and entered into a Microsoft Excel spreadsheet and simple descriptive analyses (frequencies, means, and percentages) were conducted. The mean differences of survey item scores were computed using the paired sample *t* test with significance set at $P < .05$. All analyses were carried out using IBM SPSS version 21.0.

Results

One hundred seventy-nine students (of the 200 sampled, response rate 91.1%) agreed to participate and completed the survey instrument before the clinical lecture series. Nine questionnaires were not included in the analysis because they had >20% missing data. One hundred eight students who took part in the presurvey participated in the postsurvey (response rate 76.0%). Eighty-five students watched the movie before completing the postsurvey. No statistically significant differences ($P > .05$) were found between the gender and mean age (23.38 ± 2.122 and 23.61 ± 2.103 years) in presamples and postsamples of the students surveyed. There was a moderate significant association between the mean attitude score and the social distance score in the presurvey ($r = .512$, $P < .001$) and a weak significant association in the postsurvey ($r = .393$, $P < .001$).

Pharmacy Students' Negative Attitudes Toward PwS

The overall mean negative attitude score reduced from 2.79 ± 0.412 to 2.72 ± 0.357 ($t = 1.371$, $P = .173$). The most endorsed stereotypical comment, "PwS suffer from split or multiple personalities," had a higher mean value in the postsurvey (3.16 ± 0.738 vs 3.34 ± 0.699 , $t = -1.988$, $P = .049$). The belief that PwS are dangerous to the public increased in the postsurvey (2.60 ± 0.831 vs 2.79 ± 0.670 , $t = -1.862$, $P = .065$); see Table 1.

Pharmacy Students' Social Distance Toward PwS

The overall mean social distance score increased from 2.48 ± 0.415 to 2.49 ± 0.467 ($t = -0.241$, $P = .810$). In the presurvey, social distance was highest for "I would invite a PwS to my party," and it had a lower mean value in the postsurvey (2.83 ± 0.852 vs 2.75 ± 0.972 , $t = 0.721$, $P = .472$). In the postsurvey, social distance was highest for "I would fall in love with a PwS," and it increased after the lecture (2.44 ± 0.801 vs 3.31 ± 0.826 , $t = -8.090$, $P < .001$); see Table 2.

TABLE 1: Pharmacy students' negative attitudes toward persons with schizophrenia (PwS)^a

Question	Pretest, Mean ± SD	Posttest, Mean ± SD	Mean Difference (P Value)
i. PwS suffer from split or multiple personalities	3.16 ± 0.738	3.34 ± 0.699	-1.988 (.049) ^b
ii. PwS tend to be mentally retarded or of lower intelligence	2.87 ± 0.887	2.38 ± 0.883	3.858 (<.001) ^c
iii. PwS hear voices telling them what to do	3.05 ± 0.911	3.37 ± 0.620	-2.792 (.006) ^b
iv. PwS can be seen talking to themselves or shouting in city streets	3.13 ± 0.844	3.37 ± 0.590	-2.290 (.024) ^b
v. PwS are dangerous to the public	2.60 ± 0.831	2.79 ± 0.670	-1.862 (.065)
vi. PwS are a public nuisance due to manhandling, poor hygiene, or odd behavior	2.69 ± 0.942	2.82 ± 0.807	-1.088 (.279)
vii. PwS can be successfully treated outside of the hospital in the community ^d	2.64 ± 0.894	2.44 ± 0.803	1.072 (.092)
viii. PwS can be successfully treated without drugs using psychotherapy	2.63 ± 0.917	2.28 ± 0.844	2.928 (.004) ^c
ix. PwS can work at regular jobs ^d	2.81 ± 0.901	2.44 ± 0.899	2.935 (.004) ^c
x. PwS can be creative ^d	2.37 ± 0.838	1.972 ± 0.791	3.544 (.001) ^c
Overall mean attitude score	2.79 ± 0.412	2.72 ± 0.357	1.371 (.173)

^aMean differences of survey item scores were computed using paired-sample *t* test. Higher scores indicate more negative attitudes toward PwS.

^b*P* < .05.

^c*P* < .01 were considered statistically significant.

^dScores were reversed during analysis.

Sociodemographic Differences in Negative Attitudes Toward PwS Among Pharmacy Students

Females (*n* = 88) had a higher negative attitude toward PwS compared with males (*n* = 82) in the presurvey (2.92 ± 0.364 vs 2.85 ± 0.455, *P* = .255), whereas males (*n* = 41) had a higher negative attitude than females (*n* = 63) in the postsurvey (2.79 ± 0.378 vs 2.67 ± 0.338, *P* = .091). There is a statistically significant difference in negative attitudes based on students' mothers' education in the pretest (*P* = .040). In both presurveys and post-surveys, people who had a friend or relative with schizophrenia (*n* = 17) had a lower mean negative attitude score compared with those who did not (2.82 ± 0.371 vs

2.89 ± 0.419, 2.68 ± 0.269 vs 2.73 ± 0.370, respectively). People who watched the movie recommendation (*n* = 85) had a higher mean negative attitude score (2.74 ± 0.346 vs 2.67 ± 0.389, *P* = .433); see Table 3. People who watched the movie recommendation had a lower mean score compared to those who did not in the question "PwS tend to be mentally retarded or of lower intelligence" (2.65 ± 0.832 vs 2.30 ± 0.888, *t* = 1.683, *P* = .594). People who watched the movie recommendation had a slightly higher mean score than those who did not in the question "PwS are dangerous to the public" (2.78 ± 0.736 vs 2.79 ± 0.656, *t* = -0.036, *P* = .972). (These are not included in Table 3.)

TABLE 2: Pharmacy students' social distance toward persons with schizophrenia (PwS)^a

Question	Pretest, Mean ± SD	Posttest, Mean ± SD	Mean Difference (P value)
i. I would be afraid to talk to a PwS	2.11 ± 0.915	2.29 ± 0.952	-1.306 (.194)
ii. I would be upset or disturbed to be in the same class with a PwS	2.12 ± 0.918	2.09 ± 0.937	0.223 (.824)
iii. I would start a friendship with a PwS ^b	2.63 ± 0.885	2.66 ± 0.931	0.311 (.756)
iv. I would invite a PwS to my party ^b	2.83 ± 0.852	2.75 ± 0.972	0.721 (.472)
v. I would feel embarrassed or ashamed if my friends knew that someone in my family had schizophrenia	2.14 ± 0.926	2.38 ± 1.061	-1.723 (.088)
vii. I would share my room on a school excursion with a PwS ^b	2.16 ± 0.852	1.96 ± 0.868	1.644 (.103)
viii. I would fall in love with a PwS ^b	2.44 ± 0.801	3.31 ± 0.826	-8.090 (<.001) ^c
Overall mean social distance score	2.48 ± 0.415	2.49 ± 0.467	-0.241 (.810)

^aMean differences of survey item scores were computed using paired sample *t* test. Higher scores indicate increased stigma.

^bScores were reversed during analysis.

^c*P* < .01 were considered statistically significant.

TABLE 3: Sociodemographic differences in negative attitudes toward persons with schizophrenia (PwS) among pharmacy students^a

	Pretest			Posttest		
	n	Mean ± SD	P Value	n	Mean ± SD	P Value
Gender ^b			.255			.091
Male	82	2.85 ± 0.455		41	2.79 ± 0.378	
Female	88	2.92 ± 0.364		63	2.67 ± 0.338	
Mother's education			.040 ^c			.083
Nonformal	17	2.82 ± 0.375		10	2.90 ± 0.587	
Primary	10	2.72 ± 0.426		11	2.90 ± 0.409	
Secondary	26	3.08 ± 0.443		21	2.68 ± 0.296	
Tertiary	117	2.87 ± 0.398		66	2.68 ± 0.307	
Occupation of parents			.960			.819
Health related	41	2.88 ± 0.406		18	2.74 ± 0.259	
Non-health related	129	2.89 ± 0.414		90	2.72 ± 0.372	
Friend/relative with schizophrenia			.536			.571
No	154	2.89 ± 0.419		90	2.73 ± 0.370	
Yes	16	2.82 ± 0.371		18	2.68 ± 0.269	
Lectures attended						.171
0	...	...		2	2.25 ± 0.636	
1	...	...		9	2.82 ± 0.626	
2	...	...		21	2.66 ± 0.284	
3	...	...		76	2.74 ± 0.320	
Watched the movie						.433
No	...	...		23	2.67 ± 0.389	
Yes	...	...		85	2.74 ± 0.346	

^aHigher scores indicate more negative attitudes toward PwS.

^bFour respondents did not disclose their gender in the postsurvey.

^c $P < .05$ was considered statistically significant.

Sociodemographic Differences in the Social Distance Toward PwS Among Pharmacy Students

Students whose parents were in a health-related profession ($n=41$) had a lower social distance toward PwS in both presurveys (2.49 ± 0.425 vs 2.52 ± 0.491 , $P=.775$) and postsurveys (2.43 ± 0.492 vs 2.51 ± 0.461 , $P=.511$). There was a statistically significant difference in the students' social distance based on their mothers' education; respondents whose mothers had a primary school education had the least social distance toward PwS (2.21 ± 0.432 , $P=.010$). People who watched the movie recommendation had a lower social distance toward PwS (2.48 vs 2.57 , $P=.415$); see Table 4.

Discussion

The findings of this study reveal that classroom lectures on mental disorders and a movie recommendation on schizophrenia did not significantly improve final-year

pharmacy students' overall attitudes and stigma toward PwS. There were no significant differences in the age and gender of the study participants at both times. One important finding is that the recommended movie to aid students' understanding of the disease may promote negative attitudes and stigma despite providing life experiences of PwS.

Although there was a reduction in the overall negative attitude score of the students surveyed after the lectures, endorsement of some specific stereotypical statements increased in the postsurvey. For example, the belief that PwS are dangerous to the public and have split personalities increased in the poststudy. The misperception that PwS have split personality is a common stereotype as evidenced by numerous studies across the globe.²⁶⁻²⁸ The perception of the dangerousness of PwS is also strongly linked to their stigmatization.²⁹ These perceptions are believed to be promoted by negative media portrayals of people with mental health disorders.³⁰ Indeed, the movie recommendation may have had a role in increasing this perception as the protagonist (who had

TABLE 4: Sociodemographic differences in social distance toward persons with schizophrenia (PwS) among pharmacy students^a

	Pretest			Posttest		
	n	Mean ± SD	P Value	n	Mean ± SD	P Value
Gender ^b			.719			.821
Male	82	2.49 ± 0.513		41	2.51 ± 0.506	
Female	88	2.52 ± 0.439		63	2.49 ± 0.437	
Mother's education			.010 ^c			.196
Nonformal	17	2.58 ± 0.442		10	2.70 ± 0.557	
Primary	10	2.21 ± 0.432		11	2.68 ± 0.193	
Secondary	26	2.75 ± 0.515		21	2.49 ± 0.522	
Tertiary	117	2.48 ± 0.457		66	2.45 ± 0.456	
Occupation of parents			.775			.511
Health related	41	2.49 ± 0.425		18	2.43 ± 0.492	
Non-health related	129	2.52 ± 0.491		90	2.51 ± 0.461	
Friend/relative with schizophrenia			.515			.225
No	153	2.52 ± 0.481		90	2.52 ± 0.461	
Yes	17	2.44 ± 0.421		18	2.37 ± 0.478	
Lectures attended						.171
0	...	...		2	2.21 ± 0.101	
1	...	...		9	2.69 ± 0.719	
2	...	...		21	2.59 ± 0.382	
3	...	...		76	2.45 ± 0.449	
Watched the movie						.415
No	...	...		23	2.57 ± 0.541	
Yes	...	...		85	2.48 ± 0.444	

^aHigher scores indicate increased stigma.

^bFour respondents did not disclose their gender in the postsurvey.

^c*P* < .05 is statistically significant.

schizophrenia) was portrayed to have sudden personality changes, which may have nurtured the negative stereotypes of erratic behavior and violence associated with the disease.³¹ The media is the most common source of information about mental health disorders.³² Although the media produces some educational materials on mental health disorders, the vast archives of negative depictions of mental health disorders outweigh the positive and are much more memorable and far-reaching.³³ The media is not only a reflection of the public's beliefs and attitudes, but also a major influence on these attitudes.³⁴ In reviews of the media's depiction of mental health disorders, certain themes, such as dangerousness/unpredictability, simplicity, asociality, and unproductiveness, have emerged, the most common of which is dangerousness.³⁵⁻³⁷ Although people who watched the movie recommendation had reduced social distance, the mean negative attitude score increased in the postsurvey.

The belief that PwS tend to have a developmental disability or are of lower intelligence significantly reduced in the postsurvey. One factor that may have contributed

to this could be the protagonist from the movie, who was portrayed to be a genius. However, psychiatric disorders are known to be more common in people with learning disabilities than in the general population.³⁸ A dual diagnosis of schizophrenia and developmental disability is often overlooked and neglected because cognitive impairments may mask delusions and other symptoms.³⁸

There was a slight increase in the social distance toward PwS in the postsurvey. The level of desired social distance is used as an assessment of stigma and discriminatory behavior toward adults with mental health disorders, and higher scores indicate higher levels of stigma.^{39,40} Social distance scores increased for all items on the social distance scale except "I would be upset or disturbed to be in the same class with a PwS" and "I would share my room on a school excursion with a PwS" for which social distance decreased. Previous studies^{20,41} show that desired social distance increases with increasing intimacy of association. Perhaps this may explain why social distance increased in more intimate scenarios, such as falling in love with PwS. People with a friend or relative

with schizophrenia had a lower mean negative attitude score compared with those who did not. Having a friend or relative with mental health disorders is associated with more positive attitudes and less social distance toward people with mental health disorders in several studies even when different scales are used to assess social distance.^{42,43}

Students whose parents were in a health-related profession had lower social distance toward PwS in both presurveys and postsurveys. There were statistically significant differences in the students' negative attitudes and social distance based on their mothers' education in the presurvey but not in the postsurvey; respondents whose mothers had a primary school education had the least negative attitude and social distance toward PwS. Family background is shown to have several influences on children's beliefs, attitudes, and inevitably stigma toward mental health disorders.⁴⁴ Perhaps students whose parents were health care professionals had a better understanding of mental health disorders, and this translated to less desire for social distance compared with their counterparts whose parents were not health care professionals. Also, being health care professionals meant that these parents were more educated because tertiary education is required for most health care professions.

There was a moderately significant positive association between attitude and social distance that reduced in the postsurvey. This corroborates the findings of a previous study⁴⁵ in the United States that found having a more negative attitude toward mental health disorders is associated with a greater desire for social distance from people with mental health disorders. Strategies to combat the stigma associated with mental health disorders should be directed toward both attitudes and social distance because the two constructs are related.⁴⁵

The study findings highlight the importance of including modules targeted at reducing stigma about mental health disorders in pharmacy education. Having a general knowledge of mental health disorders and their pharmacotherapy does not translate into understanding, relating to, or empathizing with people living with mental health disorders.⁴⁶ A growing body of literature highlights the efficacy of the use of consumer educators (ie, patients with the disease state of interest) in pharmacy curricula and interventions. The addition of consumer educators to pharmacy training is shown to significantly improve pharmacy student attitudes toward mental health disorders above standardized pharmacy mental health training.⁴⁷⁻⁴⁹ Admittedly, access to consumer educators may not be feasible in resource-limited settings, such as Nigeria; however, a cost-effective intervention involving active-learning exercises, patient videos, and role-playing

is shown to be as effective as consumer education and may be adopted.⁴⁶ A study⁴⁶ conducted in the United States finds that a brief antistigma intervention, which included role-playing, active-learning exercises, and patient videos, conducted among pharmacy students significantly reduced safety-related concerns, which, in turn, led to significant reductions in overall stigma.

The results from this study should be viewed in light of several limitations. The posttest was administered 4 weeks after the lectures. Thus, the impact of the lecture and the movie cannot be extrapolated to a longer follow-up period. There may also be the risk of convenience bias as the study respondents were sampled conveniently. Additionally, there is the risk of social desirability bias because of the self-report and sensitive nature of the study. The impact of this bias was, however, limited by making the survey anonymous. Although the required sample size to find a significant difference was achieved, some questionnaires were not completed and had to be excluded from the analyses. The results from this study may have limited generalizability to other schools of pharmacy in the country and elsewhere.

Conclusion

This study indicates that more work needs to be done to enhance the delivery of teaching to improve pharmacy students' attitudes and stigma toward individuals with mental health disorders. Didactic classroom lectures on mental disorders among pharmacy students might not significantly improve the overall attitudes and stigma toward PwS. Additionally, watching a contemporary movie may not accurately portray mental health disorders and could worsen stigma and negative attitudes toward PwS. Curricula on mental health disorder education for pharmacy students should incorporate targeted antistigma modules to prepare them to take up roles in mental health care as future pharmacists. Schools of pharmacy should consider alternative formats of teaching mental health-related topics, such as contact with real patients, standardized patients, role play, simulation, use of social media, guest speakers and their personal experiences, short videos of people talking about their personal experiences, factual video clips taken from documentaries/training videos, and writing assignments designed to foster empathy.

References

1. Gigliotti M, Schmidt-Traub G, Bastianoni S. The sustainable development goals. In: Fath B, editor. *Encyclopedia of ecology*. 2nd ed. Oxford: Elsevier; 2019. p. 426-31.
2. Stier A, Hinshaw SP. Explicit and implicit stigma against individuals with mental illness. *Aust Psychol*. 2007;42(2):106-17.

3. Sartorius N. Stigma and mental health. *Lancet*. 2007;370(9590):810-1. DOI: [10.1016/S0140-6736\(07\)61245-8](https://doi.org/10.1016/S0140-6736(07)61245-8). PubMed PMID: [17804064](https://pubmed.ncbi.nlm.nih.gov/17804064/).
4. Alonso J, Buron A, Rojas-Farreras S, de Graaf R, Haro JM, de Girolamo G, et al. Perceived stigma among individuals with common mental disorders. *J Affect Disord*. 2009;118(1-3):180-6. DOI: [10.1016/j.jad.2009.02.006](https://doi.org/10.1016/j.jad.2009.02.006). PubMed PMID: [19285349](https://pubmed.ncbi.nlm.nih.gov/19285349/).
5. Hampson ME, Watt BD, Hicks RE. Impacts of stigma and discrimination in the workplace on people living with psychosis. *BMC Psychiatry*. 2020;20(1):288. DOI: [10.1186/s12888-020-02614-z](https://doi.org/10.1186/s12888-020-02614-z). PubMed PMID: [32513133](https://pubmed.ncbi.nlm.nih.gov/32513133/); PubMed Central PMCID: [PMC7278154](https://pubmed.ncbi.nlm.nih.gov/PMC7278154/).
6. Link BG, Struening EL, Neese-Todd S, Asmussen S, Phelan JC. Stigma as a barrier to recovery: the consequences of stigma for the self-esteem of people with mental illnesses. *Psychiatr Serv*. 2001;52(12):1621-6. DOI: [10.1176/appi.ps.52.12.1621](https://doi.org/10.1176/appi.ps.52.12.1621). PubMed PMID: [11726753](https://pubmed.ncbi.nlm.nih.gov/11726753/).
7. Rüsçh N, Angermeyer MC, Corrigan PW. Mental illness stigma: concepts, consequences, and initiatives to reduce stigma. *Eur Psychiatr*. 2005;20(8):529-39. DOI: [10.1016/j.eurpsy.2005.04.004](https://doi.org/10.1016/j.eurpsy.2005.04.004). PubMed PMID: [16171984](https://pubmed.ncbi.nlm.nih.gov/16171984/).
8. Jorm AF, Oh E. Desire for social distance from people with mental disorders. *Aust N Z J Psychiatry*. 2009;43(3):183-200. DOI: [10.1080/00048670802653349](https://doi.org/10.1080/00048670802653349). PubMed PMID: [19221907](https://pubmed.ncbi.nlm.nih.gov/19221907/).
9. Moore CH, Powell BD, Kyle JA. The role of the community pharmacist in mental health. *US Pharm*. 2018;43(11):13-20.
10. Nguyen E, Chen TF, O'Reilly CL. Evaluating the impact of direct and indirect contact on the mental health stigma of pharmacy students. *Soc Psychiatry Psychiatr Epidemiol*. 2012;47(7):1087-98. DOI: [10.1007/s00127-011-0413-5](https://doi.org/10.1007/s00127-011-0413-5). PubMed PMID: [21755345](https://pubmed.ncbi.nlm.nih.gov/21755345/).
11. Black E, Murphy AL, Gardner DM. Community pharmacist services for people with mental illnesses: preferences, satisfaction, and stigma. *Psychiatr Serv*. 2009;60(8):1123-7. DOI: [10.1176/ps.2009.60.8.1123](https://doi.org/10.1176/ps.2009.60.8.1123). PubMed PMID: [19648202](https://pubmed.ncbi.nlm.nih.gov/19648202/).
12. Scheerder G, De Coster I, Van Audenhove C. Pharmacists' role in depression care: a survey of attitudes, current practices, and barriers. *Psychiatr Serv*. 2008;59(10):1155-60. DOI: [10.1176/appi.ps.59.10.1155](https://doi.org/10.1176/appi.ps.59.10.1155). PubMed PMID: [18832501](https://pubmed.ncbi.nlm.nih.gov/18832501/).
13. Bell JS, Aaltonen SE, Bronstein E, Desplenter FA, Foulon V, Vitola A, et al. Attitudes of pharmacy students toward people with mental disorders, a six country study. *Pharm World Sci*. 2008;30(5):595-9. DOI: [10.1007/s11096-008-9211-x](https://doi.org/10.1007/s11096-008-9211-x). PubMed PMID: [18360783](https://pubmed.ncbi.nlm.nih.gov/18360783/).
14. Shakeel S, Naveed S. Pharmacy students' attitude and stigmatization of people with schizophrenia in Pakistan. *J Bioequiv Availab*. 2013;8(3):108-11. DOI: [10.4172/jbb.1000278](https://doi.org/10.4172/jbb.1000278).
15. Anosike C, Ukwe CV, Oparah AC. Attitudes of pharmacy and non-pharmacy students towards mental illness in Nigeria: a comparative survey. *Int J Pharm Pract*. 2020;28(4):346-54. DOI: [10.1111/ijpp.12601](https://doi.org/10.1111/ijpp.12601). PubMed PMID: [32017285](https://pubmed.ncbi.nlm.nih.gov/32017285/).
16. Sherwood DA. Healthcare curriculum influences on stigma towards mental illness: core psychiatry course impact on pharmacy, nursing and social work student attitudes. *Curr Pharm Teach Learn*. 2019;11(2):198-203. DOI: [10.1016/j.cptl.2018.11.001](https://doi.org/10.1016/j.cptl.2018.11.001). PubMed PMID: [30733018](https://pubmed.ncbi.nlm.nih.gov/30733018/).
17. O'Reilly CL, Bell JS, Chen TF. Consumer-led mental health education for pharmacy students. *Am J Pharm Educ*. 2010;74(9):167. DOI: [10.5688/aj7409167](https://doi.org/10.5688/aj7409167). PubMed PMID: [21301601](https://pubmed.ncbi.nlm.nih.gov/21301601/); PubMed Central PMCID: [PMC2996757](https://pubmed.ncbi.nlm.nih.gov/PMC2996757/).
18. Buhler AV, Karimi RM. Peer-level patient presenters decrease pharmacy students' social distance from patients with schizophrenia and clinical depression. *Am J Pharm Educ*. 2008;72(5):106. DOI: [10.5688/aj7205106](https://doi.org/10.5688/aj7205106). PubMed PMID: [19214260](https://pubmed.ncbi.nlm.nih.gov/19214260/).
19. Patten SB, Remillard A, Phillips L, Modgill G, Szeto AC, Kassam A, et al. Effectiveness of contact-based education for reducing mental illness-related stigma in pharmacy students. *BMC Med Educ*. 2012;12:120. DOI: [10.1186/1472-6920-12-120](https://doi.org/10.1186/1472-6920-12-120). PubMed PMID: [23216787](https://pubmed.ncbi.nlm.nih.gov/23216787/); PubMed Central PMCID: [PMC3533989](https://pubmed.ncbi.nlm.nih.gov/PMC3533989/).
20. Ehijie EOE, Okpalla CM. Attitudes of pharmacy students toward patients with mental illness in Benin City, Nigeria. *African J Pharm Res Dev*. 2012;4(2):44-8.
21. Bell JS, Whitehead P, Aslani P, Sacker S, Chen TF. Design and implementation of an educational partnership between community pharmacists and consumer educators in mental health care. *Am J Pharm Educ*. 2006;70(2):28. DOI: [10.5688/aj700228](https://doi.org/10.5688/aj700228). PubMed PMID: [17149408](https://pubmed.ncbi.nlm.nih.gov/17149408/); PubMed Central PMCID: [PMC1636921](https://pubmed.ncbi.nlm.nih.gov/PMC1636921/).
22. Faul F, Erdfelder E, Lang A-G, Buchner A. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behav Res Methods*. 2007;39(2):175-91. DOI: [10.3758/BF03193146](https://doi.org/10.3758/BF03193146). PubMed PMID: [17695343](https://pubmed.ncbi.nlm.nih.gov/17695343/).
23. Economou M, Peppou LE, Louki E, Stefanis CN. Medical students' beliefs and attitudes towards schizophrenia before and after undergraduate psychiatric training in Greece. *Psychiatry Clin Neurosci*. 2012;66(1):17-25. DOI: [10.1111/J.1440-1819.2011.02282.X](https://doi.org/10.1111/J.1440-1819.2011.02282.X). PubMed PMID: [22250606](https://pubmed.ncbi.nlm.nih.gov/22250606/).
24. Thompson AH, Stuart H, Bland RC, Arboleda-Florez J, Warner R, Dickson RA. Attitudes about schizophrenia from the pilot site of the WPA worldwide campaign against the stigma of schizophrenia. *Soc Psychiatry Psychiatr Epidemiol*. 2002;37(10):475-82. DOI: [10.1007/S00127-002-0583-2](https://doi.org/10.1007/S00127-002-0583-2). PubMed PMID: [12242626](https://pubmed.ncbi.nlm.nih.gov/12242626/).
25. Link BG, Phelan JC, Bresnahan M, Stueve A, Pescosolido BA. Public conceptions of mental illness: labels, causes, dangerousness, and social distance. *Am J Public Health*. 1999;89(9):1328-33. DOI: [10.2105/AJPH.89.9.1328](https://doi.org/10.2105/AJPH.89.9.1328). PubMed PMID: [10474548](https://pubmed.ncbi.nlm.nih.gov/10474548/); PubMed Central PMCID: [PMC1508784](https://pubmed.ncbi.nlm.nih.gov/PMC1508784/).
26. Stuart H, Arboleda-Florez J. Community attitudes toward people with schizophrenia. *Can J Psychiatry*. 2001;46(3):245-52. DOI: [10.1177/070674370104600304](https://doi.org/10.1177/070674370104600304). PubMed PMID: [11320678](https://pubmed.ncbi.nlm.nih.gov/11320678/).
27. Grausgruber A, Katschnig H, Meise U, Schöny W. Einstellungen der österreichischen Bevölkerung zu Schizophrenie [Attitudes of the Austrian public towards schizophrenia]. *Neuropsychiatrie*. 2002;16:54-67.
28. Luty J, Fekadu D, Dhandayudham A. Understanding of the term "schizophrenia" by the British public. *World Psychiatry*. 2006;5(3):177-8. PubMed PMID: [17139354](https://pubmed.ncbi.nlm.nih.gov/17139354/).
29. Corrigan PW, Bink AB. The stigma of mental illness. In: Friedman H, editor. *Encyclopedia of mental health*. Oxford: Academic Press; 2016. p. 230-4.
30. Philo G, Secker J, Platt S, Henderson L, McLaughlin G, Burnside J. The impact of the mass media on public images of mental illness: media content and audience belief. *Health Educ J*. 1994;53(3):271-81. DOI: [10.1177/001789699405300305](https://doi.org/10.1177/001789699405300305).
31. Schomerus G, Kenzin D, Borsche J, Matschinger H, Angermeyer MC. The association of schizophrenia with split personality is not an ubiquitous phenomenon. *Soc Psychiatr Epidemiol*. 2007;42(10):780-6. DOI: [10.1007/s00127-007-0235-7](https://doi.org/10.1007/s00127-007-0235-7). PubMed PMID: [17660932](https://pubmed.ncbi.nlm.nih.gov/17660932/).
32. Reavley NJ, Cvetkovski S, Jorm AF. Sources of information about mental health and links to help seeking: findings from the 2007 Australian National Survey of Mental Health and Wellbeing. *Soc Psychiatry Psychiatr Epidemiol*. 2011;46(12):1267-74. DOI: [10.1007/s00127-010-0301-4](https://doi.org/10.1007/s00127-010-0301-4). PubMed PMID: [20978883](https://pubmed.ncbi.nlm.nih.gov/20978883/).
33. Stuart H. Media portrayal of mental illness and its treatments: what effect does it have on people with mental illness? *CNS Drugs*. 2006;20(2):99-106. DOI: [10.2165/00023210-200620020-00002](https://doi.org/10.2165/00023210-200620020-00002). PubMed PMID: [16478286](https://pubmed.ncbi.nlm.nih.gov/16478286/).
34. Srivastava K, Chaudhury S, Bhat PS, Mujawar S. Media and mental health. *Ind Psychiatry J*. 2018;27(1):1-5. DOI: [10.4103/ijp.ipj_73_18](https://doi.org/10.4103/ijp.ipj_73_18). PubMed PMID: [30416284](https://pubmed.ncbi.nlm.nih.gov/30416284/).
35. Coverdale J, Nairn R, Claasen D. Depictions of mental illness in print media: a prospective national sample. *Aust N Z J*

- Psychiatry. 2002;36(5):697-700. DOI: [10.1046/j.1440-1614.2002.00998.x](https://doi.org/10.1046/j.1440-1614.2002.00998.x). PubMed PMID: [12225457](https://pubmed.ncbi.nlm.nih.gov/12225457/).
36. Wilson C, Nairn R, Coverdale J, Panapa A. Mental illness depictions in prime-time drama: identifying the discursive resources. *Aust N Z J Psychiatry*. 1999;33(2):232-9. DOI: [10.1046/j.1440-1614.1999.00543.x](https://doi.org/10.1046/j.1440-1614.1999.00543.x). PubMed PMID: [10336221](https://pubmed.ncbi.nlm.nih.gov/10336221/).
 37. Stout PA, Villegas J, Jennings NA. Images of mental illness in the media: identifying gaps in the research. *Schizophr Bull*. 2004;30(3):543-61. DOI: [10.1093/oxfordjournals.schbul.a007099](https://doi.org/10.1093/oxfordjournals.schbul.a007099). PubMed PMID: [15631244](https://pubmed.ncbi.nlm.nih.gov/15631244/).
 38. Rabia K, Khoo EM. A mentally retarded patient with schizophrenia. *Malays Fam Physician*. 2008;3(3):146-50. PubMed PMID: [25606140](https://pubmed.ncbi.nlm.nih.gov/25606140/).
 39. Link BG, Phelan JC. Conceptualizing stigma. *Annu Rev Sociol*. 2001;27(1):363-85. DOI: [10.1146/annurev.soc.27.1.363](https://doi.org/10.1146/annurev.soc.27.1.363).
 40. Baumann AE. Stigmatization, social distance and exclusion because of mental illness: the individual with mental illness as a "stranger." *Int Rev Psychiatry*. 2007;19(2):131-5. DOI: [10.1080/09540260701278739](https://doi.org/10.1080/09540260701278739). PubMed PMID: [17464791](https://pubmed.ncbi.nlm.nih.gov/17464791/).
 41. Oluwole LO, Obadeji A, Dada UM. Perceptions and attitudes of students of mass communication toward mental illness in Nigerian tertiary institution. *Indian J Soc Psychiatry*. 2016;32(4):315. DOI: [10.4103/0971-9962.193650](https://doi.org/10.4103/0971-9962.193650).
 42. Cates ME, Neace AL, Woolley TW. Pharmacy students' attitudes toward mental illness at the beginning and end of the professional curriculum. *Curr Pharm Teach Learn*. 2012;4(2):132-6. DOI: [10.1016/j.cptl.2012.01.005](https://doi.org/10.1016/j.cptl.2012.01.005).
 43. Seaton V, Piel M. Student pharmacists' social distancing toward people with mental illness. *Ment Health Clin [Internet]*. 2017;7(5):181-6. DOI: [10.9740/mhc.2017.09.181](https://doi.org/10.9740/mhc.2017.09.181). PubMed PMID: [29955521](https://pubmed.ncbi.nlm.nih.gov/29955521/); PubMed Central PMCID: [PMC6007717](https://pubmed.ncbi.nlm.nih.gov/PMC6007717/).
 44. Parsons JE, Adler TF, Kaczala CM. Socialization of achievement attitudes and beliefs: parental influences. *Child Dev*. 1982;53(2):310. DOI: [10.2307/1128973](https://doi.org/10.2307/1128973).
 45. Smith AL, Cashwell CS. Social distance and mental illness: attitudes among mental health and non-mental health professionals and trainees. *The Professional Counselor: Research and Practice*. 2011;1(1):13-20. DOI: [10.15241/als.1.1.13](https://doi.org/10.15241/als.1.1.13).
 46. Bamgbade BA, Ford KH, Barner JC. Impact of a mental illness stigma awareness intervention on pharmacy student attitudes and knowledge. *Am J Pharm Educ*. 2016;80(5):80. DOI: [10.5688/ajpe80580](https://doi.org/10.5688/ajpe80580). PubMed PMID: [27402983](https://pubmed.ncbi.nlm.nih.gov/27402983/); PubMed Central PMCID: [PMC4937975](https://pubmed.ncbi.nlm.nih.gov/PMC4937975/).
 47. Bell JS, Johns R, Rose G, Chen TF. A comparative study of consumer participation in mental health pharmacy education. *Ann Pharmacother*. 2006;40(10):1759-65. DOI: [10.1345/aph.1H163](https://doi.org/10.1345/aph.1H163). PubMed PMID: [16968823](https://pubmed.ncbi.nlm.nih.gov/16968823/).
 48. Gable KN, Muhlstadt KL, Celio MA. A mental health elective to improve pharmacy students' perspectives on mental illness. *Am J Pharm Educ*. 2011;75(2):34. DOI: [10.5688/ajpe75234](https://doi.org/10.5688/ajpe75234). PubMed PMID: [21519423](https://pubmed.ncbi.nlm.nih.gov/21519423/); PubMed Central PMCID: [PMC3073109](https://pubmed.ncbi.nlm.nih.gov/PMC3073109/).
 49. Bell JS, Johns R, Chen TF. Pharmacy students' and graduates' attitudes towards people with schizophrenia and severe depression. *Am J Pharm Educ*. 2006;70(4):77. DOI: [10.5688/aj700477](https://doi.org/10.5688/aj700477). PubMed PMID: [17136196](https://pubmed.ncbi.nlm.nih.gov/17136196/).