PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Mediating effects of self-stigma on the relationship between perceived stigma and psychosocial outcomes among psychiatric outpatients
AUTHORS	Picco, Louisa; Lau, Ying Wen; Pang, Shirlene; Abdin, Edimansyah; Vaingankar, Janhavi; Chong, Siow Ann; Subramaniam, M

VERSION 1 - REVIEW

REVIEWER	Heather Stuart Queen's University, Kingston, Ontario, Canada
REVIEW RETURNED	16-Feb-2017

GENERAL COMMENTS	This is a well-written and interesting paper. It is nice to see a paper from Singapore as we don't know much about stigma outside of traditional western settings. This topic should be of considerable interest to the journal's readership. I have the following comments and suggestions for the authors: 1. This is a cross sectional study design with, it appears, a convenience sample. The nature of the sampling design should be more clearly specified and then discussed as a potential limitation to the study results. 2. Results are compared across diagnostic groups, which I think were clinically defined and abstracted from the charts. Was this the primary diagnosis? How were comorbidities (e.g. anxiety and depression) addressed in the analysis? 3. Mediation models assume a temporal ordering of factors which cannot be directly tested using a cross-sectional design. Some would argue that mediation analysis is not possible to do using cross sectional data; however, if a case can be made for the temporal ordering of variables I think this can be done. Therefore, I would suggest that the authors give some thought to the temporal ordering of public stigma as predating self-stigma. Reference to Link and Phelan's Conceptualizing Stigma may be helpful here. In fact, I see that some of this argument is contained in the discussion so it should be moved up in the manuscript. 4. The measures are strong. It is clear that the ISMI, DDS, WHOQOL-BREF, and RSES are self-report (though this isn't explicitly stated). It is not clear how the GAF was scored as this is usually done by a mental health professional as part of a diagnostic work-up. Could the authors provide more information on how data

	were collected using this (and the other) scales. Was it taken from the charts? How were missing items handled when constructing scale scores?

REVIEWER	Susanne Stolzenburg Department of Psychiatry, Medical University of Greifswald, Germany
REVIEW RETURNED	29-Mar-2017

GENERAL COMMENTS	This study uses a cross-sectional design to examine whether self-stigma mediates the relationship between perceived stigma and quality of life, self-esteem and general functioning, among outpatients with different mental disorders in Singapore. The topic of the study is interesting; however, the manuscript has some significant limitations. There are several minor comments, major points are #4 and #5. 1. There is no information about the total sample size in the text (only abstract). 2. It is unclear why authors used ICD-9 to categorize or diagnose participants. ICD-10 is widely used since the nineties. 3. There is no information whether there were patients having more than one diagnosis. For example rates of comorbidity for depression and anxiety disorders are usually very high. It is difficult to imagine that in the present study all participants only had one diagnosis. 4. As seen in previous studies, current depressive symptoms can influence perceptions of public stigma and cognitions on self-stigma. Statistical analyses were not controlled for current depressive symptoms or other measures which reflect present symptom severity. 5. There are some inaccuracies in interpreting the results. According to Baron and Kenny (1986), four criteria need to be met to establish mediation: perceived stigma has significant influence on psychosocial outcomes (z according to Figure 1); self-stigma has significant influence on psychosocial outcomes (y); perceived stigma has significant influence on self-stigma (x) and the influence of perceived stigma on psychosocial outcomes is reduced when self-stigma is entered simultaneously into the model (z*). If only xy is significant, there is no mediation effect but rather an indirect effect. In this study mediation effects and indirect effects are described as being the same, which they are not. If z* is still significant in the final model, the model is not fully mediated, but rather partially mediated. In this study fully mediated models and partially mediated models were described as being the same, too. These inaccuracies lead to a wrong understanding of the results. 6. The description of results from page 8 line 54 to page 9 line 15 is confusing. 7. Social desirability is mentioned as a limitation in the abstract, but not in in the discussion.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Reviewer Name: Heather Stuart
Institution and Country: Queen's University, Kingston, Ontario, Canada Competing Interests: None declared

This is a well-written and interesting paper. It is nice to see a paper from Singapore as we don't know much about stigma outside of traditional western settings. This topic should be of considerable interest to the journal's readership.

I have the following comments and suggestions for the authors:

1. This is a cross sectional study design with, it appears, a convenience sample. The nature of the sampling design should be more clearly specified and then discussed as a potential limitation to the study results.
We thank the Reviewer for this suggestion and have elaborated on the sampling in the methods and listed this as a limitation in the revised manuscript

2. Results are compared across diagnostic groups, which I think were clinically defined and abstracted from the charts. Was this the primary diagnosis? How were comorbidities (e.g. anxiety and depression) addressed in the analysis?
All respondents were classified based on their primary diagnosis which was determined by a medical record review. As part of the revised analysis, we have now controlled for comorbid psychiatric illnesses and as a result self-stigma now has a mediating effect on functioning amongst those with schizophrenia.

3. Mediation models assume a temporal ordering of factors which cannot be directly tested using a cross-sectional design. Some would argue that mediation analysis is not possible to do using cross sectional data; however, if a case can be made for the temporal ordering of variables I think this can be done. Therefore, I would suggest that the authors give some thought to the temporal ordering of public stigma as predating self-stigma. Reference to Link and Phelan's Conceptualizing Stigma may be helpful here. In fact, I see that some of this argument is contained in the discussion so it should be moved up in the manuscript.
We thank the Reviewer for highlighting this and have now expanded the introduction section to highlight how different types of stigma are theorized to present prior to others (e.g. public stigma will occur prior to self-stigma). Whilst mediation models assume a temporal ordering of factors, multiple cross-sectional studies have undertaken mediation analysis and are commonly used (see examples below). We have however listed this as an additional limitation in the revised manuscript.

- **Kao YC, Lien YJ, Chang HA, Wang SC, Tzeng NS, Loh CH. Evidence for the indirect effects of perceived public stigma on psychosocial outcomes: the mediating role of self-stigma. Psychiatry Research, 2016; 240:187-195**
- **Manos RC, Rusch LC, Kanter JW, Clifford LM. Depression self-stigma as a mediator of the relationship between depression severity and avoidance. Journal of Social and Clinical Psychology, 2009;28, 1128 –1143.**
- **Nielsen K, Yarker J, Randall R, Munir F. The mediating effects of team and self-efficacy on the relationship between transformational leadership, and job satisfaction and psychological well-being in healthcare professionals: A cross-sectional questionnaire survey. International Journal of Nursing Studies 2009; 46: 1236–1244**

4. The measures are strong. It is clear that the ISMI, DDS, WHOQOL-BREF, and RSES are self-report (though this isn't explicitly stated). It is not clear how the GAF was scored as this is usually done by a mental health professional as part of a diagnostic work-up. Could the authors provide more information on how data were collected using this (and the other) scales. Was it taken from the charts? How were missing items handled when constructing scale scores?
We had actually highlighted that all measures (with the exception of the GAF) were self-reported and listed this as a limitation in the manuscript. We have further emphasized this within the methods section of the revised manuscript. We have also elaborated on the scoring of the GAF. Finally, we included additional information on how missing items were handled when calculating scale scores.

Reviewer: 2
Reviewer Name: Susanne Stolzenburg

Institution and Country: Department of Psychiatry, Medical University of Greifswald, Germany
Competing Interests: None

This study uses a cross-sectional design to examine whether self-stigma mediates the relationship between perceived stigma and quality of life, self-esteem and general functioning, among outpatients with different mental disorders in Singapore. The topic of the study is interesting; however, the manuscript has some significant limitations. There are several minor comments, major points are #4 and #5.

1. There is no information about the total sample size in the text (only abstract).
We apologise for the oversight and have included this in the revised manuscript.

2. It is unclear why authors used ICD-9 to categorize or diagnose participants. ICD-10 is widely used since the nineties.
We acknowledge the issue raised by the Reviewer. As the Institute of Mental Health is a public hospital, it along with all other public hospitals in Singapore are still adopting the ICD-9, despite this being superseded by ICD-10 and unfortunately this is something beyond the control of the researchers.

3. There is no information whether there were patients having more than one diagnosis. For example rates of comorbidity for depression and anxiety disorders are usually very high. It is difficult to imagine that in the present study all participants only had one diagnosis.
Whilst we did not collect information on comorbid physical conditions (which we have listed as a limitation) we did capture data relating to comorbid psychiatric conditions and have now controlled for these comorbidities in the revised manuscript. As a result, self-stigma now has a mediating effect on functioning amongst those with schizophrenia.

4. As seen in previous studies, current depressive symptoms can influence perceptions of public stigma and cognitions on self-stigma. Statistical analyses were not controlled for current depressive symptoms or other measures which reflect present symptom severity.
We have now controlled for comorbid psychiatric conditions, such as depression, in the revised analysis. We also asked about symptom severity as part of the GAF, however unfortunately, as stated, we did not include a measure such as the Beck Depression Inventory, to specifically measure symptom severity and accordingly, listed this as a limitation. Patients were asked questions relating to different types of stigma and various psychosocial variables, with the interview taking 1 hour on average and whilst several other measures would have been valuable, the burden on participants would have been too high. We have also suggested that further studies explore the effects of symptom severity on stigma and psychosocial outcomes in the future.

5. There are some inaccuracies in interpreting the results. According to Baron and Kenny (1986), four criteria need to be met to establish mediation: perceived stigma has significant influence on psychosocial outcomes (z according to Figure 1); self-stigma has significant influence on psychosocial outcomes (y); perceived stigma has significant influence on self-stigma (x) and the influence of perceived stigma on psychosocial outcomes is reduced when self-stigma is entered simultaneously into the model (z*). If only xy is significant, there is no mediation effect but rather an indirect effect. In this study mediation effects and indirect effects are described as being the same, which they are not. If z* is still significant in the final model, the model is not fully mediated, but rather partially mediated. In this study fully mediated models and partially mediated models were described as being the same, too. These inaccuracies lead to a wrong understanding of the results.

We thank the Reviewer for highlighting this and we are aware of the Baron and Kenny method, however this is considered somewhat outdated now. In the current paper, we applied the Hayes method (2013), which uses bootstrapping to produce point estimates for the mediation effects as well as their bias-corrected and accelerated 95% confidence intervals (BCa CI). Using this current form of analysis, there is no longer 'partial' or 'full' mediation because the Hayes method focuses on the magnitude of the indirect effects to examine the presence of mediation. Several recent mediation papers relating to stigma have also applied the Hayes method of analysis whilst other papers have called for the need to apply newer mediation methods:

- **Cantwell J, Muldoon O and Gallagher S. The influence of self-esteem and social support on the relationship between stigma and depressive symptomology in parents caring for children with intellectual disabilities. Journal of Intellectual Disability Research 2015; 59: 948–957**
- **Quinn DM, Williams MK, and Weisz BW. From Discrimination to Internalized Mental Illness Stigma: The Mediating Roles of Anticipated Discrimination and Anticipated Stigma. Psychiatr Rehabil J. 2015 Jun; 38(2): 103–108.**
- **Rucker DD, Preacher KJ, Tormala ZL, Petty RE. Mediation Analysis in Social Psychology: Current Practices and New Recommendations. Social and Personality Psychology Compass 2011: 359–371**
- **Świtaj, P., Grygiel, P., Chrostek, A. et al. The relationship between internalized stigma and quality of life among people with mental illness: are self-esteem and sense of coherence sequential mediators? Qual Life Res 2017 doi:10.1007/s11136-017-1596-3**

6. The description of results from page 8 line 54 to page 9 line 15 is confusing.
We apologise for the confusion and have re-worded this section and hope it is now clearer.

7. Social desirability is mentioned as a limitation in the abstract, but not in in the discussion.
We had actually highlighted social desirability as a limitation in the first line of the limitation paragraph (see page 12).

VERSION 2 - REVIEW

REVIEWER	Susanne Stolzenburg research assistant; University Medicine Greifswald, Germany
REVIEW RETURNED	27-Jun-2017

GENERAL COMMENTS	All critical items of the review were answered and satisfactory changed in the manuscript. Thanks for cooperation. There are still two minor comments: 1. Please discuss potentially problems in using ICD-9 instead of ICD-10. 2. Please add information's about variables which were controlled (age, age of onset, gender, ethnicity, marital status, education, employment, co-morbid psychiatric disorders and hospitalization history) in mediation analyses. Are these variables significant in mediation analyses?

VERSION 2 – AUTHOR RESPONSE

Reviewer: 1
Reviewer Name: Susanne Stolzenburg
Institution and Country: University Medicine Greifswald, Germany Competing Interests: None declared

All critical items of the review were answered and satisfactory changed in the manuscript. Thanks for cooperation. There are still two minor comments:
We thank the Reviewer for taking the time to review the manuscript a second time and have addressed the minor comments below.

1. Please discuss potentially problems in using ICD-9 instead of ICD-10.
We have discussed the potential problems of using ICD-9 instead of ICD-10 in the revised manuscript.

2. Please add information's about variables which were controlled (age, age of onset, gender, ethnicity, marital status, education, employment, co-morbid psychiatric disorders and hospitalization history) in mediation analyses. Are these variables significant in mediation analyses?
We thank the Reviewer for this suggestion. We have included information on the controlled variables in each of the separate mediation analyses in a supplementary table, as this is not the main focus of the manuscript. However we do acknowledge the importance of controlling for these variables for the purpose of reducing their confounding effects, if any, on the variables of interest. We hope the Reviewer is agreeable to this.