Reviewer's report

Title: Effectiveness of contact-based strategies for reducing mental illness-related stigma in pharmacy students

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Reviewer: Nathaniel Rickles

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Effectiveness of contact-based strategies for reducing mental illness-related stigma in pharmacy students

The present manuscript reports on a multi-center randomized, controlled trial exploring the impact of patient interaction with pharmacy students on their stigma toward those with mental illness. The authors compared stigma levels between those who were initially exposed to the patient interactive session to those who did not receive the session initially but later on. They collected stigma levels at three time points: baseline, after early exposure, and after the later exposure. While both groups declined in level of stigma, the group receiving early exposure had greater decline than the group exposed later on. Effect sizes were calculated. The authors concluded the contact-based strategies were feasible and effective methods in reducing stigma among pharmacy students.

The manuscript presents an important issue/concern in pharmacy education and uses a methodological approach not yet presented in the literature on stigma among pharmacy students. There are a few concerns with the manuscript that should be addressed before this work receives approval for publication. The writing, at times, needs to be tightened and there are a few typos.

Compulsory Revisions:

1. Abstract: Methods section. It is confusing when the authors write that randomization allowed comparison between the early and later intervention group. Such suggests to the reader without going further to read the manuscript that the intent of the study was to compare early vs. later interaction with a patient. Yet, this doesn’t seem the primary interest of the manuscript; rather, to compare those who were exposed to the intervention vs. those who were not. Clearly, we understand that all eventually receive the intervention but the primary analysis is not about timing of the exposure but rather among those who receive it or not. If my sense of this is not correct, all the more reason that the authors need to sharpen their presentation of the design so it is clear and explicit the comparison groups and aims of the analysis.

2. Abstract: Methods section: It is also confusing when the authors write that “the primary endpoint is to compare change in stigma levels among those randomized to contact-based components of the curriculum.” As noted in #3 above, the authors need to be clearer about their language- primary endpoint is to compare
stigma levels between those initially exposed to contact-based strategy vs. those who are not? To compare degree of change from baseline across those initially exposed vs. those exposed later? Again, readers will be confused if the authors are mainly interested in early vs later exposure (timing question) vs. exposure vs. no exposure. Please clarify and tighten language so reader is clear from the abstract going forward to specifically what is being examined.

3. Abstract: Results section: The authors write that there was a more rapid decline in stigma for the early intervention group. It is not clear that the authors measure the rate of the decline in their study to be able to use the language “more rapid”. Did the authors mean “greater” decline? Also, they should state more clearly who the comparison group is in that sentence—greater decline than those in the later intervention group? Please clarify.

4. Abstract: Conclusion: What did the authors do in their study to assess feasibility? If this is kept in the conclusion, the authors should add in the methods of the abstract what they have done to assess feasibility.

5. Background: Given the relatively small body of literature on mental illness, stigma, and pharmacy, I was surprised that the authors’ review of the literature missed several studies on the topic including prior interventions to reduce stigma among pharmacy students and a relatively recent study in JAPhA on pharmacist stigma of mental illness and its association with provision of services. An older study by Crismon and colleagues looked at the role of a psychiatry rotation on student attitudes. Please consider revisiting the literature and identifying other manuscripts.

6. Background: Please clarify more clearly why the authors think contact with individuals with mental illness would be beneficial. What is it about contact that might help reduce stigma? Please state clearly so readers understand the rationale of the intervention to improve attitudes toward those with mental illnesses.

7. Methods: When did the late group receive the contact-based education in relationship to the early group? Months later? Please clarify time period between both exposures. Please also clarify how the authors kept the late group from knowing the exposure to the early group. Please better clarify how the exposures were separated as these details are unclear. For example, for those in the later group, what were they doing at the time the early group received the exposure? Are there multiple sections of the course or taught over different semesters and thus enabled the differential exposure? It is not clear how the authors employed the two groups.

8. Methods: Survey Instrument: Please provide psychometric properties of OMS-HC. Since the authors do not have published validation findings, I think reliability, validity, factor analysis, and other assessments of tool needs to be provided so readers can better appreciate the quality of the instrument used. This need not be extensive but some commentary on these aspects is needed.
9. Methods: Survey Instrument: Please clarify for readers why ad-hoc items were collected.

10. Results: Were there any differences between those who participated and those who did not? This is a critical point to clarify since the very students requiring an intervention to reduce stigma may not have received it. This might suggest a selection bias with the sample (those favorably oriented towards individuals with mental illness were the participants in the study) and might affect the generalizability of the findings. Please clarify.

11. Discussion: The authors note a shallow decline in OMS-HC scores when individuals exposed to the formal mental health curriculum vs. a steeper decline found with the contact-based group. Although I may still be unclear and mistaken, it seems the contact-based group was also exposed to the formal mental health curriculum. Can it be clearly delineated that the intervention effects on stigma are truly due to the contact only or a product of both contact and formal instruction. Please clarify and make clearer to the reader so results can be optimally interpreted.

12. Discussion: Another important limitation is that there may have been significant social desirability bias associated with evaluation of contact-based strategy. Students may have wanted to report more favorable attitudes to faculty post the involvement with patients because they may have thought the faculty was expecting such involvement to have a positive influence on their attitudes. The Rickles et al. (2010) paper suggests a method to help reduce the influence of social desirability on attitudes.

13. Table 4: It is not clear how the OM Survey totals presented in Table 3 are different than the OMS-HC score presented in Table 4. This is not clearly distinguished in the methods section of the manuscript. Please state clearly difference between OM Survey total and OMS-HC score. . . if no difference, please keep to only one name of the tool.

Minor Essential Revisions:

1. Tables 1 & 2: Authors should indicate at the bottom of the table if there were or were not any significant differences (and how this was tested) between T1, T1 to T2, and T1 to T3 across demographic factors listed in table.

2. Table 3: Please note any significant differences between groups in the OM Survey total Score results.

Discretionary Revisions:

1. Title: The authors use the phrasing “contact-based strategies” in the title. Are there more than one strategy presented? Seems to be primarily one approach of interactive lecture? Please clarify and adjust title accordingly.

2. Abstract: Methods section. It is confusing how the authors wrote about randomization process. The authors write that the “ timing of their administration
was randomized.” I assume it was the students that were randomized to receive the intervention to one of two different times vs. the timing of the intervention being randomized. Please clarify.

3. Background: Typically when studies are included in reviews/background sections they do not cite specific of population and response rates. It is not clear why the authors provided such specifics regarding the Phokeo study. It appears awkward and unclear.

4. Methods: Please clarify when the early group received their post exposure questionnaire.

5. Methods: Intervention. The authors indicate that the sessions were interactive. Since interactive piece is central to the contact-based strategy, please describe more fully how the intervention was interactive. Students asked many questions? Students had 1-to-1 discussions with speakers? Lectures are not necessarily interactive. Did faculty or speakers facilitate by prompting questions to students? More details needed to better understand how truly interactive the intervention was.

6. Methods: How stable were the consumers involved? Any additional information about the age, gender, ethnicity, education etc. of speakers/mental health consumers would help the reader have a better sense of how such factors might impact student thinking (how students may have perceived these characteristics- making some speakers more effective than others?).

7. Methods: How were students incentivized to complete surveys? Did they receive course credit or some other compensation? Please clarify.

8. Analysis: Did the authors need to perform a Bonferroni adjustment of the repeated stigma measures to ensure effect-size error rates do not exceed a certain threshold? Were tests needed to test sphericity assumptions? I am not a statistician so I encourage the authors/editors to confirm appropriateness of method.

9. Major Outcomes: The authors write at the bottom of pg. 10 that “by the final assessment (T3), scores were lower than baseline and again comparable between groups.” Was the change from baseline significant? Please note.

10. Discussion: The authors introduce traditional methods of teaching stigma and mental illness in the discussion. The authors might consider moving this material into their background to give readers a better sense of what has been in the past and, therefore, context for the study’s exploration into a context-based strategy. It seems a little odd that we are learning about these traditional methods in the discussion and not earlier.

11. Discussion: The authors should consider adding some reflections on whether the portrayal of a stabilized patient made more the difference in the impact on attitudes vs. actual reduced stigma towards the condition. That is, the impact on stigma may have been lessened if the contact-based strategy utilized individuals
that are still not well. It may not have been the actual contact that altered perceptions but rather the exposure to the concept that mentally ill individuals can recover and be functional. I suspect a video highlighting this latter concept might yield the similar improvements in stigma as the contact-based approach. This should be explored in future research.

Thank you for the opportunity to review this manuscript and I wish the authors my very best as they pursue publication of this work.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests.