Author’s response to reviews

Title: Prevalence and psychometric screening for the detection of Major Depressive Disorder and Post-Traumatic Stress Disorder in adults injured in a motor vehicle crash who are engaged in compensation

Authors:

Rebecca Guest (rebecca.guest@sydney.edu.au)
Yvonne Tran (yvonne.tran@sydney.edu.au)
Bamini Gopinath (bamini.gopinath@sydney.edu.au)
Ian Cameron (ian.cameron@sydney.edu.au)
Ashley Craig (a.craig@sydney.edu.au)

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Reviewer reports:

Whitney Scott (Reviewer 1): This manuscript reports on the use of the DASS and IES as screening tools for major depression and PTSD in a sample of 109 participants who have made a compensation claim following a motor vehicle injury. The data are from a baseline assessment as part of an RCT. The results provide screening cut-offs for identifying people at risk of major depression and PTSD. The data are of potential interest to those working in the area of injury and compensation. However, several important issues in the study design limit the usefulness of the findings.

Introduction

1) The authors outline a number of relevant populations in which the DASS has previously been validated. It would be helpful if the authors could explicitly describe the unique features of the compensation context that necessitate examination of the psychometric properties of the DASS in a sample seeking compensation.
Response: Thank you for this comment. The authors have outlined in the introduction (Page 5; Paragraph 2) that diagnostic interviews are less desirable in public health/compensation settings because they increase assessment time substantially and involve complex decision pathways by specifically trained professionals. These factors make them expensive for large populations such as compensation populations. A widely used psychometric tool is therefore required which is easily administered either by health professionals collaborating with insurer case managers, with results easily understood by those without clinical psychology training, the aim being to detect reliably disorders such as MDD. To explain in more detail the compensation context, additional information has been added to this paragraph which now reads:

“The compensation setting involves large populations of physically injured MVC claimants, managed by time restricted case managers not trained in clinical diagnoses or assessments. This necessitates their use of easily administered and time efficient psychometric tools to determine outcomes such as psychological distress that could be easily understood by these case managers.”

2) Why was the DASS chosen as a screening tool when a diagnosis of Major Depressive Disorder was the benchmark? Why was a more specific depression screening measure, such as the PHQ-9, not preferred?

Response: Thank you for this comment. We are very familiar with the PHQ-9 as a specific screen for depression. However, we have opted for the DASS-21 in this instance. The DASS-21 was chosen over more specific screening measures such as the PHQ-9 or CESD-R for several reasons. The study reported in this paper is part of a series of ongoing large competitively funded studies investigating recovery of physical and psychological injury following a road crash, such as for example, the efficacy of brief psychological interventions for the management of psychological distress of those who have been physically injured in a MVC and are engaged in compensation. The DASS-21 has been widely used around the world as a psychometric screen and has substantial documented validity and reliability data available (except of course, for people experiencing physical injury in a road crash and in compensation). The DASS-21 was chosen as one of the screens in these studies so it is important for us to have sensitivity and specificity for detecting psychological disorder for this tool. This paper, if accepted, will therefore be widely cited when results of these studies are published in coming years. We also believe this information will be of interest to other researchers, as stated by this reviewer. Another benefit of using the DASS-21 is that it provides more variability and information than a specific tool like the PHQ-9, and therefore has potential as a screen for other forms of distress like PTSD (which in fact, the DASS-21 anxiety domain does have as discussed in the paper). Therefore, we have opted to use the total DASS-21 score as it provides larger variability than a PHQ-9 would and it also provides an option to use the depression, anxiety and stress scales individually or as a total score. A more specific tool may well have resulted in the loss of
valuable information. The following has been added to the paper (Page 6, paragraph 2) to make this point clear:

“The DASS-21 was chosen as the preferred screen for MDD rather than a more specific screen like the self-report Patient Health Questionnaire-9 [Kroenke], because the DASS-21 is widely used in clinical settings, it has substantial data available on its validity and reliability, and it provides broader information about mood, anxiety and levels of stress. Further the DASS-21 …….”

Methods

3) Are the eligibility criteria reported the same as those used for the full RCT from which the current data were drawn? If not, it would be useful to report the full eligibility criteria for the trial and any reason for non-participation which could help the reader interpret the relatively low recruitment rate (43.2%).

Response:- Thank you for this comment. We confirm that the eligibility criteria reported is the same as those used for the full RCT from which the current data were drawn. In regard to the 43.2% participation rate, additional information has been included after this sentence (Methods Section; Page 9; Paragraph 2) which now reads:

“Reasons for non-consent included i) assistance not required, ii) not enough time to devote to the intervention, iii) too much pain, iv) advice from lawyer.”

4) "These included age, sex, education, pre-MVC work status, and marital status." This is not a complete sentence.

Response:- Thank you for this comment. This sentence has been re-worded for grammatical correctness (Methods – Assessment, Paragraph 1; Page 10, Para 2) and now reads:

“Demographic assessment included age, sex, education, pre-MVC work status, and marital status.”

5) The authors describe that the DSM-5 criteria for MDD and PTSD were used as the "gold standard" against which the DASS and IES screening measures were evaluated. However, this is misleading, as the gold standard is a diagnostic clinical interview conducted by a trained professional applying these criteria and making a clinical judgment. The use of self-reported symptoms of DSM-5 criteria is not the same as a diagnostic interview.
It is unclear, for example, how it was judged that the depression episode was not attributable to other conditions such as bereavement or substance abuse. A typical diagnostic interview for depression would also need to rule out any contributing medical conditions or medications. Use of clinical reasoning by a trained professional conducting the interview is particularly important in an injury context, as the presence of post-injury physical symptoms can mirror the somatic symptoms of depression, which could inflate prevalence rates if not accurately accounted for. Likewise, the presence of a history of mania also needs to be ruled out for diagnosis of depression. It is not clear that these diagnostic issues could have been adequately judged using the self-report assessment described in this study. Therefore, it does not appear that a "gold standard" benchmark was used.

Response: Thank you for this comment. We agree a “gold standard” face to face interview was not used in this study as mentioned by the reviewer. The reason is that participants were widely dispersed across the state of NSW, and it was impractical to conduct DSM 5 interviews face to face. However, research has shown that computer/online assisted psychiatric interviews are not less effective than face to face interviews in gathering accurate diagnoses [43]. Therefore, an online assessment strategy was used. Despite this, the authors agree that a DSM-V gold standard rating is associated with a clinical face to face interview process conducted by a trained professional. It should be noted that the researcher conducting the DSM 5 assessment of MDD and PTSD is a trained clinical psychologist who regularly conducts DSM face to face interviews. Further, The authors note that we have available an extensive suite of information in the assessment regime capable of providing further information about a participant’s diagnosis if required, such as alcohol/drug use, injury characteristics, pain ratings, previous mental health history, medication history. This allows us to make a satisfactory diagnosis if this additional information is needed. Also, we are confident in the diagnoses as (i) participants experienced a MVC in the previous few months and this was verified as they have lodged a claim for a physical injury in the road crash, and (ii) we have asked about other life events that may have distressed them since the crash. Arguably, there is also a chance that even in a clinical setting in a DSM face to face interview, important information can be missed during the interview, even though efforts are made to ensure appropriate detail has been collected. The following text has been added to explain better our decision to conduct DSM 5 interviews online. And has been noted:-

i) In text under the Methods – Assessment – Page 11; Paragraph 4 which now reads:-

“DSM-5 criteria for MDD and PTSD were used for determining the sensitivity and specificity of the DASS-21 and IES-R.”

ii) and also in the limitations section on Page 20, para 2, which now reads:-
“Whilst acknowledging that the gold standard rating for DSM-5 clinical interview is based on face to face clinical assessment by a trained professional, evidence suggests computer assisted self-report strategies are effective for diagnosis [Perlis, 2004] and further, substantial information in our diverse suite of assessments were available if a diagnosis of MDD or PTSD required clarification.”

Results

6) Specificity is particularly low for the IES (48.9-61.4).

Response:- Thank you for this comment. Please see response below under next comment regarding IES-R specificity results.

Discussion

7) Further discussion of the low specificity is needed for the IES. This is particularly important given the costs associated with over-treatment of people who do not actually have PTSD (both to the system, and taking resources from people that actually have PTSD). Given the relatively lower prevalence of PTSD as judged by the IES (in comparison to MDD), it might be reasonable to use the IES as a screen for the need for further diagnostic interview rather than as a screen for treatment provision. Such a strategy could increase the specificity of PTSD diagnoses and could then better match people with treatment, while only requiring a full diagnostic interview for approximately 20% of the population, if the current data are accurate.

Response:- Thank you for this comment. The authors agree, that in comparison to the other sensitivity/specificity ratings, the IES-R specificity is lower. We have already indicated in the text that errors will exist despite best efforts and the goal is always to reduce the frequency of errors for both clinical and public health reasons (Discussion, Page 19, Paragraph 2). It is noted that our priority was on detection in order that no one who needed treatment was missed, and this is always going to be at the cost of error in terms of lower specificity. However we also agree that in reference to the IES-R and screening for PTSD, that this should perhaps utilised best as a screener for further enquiry or assessment. We have already noted in this same paragraph, that further assessment is warranted once a certain level of specificity is reached, however we have added information (bottom of page 19) to emphasise this, and now reads:-

“It is therefore proposed that for those scoring close below the cut-off score, there is some justification to conduct further assessment, such as referral to clinically trained professional for gold standard interviews.”
"The findings of this study provide assessment or screening pathways that have the potential to reduce risk of psychological disorder in people sustaining injury in an MVC and engaged in compensation." This is somewhat misleading. The screening cut-offs in and of themselves will not reduce risks of psychological disorder in this population. Rather, they provide a starting point to potentially initiate treatment. It should be explicitly stated that screening initiatives should only be implemented when appropriate, empirically validated treatments are in fact available for those who screen positive.

Response:- Thank you for this comment. The authors agree that this section needed clarification for improved understanding. Under the heading, ‘Conclusions’, Page 21, paragraph 2, the sentence now reads:-

“Through criterion validation analysis of a compensation population, the findings of this study provide assessment or screening pathways that have the potential to provide a benchmark for investigating the need for psychological intervention in people sustaining injury in a MVC and engaged in compensation. People who screen positively can be referred to appropriately and clinically trained professionals for further assessment, and if this also proves positive, the person can then be provided with information about appropriate and available evidenced-based treatment.”

Maria Papadakaki (Reviewer 2): Thank you for the kind invitation to review this manuscript on the psychological burden of MVC survivors. This is an interesting attempt to explore the validity of two scales. My comments are shown below.

Introduction

1. The study aims to explore the validity of two scales and the manuscript is focused on these aspects. I think that the title is not very representative of the aims.

Response:- Thank you for this comment. The authors agree that the title needed clarification to better reflect the paper’s aim. The title has been changed to:-

“Prevalence and psychometric screening for the detection of major depressive disorder and post-traumatic stress disorder in adults injured in a motor vehicle crash who are engaged in compensation”
2. The following sentence needs some scientific references/justification.

"Problems of detection in psychometric screens include the propensity t…..If a diagnostic strategy has limited sensitivity and specificity, then public health and clinical consequences are problematic."


3. "The DASS-21 has not been used to detect MDD in adults who have experienced MVC-related physical injury and engaged in compensation". ...." It is not clear why the authors chose one scale that has not been previously used in MVC research (although earlier they mentioned many OTHER scales used in MVC research). Justification is needed.

Response:- Thank you for this comment. Please see our response to Reviewer 1 point 2 on this issue.

4. The first objective of the study is not justified. Why is calculation of the prevalence of MDD and PTSD necessary and important? Is it a missing issue? Please justify with adequate evidence.

Response:- Thank you for this comment. The authors note that this study is part of a much larger study investigating intervention strategies for managing the psychological distress of those who have been physically injured in a MVC and engaged in compensation. It is important to understand how many people who experience a physical injury also experience psychological distress to inform those who are managing claims and allocating resources such as insurance companies. In this case, we are investigating psychological distress and trying to determine the percentage who have MDD/PTSD – typical psychological outcomes for those who experience trauma such as a MVC. We have stressed the clinical and health importance of knowing the prevalence of psychological disorder following a road crash in the Background section in paragraph 2, citing excellent research such as that by Reviewer 2 on psychological disorder prevalence rates. We then discussed rates in Paragraph 3 in the context of compensation. We made the point that we know of no published data on such rates in people experiencing physical injury following a road crash and engaged in compensation. This is how we justified the inclusion of data on rates of MDD and PTSD. To make our aims on this point clearer, on Page 7, last paragraph, we have changed the first aim to:

“(i) given the lack of published information, the prevalence of MDD and PTSD was calculated in a sample of adults who have experienced an MVC and engaged in compensation; ii) to
investigate the criterion validity of the DASS-21 and IES-R for measuring MDD and PTSD……..”

5. The second objective is not well justified (..investigate the validity of the DASS-21 and IES-R for measuring MDD and PTSD in adults physically injured in an MVC and engaged in compensation). Why investigation of the validity of MDD and PTSD necessary and important? Is it a missing issue? Please justify with adequate evidence.

Response:- Thank you for this comment. Additional information has been added to the Introduction regarding why it is important to validate the diagnosis of MDD and PTSD (DSM-5) with a screening tool for compensation settings. On Page 5, In Paragraph 4 of the Background, an additional sentence has been added:-

“The compensation setting involves large populations of physically injured MVC claimants, managed by time restricted case managers not trained in clinical diagnoses or assessment. This necessitates the use of easily administered and time efficient psychometric tools to determine outcomes such as psychological distress that could be easily understood by these case managers.”

Methods

6. The setting is not well defined. Where did this study take place? Where participants were recruited from - how many sampling units were involved? What was the total population of eligible participants in this setting (fulfilling the inclusion criteria) for the two year recruitment period? What percentage of eligible participants were sampled for the current study?

Response:- Thank you for this comment. We have added more detail to make recruitment and sampling clearer. Please see Page 9, Paragraph 2 of the Method – Recruitment/Participants section, the setting and recruitment sites have been included,

“The 109 adults who consented to participate were recruited through three compulsory third party (CTP) insurers (two in New South Wales, Australia, and one in Victoria, Australia), over a period of almost two years (from July 2015 to May 2017). Case managers in each of the insurer companies introduced the research to those meeting inclusion criteria, and the names, telephone number and email address of those who were interested were sent to the researchers to discuss the research in more detail and gain consent. Once consent was achieved, the participant was randomized into the study.
For information regarding population and sampling numbers see the following: “Altogether, 411 persons who met inclusion/exclusion criteria were approached by case managers, with 252 (61.3%) indicating willingness to discuss the study with the researchers……..recruitment rate of 43.2% (109/252).

Inclusion and exclusion was also discussed in Paragraph 1 of this section.

7. I would like to see a flow chart of the recruitment process with eligible and non-eligible cases and those excluded from the study for various reasons. This is always helpful.

Response:- Thank you for this comment. We have provided a statement (see directly above) that indicates the total number approached and also those who agreed to consent. While a flow chart is a nice idea, we feel it may really be overkill to include another figure just for a few recruitment figures. The authors also note that this is part of a larger study investigating brief psychological interventions aimed at reducing the distress of those physically injured in a MVC and engaged in compensation. To clarify this, an additional sentence has been added to Page 8, Paragraph 2 under the ‘Method – Recruitment and Participants’ heading which now reads:-

“This study is part of a larger study investigating brief psychological interventions aimed at reducing the distress of those physically injured in a MVC and engaged in compensation.”

Additional information has been added to Page 9 Paragraph 2 in the Method-Recruitment/Participants section regarding the reasons for non-consent. This sentence now reads:-

“Reasons for non-consent included i) assistance not required, ii) not enough time to devote to the intervention, iii) too much pain, iv) advice from lawyer not to receive assistance.”

8. What are the time restrictions for lodging a compensation claim and under which criteria? How was "3-4 months of the MVC" decided as an inclusion criterion? Information already provided on this could refer to a certain regulatory framework.

Response:- Thank you for this comment. To clarify restrictions on lodging a claim the following has been added to the paper on pages 8, paragraph 1:

“People are eligible to lodge a claim if they are injured as a result of the MVC and, in NSW, are not at fault (with some limited exceptions for at fault drivers where they can claim up to $5,000 Australian for injury related costs) [20]. Victoria has a no fault CTP scheme, where compensation can be given regardless of fault status. If eligible, the injured person can make a claim for a range of benefits including medical treatment and rehabilitation costs, care costs, economic losses, as well as payments for pain and suffering. Claimants must have reported the
accident and injuries within 48 hours of the road crash, and lodge the CTP claim within 6 months from the date of the crash.”

The 3-4 months was decided as an inclusion criteria as most people will have lodged their claim by this time, and we did not want claimants who had been injured for longer than 4 months due to psychological disorder chronicity issues. We added the following to page 8 and 9 in the inclusion criteria to clarify this:

“(i.e. we wanted to reduce chances of recruiting claimants who had developed a chronic psychological disorder, arguably, more possible by 5-6 months post road crash), and ii) English speaking. Exclusion criteria consisted of sustaining catastrophic or complex injuries, which according to NSW guidelines defined by the Lifetime Care and Support Authority, include injuries………..

9. "catastrophic or complex injuries" are not defined based on widely-stablished definitions. How was this decided? What percentage of injured MVC patients are behind this exclusion criterion? Are there any biases identified?

Response:- Thank you for this comment. In NSW, Australia, catastrophic injuries include severe traumatic brain injury (ie significant impact to the head resulting in extended coma), spinal cord injury, severe and extensive burns to the body, amputations and blindness (www.lifetimecare.nsw.gov.au). Non-catastrophic are those which are non-permanent and usually less incapacitating. This definition of catastrophic versus non catastrophic injury is defined by the Lifetime Care and Support Authority in NSW, Australia which provides lifetime care for those with severe injuries. To clarify, the reference has been added to this sentence and additional information (bottom of page 8) has been included to recognise the organisation which sets the guidelines for catastrophic versus non-catastrophic in NSW, Australia. The sentence now reads:-

“Exclusion criteria consisted of sustaining catastrophic or complex injuries, which according to NSW, Australian guidelines set by Lifetime Care and Support Authority include injuries such as spinal cord injury………..or severe traumatic brain injury [34].

The researchers were funded to determine the benefits of brief psychological email delivered interventions only for people with non-catastrophic injuries. We are not aware of any bias as a result of this decision.

10. DSM-5 criteria were assessed via "a secure online site"? What about the psychiatric assessment that the authors used in the introduction to justify the necessity of their study regarding the investigation of validity of the two scales?
Response:- Thank you for this comment. In the Introduction/Background the authors argue that DSM-5 is a gold standard structured interview used for diagnosing psychological disorders. However we go on to argue that this is not desirable for use in public health/compensation settings due to the time and cost involved. It was therefore our aim to determine the sensitivity and specificity of easy to use screens that could be validated against a DSM-5 diagnosis in compensation settings. Please also see comments to Reviewer 1 points 2 and 5. Additional information has been added to Paragraph 4 of the Introduction/Background on Page 5 to clarify why a screening tool is more desirable, and now reads:

“The compensation setting involves large populations of physically injured MVC claimants, managed by time restricted case managers not trained in clinical diagnosis of assessments. This necessitates the use of easily administered and time efficient psychometric tools to determine outcomes such as psychological distress that could be understood by these case managers.”

See also comments to Reviewer 1 point 5.

11. And what about the assessment of DSM-2 criteria assessed for the previous 2 weeks in persons injured 3-4 months before?

Response:- DSM-5 assessment was followed exactly as required by the DSM-5 guidelines.

Discussion

12. The authors need to employ recent literature and more literature to discuss their findings in relation to MVC research, not general studies on depression and stress in other populations.

Response:- Thank you for this comment. Paragraph 2 in the Background covers recent research of those sustaining physical injury and also psychological distress in a road crash. The paper is already quite large so we believe this literature review was sufficient? We have however added one paper published in 2016 to the Discussion (page 17; Paragraph 1 of Discussion), on costs and economic losses sustained in a MVC (Papadakaki et al., 2016).

13. The first objective of this study is not discussed in comparison to other studies on this filed.

Response:- Thank you for this comment. The first paragraph of the Discussion discusses the first aim of our study being the prevalence of MDD and PTSD in this population, and compares it to previous recent research- the recent studies by Papadakaki et al. (2017) and Craig et al. (2017). See also point 4 for Reviewer 2.
14. The authors discuss the effect of compensation on depressive and stress symptoms and the effect of relevant interventions. However, their study design does not allow any conclusions on that aspect.

Response: Thank you for this comment. A new sentence has been added in the Conclusion on Page 21 addressing the direction toward appropriate interventions for those screening positively for psychological distress. This sentence now reads:

“Through the establishment of criterion validity for screening psychological disorder in a compensation MVC-injured population, the findings of this study provide potentially reliable benchmarks for determining the need for psychological intervention in people sustaining injury in a MVC and engaged in compensation. People who screen positively from such screeners, with possible referral to clinically trained professionals for further assessment, can then be provided with the appropriate and available evidenced-based treatment.”

15. Criterion validity is only one element of validity. There are other tests/procedures to explore validity and reliability of a tool and this should be acknowledged among the limitations.

Response: Thank you for this comment. The authors agree that criterion validity is only one methodology of testing validity and reliability. An additional sentence has been added to the end of the limitations section on page 21 which now reads:

“In regard to the screening tools, there are several other avenues for determining validity and reliability such as test-retest, split-half and alternative forms procedures. This study only investigated criterion validity.”

16. The authors should further avoid claiming in the Discussion section that the two scales are "valid" based on their findings - but they should be specific regarding the validity aspect they explored as well as specific regarding the population that this validation study applies to (only those in compensation procedures were involved, etc).

Response: Thank you for this comment. The authors have been careful to include the word ‘criterion’ before reference to validity in the Discussion and Conclusion, as well as being specific with the ‘compensation population’. All references to these have been amended if relevant.
17. The authors should acknowledge the limitations raised by their study design as well (cross-sectional), the sampling design, the recruitment process, the inclusion/exclusion criteria they employed, etc.

Response:- Thank you for this comment. The authors have acknowledged limitations in reference to the biased sample given all are drawn from a compensation population and the recruitment style being an opt-in with potential bias and their impact on the occurrence of MDD and PTSD. An additional comment has been added in regard to exclusion/inclusion criteria and potential bias on Page 20, the last paragraph of the Discussion which now reads:-

“…….Also, the recruitment style used will result in bias, as well as the potential restrictions enforced by the exclusion/inclusion criteria. Any research…………….bias problems. The impact of these limitations on the occurrence rates of MDD…………needs to be considered.”

18. Overall, the authors assume that this is a validation study. However, the conclusions are not focused on the findings and the implications of the validation instead they refer to the impact of the study on screening practices, which does not fit with the focus of the introduction.

Response:- Thank you for this comment. The authors agree that the conclusion needed additional information in relation to the findings on validation. Additional information has been added under the ‘Conclusion’ heading on Page 21 and 22 to reflect this and now reads:-

“Through the establishment of criterion validity for screening psychological disorder in a MVC-injured population, the findings of this study provide potentially reliable benchmarks for determining the need for psychological intervention in people sustaining injury in a MVC and engaged in compensation. People who screen positively can be referred to appropriately and clinically trained professionals for further assessment, and if this also proves positive, the person can then be provided with information about appropriate and available evidenced-based treatment.”