## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (**http://bmjopen.bmj.com/site/about/resources/checklist.pdf**) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

## ARTICLE DETAILS

| **TITLE (PROVISIONAL)** | Validation of the Transition Readiness and Appropriateness Measure (TRAM) for the Managing the Link and Strengthening Transition from Child to Adult Mental Health Care in Europe (MILESTONE) study |
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| **AUTHORS** | Santosh, Paramala; Singh, Jatinder; Adams, Laura; Mastroianni, Mathilde; Heaney, Natalie; Lievesley, Kate; Sagar-Ouriaghli, Ilyas; Allibrio, Giovanni; Appleton, Rebecca; Davidović, Nikolina; De Girolamo, Giovanni; Dieleman, Gwen; Dodig-Ćurković, Katarina; Franić, Tomislav; Gatherer, Charlotte; Gerritsen, Suzanne; Gheza, Elisa; Madan, Jason; Manenti, Lidia; Maras, Athanasios; Margari, Francesco; McNicholas, Fiona; Pastore, Adriana; Paul, Moli; Purper-Ouakil, Diane; Rinaldi, Francesco; Sakar, Vehbi; Schulze, Ulrike; Signorini, Giulia; Street, Cathy; Tah, Priya; Tremmery, Sabine; Tuffrey, Amanda; Tuomainen, Helena; Verhulst, Frank; Warwick, Jane; Wilson, Anna; Wolke, Dieter; Fiori, Federico; Singh, Swaran |

## VERSION 1 - REVIEW

| **REVIEWER** | Gillian Mulvale, Associate Professor Health Policy and Management McMaster University, Canada |
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| **REVIEW RETURNED** | 22-Sep-2019 |

| **GENERAL COMMENTS** | Excellent and much needed work. Please see very minor editorialcomments on attached file.<br><br>The reviewer provided a marked copy with additional comments. Please contact the publisher for full details. |
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| **REVIEWER** | Janet Mcdonagh<br>University of Manchester |
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| **REVIEW RETURNED** | 04-Oct-2019 |

| **GENERAL COMMENTS** | This paper reports the validation of a new transition readiness measure for young people moving from child to adult mental health services.<br>1. The language of transition in the literature continues to get easily confused and there are times in this paper when it is not clear as to whether the lengthy process of transition is being discussed or the event of transfer. The paper should be revised with this in mind<br>Eg is this new measure a transfer readiness measure or a transition |
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| | readiness measure?<br>eg what does “post transition” mean? It is generally accepted that the process of transition continues after the event of transfer mirroring young adult brain development into the third decade but is also the phase of transition which is under-researched (see Hart LC, Patel-Nguyen SV, Merkley MG, Jonas DE. An evidence map for interventions addressing transition from pediatric to adult care: A systematic review of systematic reviews. J Pediatr Nurs. 2019 Jun 17;48:18-34.<br><br>Eg what does the “transition boundary” mean – is this no the transfer boundary with the process of transition occurring both before and after transfer?<br>Eg Page 7 “ whether transition is appropriate and whether the young person is ready for it” – does this refer to whether transfer is appropriate? The process of transition starts much earlier in adolescence and is more about developmentally appropriate care as the young person grows up and the gradual acquisition of the skills needed during this process. The literature of the trajectories of skill acquisition over time supports this and highlights the need for assessment of transition readiness throughout this process – both before and after transfer.<br>2. There are a multitude of transition readiness measures being developed and it would eb interesting to read as to why another one is needed particularly as this new measure has not yet been compared with another such measure.<br><br>Introduction<br>3. The authors refer to “and assessment of transition readiness and appropriateness of young people” – what do they mean by appropriateness of young people? Should this read – appropriateness of transfer?<br>4. Only UK transition recommendations are referenced. In view of the international readership, recommendations from other countries should be include in addition.<br>5. References 1, 4-6, 8 are over a decade old and much has happened since so more up to date research should be referenced<br>Methods<br>6. The subscales are generally very negative. Were the actual questions phrased more positively in order to promote positive youth development? Risk factors are included but what about protective factors?<br><br>7. The young people voiced that “life events” should be taken into account and they highlight an important point which is worthy of further discussion. Health transition is only one of many life transitions occurring at this time and ideally health transition readiness measures should take these into account but do not always succeed in doing so.<br><br>Page 14<br>8. I presume when it is stated that the TRAM was completed by the various groups they completed the respective version of the TRAM…? This should be clarified for the reader.<br>9. What age range were the adolescents involved? Were young people from all developmental stages of adolescence and young adulthood involved ie 10-24 years? If not, this needs to be discussed as a limitation as health transition should cover from early adolescence through to the third decade.<br>10. Will one adolescent version be developmentally appropriate for |

|  | all the stages of development?<br>Page 20<br>11. The finding that “knowledge of accessing services” was more important than other items. This is echoed in the wider transition literature as a key transitional skill which is not always addressed in routine clinical care. I.e. learning who to call for what and when and where to go if needed!<br><br>12. The authors state that one barrier is that young people are not ready to act as an independent adult. This is further evidence to support the 3rd phase of transition which takes place in young adult hood when the brain is still developing i.e. they truly are not yet adult! It is often the services and practitioners who forget that these are still developing young people. |
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| **REVIEWER** | Kyleigh Schraeder<br>University of Calgary, Alberta, CANADA |
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| **REVIEW RETURNED** | 06-Nov-2019 |

| **GENERAL COMMENTS** | Title: BMJ Open – bmjopen-2019-033324<br>Validation of the Transition Readiness and Appropriateness Measure (TRAM) for the Managing the Link and Strengthening Transition from Child to Adult Mental Health Care (MILESTONE) study<br><br>Overall Comments<br>This is an important study and a key step forward for addressing a gap in what we know about transition readiness of youth with mental health issues who require adult services. This study describes the development and validation of a measure: Transition Readiness and Appropriateness Measure (TRAM). The authors describe the purpose of the TRAM is to: (1) determine if the young person is ready (“readiness”), and (2) determine if transition to adult mental health care is needed (“appropriate”). A strength of this study is the use of a survey development framework for PROMs (US FDA PROM); more details on this framework and how the authors used it to guide measure development are needed. My major concern was the lack of detail on important aspects of survey development: item generation, pre-testing and pilot testing, formatting/scaling of questions, clarity testing, etc. Given the lack of literature in this area, I was curious to know how authors defined their constructs of transition “readiness” and “appropriateness” based on their expert panels and literature review. The target population for the TRAM was not clear to me. The authors state adolescents (“pre-transition”) and young adults (“post-transition”) were involved in validation. The rationale for including individuals post-transition was not obvious me. Significantly more details on who completed the TRAM, and who the TRAM is designed for (or not), are needed (e.g., adolescents’ age, types of diagnoses, length/type of CAMHS received, etc). Without this information, the interpretation and clinical utility of the TRAM are limited in my opinion. Overall, I think this study has the potential to make a novel contribution to the transition literature. More details on measure development would strengthen this paper.<br><br>Specific comments<br>Title/Abstract<br>1. Title in typo after (TRAM) “for the Managing the Link” |
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| | 2. Unclear what MILESTONE refers to or if this is an acronym for something – consider removing from title<br>3. Conclusion in abstract – seems generic to transitions in care in general, not specific to mental health<br>4. Would be helpful to define pre- and post-transition age windows in abstract<br><br>Introduction<br>1. The authors refer to the “service transition boundary”. A clearer definition how they are defining this boundary is needed given wide variation in the literature (ages 12 to 25). For chronic physical health conditions, the process of transition is recommended to start at age 12.<br>2. Nice description of transition as a process. Some discussion on how this process differs for young people with mental health problems vs those with chronic physical health conditions would be helpful. Specifically, the need for long-term supports for young people with mental health problems (e.g., depression, anxiety) is not as clear compared to young people with chronic physical health conditions (e.g., diabetes). Not all young people will require a transition to adult mental health services. This was likely considered for defining the “appropriateness” of transition (or whether transition is needed)<br><br>See: Schraeder KE, Reid GJ. Who Should Transition? Defining a Target Population of Youth with Depression and Anxiety That Will Require Adult Mental Health Care. J Behav Heal Serv Res. 2017;44(2).<br><br>3. Further details on CAMHS and AMHS would be helpful – what types of services do these include in the UK? I expect AMHS is not inclusive of services provided by GP? A small subset of youth will be eligible for specialized adult mental health services (e.g., adult psychiatrists), many are discharged back to their GP (Islam 2016).<br>4. Data on the %s who receive CAMHS and AMHS, as defined in this study, would be helpful to give context to target population of TRAM.<br>5. Line 33-34 – “for assessing whether transition is appropriate and whether the young person is ready for it”. Please clarify this transition - to AMHS? (See comment 3).<br>6. Line 34 – “various assessments of improving transition outcomes have been developed”. The authors cite several measures which is excellent. This might be better in a Table so reader can easily know what measures are being referred to here, and to highlight the gap for mental health settings. Were these the ‘standard scales’ used to assess validity? Please clarify.<br>7. Line 45-46 – in mental health it seems that certain components might be more useful than others (to assess readiness?). Please cite literature and expand on this.<br>8. Mention of the clustered RCT, and the TROM, could be saved for methods or discussion and seems to distract from the focus of this paper on measure development.<br><br>Methods<br>9. I found the organization of this section difficult to follow. Understandably there are a lot of steps involved in measure development and validation. It might be helpful for authors to separate the methods used for Scale Development from the Validation study to improve the organization. For a great example of what I mean (and relevant to your study!), please see: |

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| | Tobon JI, Reid GJ, Goffin RD. Continuity of Care in Children's Mental Health: Development of a Measure. Adm Policy Ment Heal Ment Heal Serv Res. 2014;41(5):668-686.<br>10. Great that PROM guidelines followed. Please clarify how this was followed or how it guided the phases.<br>11. Please clarify literature reviewed and expert panel and focus group themes. If the data from the focus groups is published elsewhere please cite, otherwise more details on qualitative findings would be helpful.<br>12. Please clarify characteristics (e.g., age, diagnoses) for adolescents/young adults who participated in validation. as well as demographic characteristics of parents and providers CAMHS and AMHS (e.g., training, professional roles, etc.).<br>13. Clarify what the 'standard scales', or the other measures participants completed, to assess validity. I see these are mentioned in Results but could be described in detail here.<br>14. Several details of the measure development seem to be missing from this section: methods for formatting and scaling/pilot testing, sampling/recruitment methods for panel/focus groups/validation, a priori hypotheses for validation, etc.<br>15. Definitions of types of validity assessed could possibly help to organize this section (eg construct, convergent, discriminant etc). I think criterion (outcome) validity is being assessed in a separate follow-up paper?<br>16. Analyses section missing? More details needed on reliability calculations/cut-offs, preliminary analyses (initial item analysis), CFA, etc. I see this is weaved later into Results section – might be better to keep all of this together in paper though I'm not sure if there is a perfect solution here.<br>17. I would suggested conducting analyses to assess the responses on the measure to participants' demographic characteristics (not presented in this paper) to see if parent/adolescent responses are related to family structure, SES, child characteristics (sex, age etc).<br><br>Results/Discussion<br>18. More details on the literature review and what types of articles reviewed would be helpful, and how the core structure of TRAM was developed are needed. Is this framework or structure published elsewhere?<br>19. Description of other existing instruments used to assess convergent validity needed for those unfamiliar with them. Interesting why no transition-specific measures (eg TRACK) were used?<br>20. Was discriminant validity assessed using the same instruments for convergent validity? I'm not clear on if this is a standard practice or not.<br>21. It might be helpful to separate results for the adolescent, parent, and clinician versions? Somewhat hard to follow when all grouped together.<br>22. Possible to discuss why removing certain items would improve the Symptoms sub-scale.<br>23. Justification for the EFA on the adolescent version seems reasonable. However I'm not following the statement on Line 26 - The EFA showed that the number of factors were not set for the 'symptoms' and 'factors affecting symptoms' sub-scales, otherwise thenumber of factors were set to two ('overall disruption', 'risk factors' and 'barriers to<br>functioning' sub-scales).<br>24. Did the EFA or CFA confirm that items could be mapped onto "readiness" and "appropriateness"? Did the subscales map onto two |

| | scales for these? I'm not following how these two goals of the TRAM were assessed in the validation.<br>25. The Discussion focuses largely on the TRAM being "different" enough from other transition measures. However, whether the goal of assessing readiness and appropriateness was met should be discussed.<br>26. Strengths and limitations section reads well. The TRAM score summary report with visual graphics sounds interesting. Could this be included in supplementary materials or as a Figure? |
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## VERSION 1 – AUTHOR RESPONSE

Reviewer(s)' Comments to Author:
Reviewer: 1

Reviewer Name: Gillian Mulvale, Associate Professor Health Policy and Management Institution and Country: McMaster University, Canada. Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below

Excellent and much needed work. Please see very minor editorial comments on attached file.
Response: We thank the reviewer for their comment.

Reviewer: 2

Reviewer Name: Janet Mcdonagh Institution and Country: University of Manchester. Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below. This paper reports the validation of a new transition readiness measure for young people moving from child to adult mental health services.

1. The language of transition in the literature continues to get easily confused and there are times in this paper when it is not clear as to whether the lengthy process of transition is being discussed or the event of transfer. The paper should be revised with this in mind Eg is this new measure a transfer readiness measure or a transition readiness measure?

eg what does "post transition" mean? It is generally accepted that the process of transition continues after the event of transfer mirroring young adult brain development into the third decade but is also the phase of transition which is under-researched (see Hart LC, PatelNguyen SV, Merkley MG, Jonas DE. An evidence map for interventions addressing transition from pediatric to adult care: A systematic review of systematic reviews. J Pediatr Nurs. 2019 Jun 17;48:18-34.

Response: We thank the reviewer for their comment. In the context of the MILESTONE Study, transition here is used to describe the transfer boundary and follows on the transfer of care between services, as defined in Singh et al. 2008,Transitions of care from child to adolescent mental health services to adult mental health services (TRACK Study): a study of protocols in Greater London, BMC Health Services Research, 8(135). As indicated below, the term 'transfer boundary' is now used throughout this manuscript. See also the definitions used in Schraeder K & Reid G. 2017. Who should transition? Defining a target population of youth with depression and anxiety that will require adult mental health care. J Behav Heal Serv Res, 44(2).

Eg what does the "transition boundary" mean – is this no the transfer boundary with the process of transition occurring both before and after transfer?

Response: Thank you for your comment. Where relevant, the wording has been updated in the manuscript to reflect this.

Eg Page 7 " whether transition is appropriate and whether the young person is ready for it" – does this refer to whether transfer is appropriate? The process of transition starts much earlier in adolescence and is more about developmentally appropriate care as the young person grows up and the gradual acquisition of the skills needed during this process. The literature of the trajectories of skill acquisition over time supports this and highlights the need for assessment of transition readiness throughout this process – both before and after transfer.

Response: Transition in the manuscript is being used to describe the process of transferring the care from CAMHS to AMHS, which is not always appropriate (e.g. maybe the Young Person needs no further care and is better being discharged back to their GP).

2.There are a multitude of transition readiness measures being developed and it would be interesting to read as to why another one is needed particularly as this new measure has not yet been compared with another such measure.

Response: Thank you for your comment. This point was previously discussed in depth by consortium members during draft reviews of the manuscript. The consensus view was that although there are other measures of transition none can accurately capture the longitudinal aspect of the transition journey in terms of assessing transition readiness. We compared the psychometric properties of the TRAM to another scale that has been used to capture the transition – the HoNOSCA, however, as we allude in the discussion, we found that the TRAM showed moderate to low correlations when compared with other established instruments. This conceptual difference is important as it provides further evidence that a new measure was needed because higher correlations with the HoNOSCA would imply that the TRAM was not adding anything new.

Introduction

3.The authors refer to "and assessment of transition readiness and appropriateness of young people" – what do they mean by appropriateness of young people? Should this read – appropriateness of transfer?

Response: Amended.

4. Only UK transition recommendations are referenced. In view of the international readership, recommendations from other countries should be include in addition.

Response: This has been changed to reflect the picture in the EU, as this is the context of the MILESTONE study.

5. References 1, 4-6, 8 are over a decade old and much has happened since so more up to date research should be referenced

Response: As part of the development and validation process, these references formed part of the core literature on the area and were included in the process to develop the TRAM by the MILESTONE Consortium.

Methods

6. The subscales are generally very negative. Were the actual questions phrased more positively in order to promote positive youth development? Risk factors are included but what about protective factors?

Response: The scale construction followed the FDA guidelines for PRO development. The TRAM questions and response options were developed after multiple focus groups with adolescent patients, their carers/parents, and their clinicians. All items were scored on a Likert scale with the option that identified the 'least' dysfunction being placed as the first response option and the one that identified the most severe or 'negative' option being the last response option. The scoring of protective factors was reversed as would be expected.

7. The young people voiced that "life events" should be taken into account and they highlight an important point which is worthy of further discussion. Health transition is only one of many life transitions occurring at this time and ideally health transition readiness measures should take these into account but do not always succeed in doing so.

Response: Thank you for this point. We have added text to emphasise this point (page 12 of the tracked version).

Page 14

8. I presume when it is stated that the TRAM was completed by the various groups, they completed the respective version of the TRAM…? This should be clarified for the reader.

Response: This has been clarified in the text.

9. What age range were the adolescents involved? Were young people from all developmental stages of adolescence and young adulthood involved ie 10-24 years? If not, this needs to be discussed as a limitation as health transition should cover from early adolescence through to the third decade.

Response: This study was specifically looking at youth that reach the transition boundary when they would be expected to transition from CAMHS services, hence the age range is a narrower one than that suggested of 10-24 years. The youth ranged between 15.3 years and 19.7 years (which is typically the age at which transition from CAMHS services are considered in all the EU countries that participated in the MILESTONE project.

10.Will one adolescent version be developmentally appropriate for all the stages of development?
Response: In the main study, the TRAM was completed by young people with a large range of diagnoses, including neurodevelopmental disorders. We therefore believe the adolescent version is appropriate for the majority of adolescents, except those with severe learning difficulties.

Page 20

11. The finding that "knowledge of accessing services" was more important than other items. This is echoed in the wider transition literature as a key transitional skill which is not always addressed in routine clinical care. I.e. learning who to call for what and when and where to go if needed! Response: This section has been updated in line with some relevant literature sources.

12.The authors state that one barrier is that young people are not ready to act as an independent adult. This is further evidence to support the 3rd phase of transition which takes place in young adult hood when the brain is still developing i.e. they truly are not yet adult! It is often the services and practitioners who forget that these are still developing young people.

Response: We thank you for raising this important point and the text relating to barriers has been revised accordingly.

Reviewer 3: Comments to authors:

Comments:

Reviewer Name: Kyleigh Schraeder Institution and Country: University of Calgary, Alberta, CANADA. Please state any competing interests or state 'None declared': None declared Please leave your comments for the authors belowTitle: BMJ Open – bmjopen-2019-033324 "Validation of the Transition Readiness and Appropriateness Measure (TRAM) for the Managing the Link and Strengthening Transition from Child to Adult Mental Health Care (MILESTONE) study

Overall Comments: This is an important study and a key step forward for addressing a gap in what we know about transition readiness of youth with mental health issues who require adult services. This study describes the development and validation of a measure: Transition Readiness and Appropriateness Measure (TRAM). The authors describe the purpose of the TRAM is to: (1) determine if the young person is ready ("readiness"), and (2) determine if transition to adult mental health care is needed ("appropriate"). A strength of this study is the use of a survey development framework for PROMs (US FDA PROM); more details on this framework and how the authors used it to guide measure development are needed. My major concern was the lack of detail on important aspects of survey development: item generation, pre-testing and pilot testing, formatting/scaling of questions, clarity testing, etc. Given the lack of literature in this area, I was curious to know how authors defined their constructs of transition "readiness" and "appropriateness" based on their expert panels and literature review. The target population for the TRAM was not clear to me. The authors state adolescents ("pretransition") and young adults ("post-transition") were involved in validation. The rationale for including individuals post-transition was not obvious me. Significantly more details on who completed the TRAM, and who the TRAM is designed for (or not), are needed (e.g., adolescents' age, types of diagnoses, length/type of CAMHS received, etc). Without this information, the interpretation and clinical utility of the TRAM are limited in my opinion. Overall, I think this study has the potential to make a novel contribution to the transition literature. More details on measure development would strengthen this paper.

Response: A full in-depth description of the development of the measure is given in the development paper, which is currently in submission. TRAM is for everyone before they reach the transition boundary, no matter the diagnosis, age or length spent in CAMHS, and a clarifying line has been added. Post-transition individuals were involved to see what they would have found useful.

Specific comments

Title/Abstract

1. Title in typo after (TRAM) "for the Managing the Link"

Response: This is not a typo, but the name of the overall study as agreed by the MILESTONE Consortium.

2. Unclear what MILESTONE refers to or if this is an acronym for something – consider removing from title

Response: Thank you for this point, however, the authors feel that in this instance removing the acronym MILESTONE would be counterproductive to the scope of the manuscript. MILESTONE is the 'Managing the link and strengthening transition from child to adult mental health care' study, and is the name of the overarching project that was funded.

3. Conclusion in abstract – seems generic to transitions in care in general, not specific to mental health

Response: This has been clarified

4.Would be helpful to define pre- and post-transition age windows in abstract

Response: the transition boundary age in Europe has been added to the abstract.

Introduction

1. The authors refer to the “service transition boundary”. A clearer definition how they are defining this boundary is needed given wide variation in the literature (ages 12 to 25). For chronic physical health conditions, the process of transition is recommended to start at age 12.

Response: The transition boundary age has been added alongside the existing definition of transition in this paper.

2. Nice description of transition as a process. Some discussion on how this process differs for young people with mental health problems vs those with chronic physical health conditions would be helpful. Specifically, the need for long-term supports for young people with mental health problems (e.g., depression, anxiety) is not as clear compared to young people with chronic physical health conditions (e.g., diabetes). Not all young people will require a transition to adult mental health services. This was likely considered for defining the “appropriateness” of transition (or whether transition is needed)

See: Schraeder KE, Reid GJ. Who Should Transition? Defining a Target Population of Youth with Depression and Anxiety That Will Require Adult Mental Health Care. J Behav Heal Serv Res. 2017;44(2).

Response: Thank you for your comment. While other aspects of the manuscript have been revised accordingly and Schraeder et al. (2017) has now been cited in the manuscript, we feel that adding additional text regarding how the this process differs for young people with mental health problems versus those with chronic physical health would deviate from the core points in the manuscript regarding transition related to those with complex psychopathology. Nevertheless, we have already mentioned that a detailed review of the literature considered aspects of transition in both mental and physical health and resulted in a list of 64 items of potential importance, grouped into three main domains - diagnosis, risk and functioning - forming the core structure of the TRAM. This aspect of the TRAM will be alluded to in the protocol development manuscript that is currently in submission and we would like to avoid substantial overlap here.

3. Further details on CAMHS and AMHS would be helpful – what types of services do these include in the UK? I expect AMHS is not inclusive of services provided by GP? A small subset of youth will be eligible for specialized adult mental health services (e.g., adult psychiatrists), many are discharged back to their GP (Islam 2016).

Response: This has now been addressed on page 6 of the tracked version.

4. Data on the %s who receive CAMHS and AMHS, as defined in this study, would be helpful to give context to target population of TRAM.

Response: Detailed exploration of transition trajectories (common care pathways for YP leaving CAMHS) is the focus of a separate paper. As the % who eventually go on to AMHS is itself a key finding, which warrants focus and discussion, we feel it more appropriate to report it in the trajectories paper rather than here. To aid understanding of sample, the demographic and clinical characteristics of YP (CAMHS service users) who completed the TRAM are given in supplementary Information (Tables 1 and 2).

5. Line 33-34 – “for assessing whether transition is appropriate and whether the young person is ready for it”. Please clarify this transition - to AMHS? (See comment 3).

Response: Amended, this transition is to AMHS, as per the definition earlier in the introduction.

6. Line 34 – "various assessments of improving transition outcomes have been developed". The authors cite several measures which is excellent. This might be better in a Table so reader can easily know what measures are being referred to here, and to highlight the gap for mental health settings. Were these the 'standard scales' used to assess validity? Please clarify.

Response: Thank you for your comment. More depth is given about these other measures in manuscripts currently in preparation by other members of the MILESTONE Consortium. To avoid substantial overlap these measures have not been described in depth here. The 'standard scales' have been specified within the text.

7. Line 45-46 – in mental health it seems that certain components might be more useful than others (to assess readiness?). Please cite literature and expand on this

Response: We have expanded the text and cited some of the relevant literature.

8. Mention of the clustered RCT, and the TROM, could be saved for methods or discussion and seems to distract from the focus of this paper on measure development.

Response: Edits have been made to hopefully improve the distinction.

Methods

9. I found the organization of this section difficult to follow. Understandably there are a lot of steps involved in measure development and validation. It might be helpful for authors to separate the methods used for Scale Development from the Validation study to improve the organization. For a great example of what I mean (and relevant to your study!), please see: Tobon JI, Reid GJ, Goffin RD. Continuity of Care in Children's Mental Health: Development of a Measure. Adm Policy Ment Heal Ment Heal Serv Res. 2014;41(5):668-686.

Response: The organisation was based on the US FDA Guidance for Patient-reported Outcome Measures (PROM) and the manuscript follows this process. Nevertheless, we thank the reviewer for their suggestions and have revised this part of the manuscript accordingly.

10. Great that PROM guidelines followed. Please clarify how this was followed or how it guided the phases.

Response: The existing text within the methods section has been rephrased to clarify the PROM stages; the results section is laid out mirroring these.

11.Please clarify literature reviewed and expert panel and focus group themes. If the data from the focus groups is published elsewhere please cite, otherwise more details on qualitative findings would be helpful.

Response: This is a useful comment and is in the progress of being done by the consortium. In addition, there is more information on these processes in a manuscript about the protocol for the development of this measure which is currently in submission.

12. Please clarify characteristics (e.g., age, diagnoses) for adolescents/young adults who participated in validation. as well as demographic characteristics of parents and providers CAMHS and AMHS (e.g., training, professional roles, etc.).

Response: Demographics of the larger sample are presented in Supplementary Information Tables 1 and 2. The tables show the diagnoses, country of recruitment, gender and ethnicity. Other

characteristics such as the demographics of parents and CAMHS and AMHS providers will be described in subsequent manuscripts that are in preparation.

13. Clarify what the ‘standard scales’, or the other measures participants completed, to assess validity. I see these are mentioned in Results but could be described in detail here.

Response: The standard scales have been clarified. To avoid repetition, these measures are described in other manuscripts in preparation by other members of the MILESTONE consortium. However, we thank the reviewer for the suggestions and wording has been added to the current manuscript to make this clearer.

14. Several details of the measure development seem to be missing from this section: methods for formatting and scaling/pilot testing, sampling/recruitment methods for panel/focus groups/validation, a priori hypotheses for validation, etc.

Response: Thank you for your comment. A detailed explanation of the measure development (a TRAM/TROM protocol development manuscript) is currently in submission. To avoid a substantial overlap, development of the scale is not discussed in detail here

15. Definitions of types of validity assessed could possibly help to organize this section (eg construct, convergent, discriminant etc). I think criterion (outcome) validity is being assessed in a separate follow-up paper?

Response: Yes, this is correct. A more detailed description of the outcome (TROM) is currently in the process of being submitted.

16. Analyses section missing? More details needed on reliability calculations/cut-offs, preliminary analyses (initial item analysis), CFA, etc. I see this is weaved later into Results section – might be better to keep all of this together in paper though I’m not sure if there is a perfect solution here.
Response: Thank you for your comment. The authors agree that there is not a reasonable solution here and rearranging it in this context would complicate and detract from the development and validation process of the TRAM. This is because the validation of the TRAM followed different phases and it was fairly complex in its design. In the manuscript, we chose to present it according to the US FDA Guidance for Patient-reported Outcome Measures (PROM) which starts with the literature review and then a review by a panel of experts. This then moves to the focus group stage, which in turn provided the first items to be defined. Afterwards, the two phases of the data collection for the statistical analyses were explained – (i) a small pool of subjects for the test-re-test reliability and the (ii) wider pool for all the rest of the psychometrics as presented in Figure 1.

17. I would suggested conducting analyses to assess the responses on the measure to participants’ demographic characteristics (not presented in this paper) to see if parent/adolescent responses are related to family structure, SES, child characteristics (sex, age etc).

Response: We have updated the manuscript substantially. A section on the deprivation index has been added; this index is explained in the Methods, presented in the Results section and deprivation index correlations versus TRAM Symptom Sub-scales scores are shown in Table 5. This discussion has also been updated (pages 23 and 24).

Results/Discussion 18. More details on the literature review and what types of articles reviewed would be helpful, and how the core structure of TRAM was developed are needed. Is this framework or structure published elsewhere?

Response: As mentioned in the previous points, these details are included in a manuscript describing the protocol used to develop this measure that is currently in submission.

19. Description of other existing instruments used to assess convergent validity needed for those unfamiliar with them. Interesting why no transition-specific measures (eg TRACK) were used?
Response: Thank you for raising this point. In the context of the current manuscript there is no measure that is conceptually like the TRAM and theoretically it could not be compared to other transition measures such as TRACK or the HoNOSCA. The TRACK and HoNOSCA are not transition 'specific' measures per say, but instead were both reviewed in depth during the development phase and relevant themes were included from them. Our study showed that the TRAM is conceptually different to other measures of transition specified in the manuscript and these conceptual differences from the basis of a web-based transition electronic passport. Pilot evidence has deemed that this has being very useful because it provided a visual tool for healthcare professionals working with young people. It was able to emphasize and accurately inform clinicians the areas that need focus when considering readiness and appropriateness for transition (e.g. symptom experience, or elements which may influence the transition). The detailed results of this transition passport is beyond the scope of the current paper and will be described elsewhere.

20. Was discriminant validity assessed using the same instruments for convergent validity? I'm not clear on if this is a standard practice or not.

Response: In our analyses, we used the Cronbach's alpha to test the reliability (internal consistency) of the sub-scales which compose the instrument. The value of the Cronbach's alpha, in other words, could be interpreted as measure of the consistency of the concept behind each sub-scale. If the Cronbach's alpha is above the .600 it is fair, for values between .700 to .800 is good and above it is very good. This means that when the Cronbach is good all the items of a sub-scale are measuring the same variable (for example the risk factors).

We also compared the subscales when it is appropriate with the other 'standard' instruments available in the literature. In this way we tested the convergent validity. We assessed whether sub-scales might theoretically be related to certain standard instruments because they measure similar variables. Our study showed that the TRAM is conceptually different to other measures of transition specified in the manuscript. We mention this in the discussion where we state that although the TRAM had good reliability for all versions it showed moderate to low correlations when compared with other standard instruments. This finding supports the use of TRAM to assess transition readiness, as higher correlations would imply that the TRAM was not adding anything new when compared to existing measures of transition such as the HoNOSCA.

21. It might be helpful to separate results for the adolescent, parent, and clinician versions? Somewhat hard to follow when all grouped together.

Response: Thank you for your comment. The authors feel that this would detract from the readability of the manuscript as it will make it more difficult to understand the sub-scale by subscale results. Moreover, having together the three versions together allows the psychometric differences between versions to be easily compared by the reader.

22. Possible to discuss why removing certain items would improve the Symptoms sub-scale.
Response: We do not only use the Cronbach's alpha values, but we also use inter item correlations (IIC). This value represents how much the items part of a sub-scale are linked one with the others. Typically, the threshold for this value is above .200 (if the IIC is above this - is ok). A poor ICC is usually interpreted as a cue that an item does not "fit" into a sub-scale. As proof of this we also use the "Cronbach's value if an item would be deleted": if this value is greater than the actual alpha, it is another indication that the item should be moved elsewhere.

23. Justification for the EFA on the adolescent version seems reasonable. However I'm not following the statement on Line 26 - The EFA showed that the number of factors were not set for the

‘symptoms’ and ‘factors affecting symptoms’ sub-scales, otherwise the number of factors were set to two (‘overall disruption’, ‘risk factors’ and ‘barriers to functioning’ subscales).

Response: Text (page 18) has been amended.

24. Did the EFA or CFA confirm that items could be mapped onto “readiness” and “appropriateness”? Did the subscales map onto two scales for these? I’m not following how these two goals of the TRAM were assessed in the validation.

Response: This discussion (page 21) has been updated to reflect that the factor analysis showed the items of the TRAM could be mapped onto readiness and appropriateness and formed the basis of a transition passport that will assist in the identification of high-risk cases or those who can be appropriately discharged or transitioned to another community service. The transition passport is not the focus of the current manuscript and full details of it will be described elsewhere.

25. The Discussion focuses largely on the TRAM being “different” enough from other transition measures. However, whether the goal of assessing readiness and appropriateness was met should be discussed.

Response: Relevant text has been added.

26. Strengths and limitations section reads well. The TRAM score summary report with visual graphics sounds interesting. Could this be included in supplementary materials or as a Figure?
Response: We thank you for your comment. The intellectual property (IP) of the TRAM score summary report with visual graphics will be managed by King’s College London and the authors will follow their advice.

## VERSION 2 – REVIEW

| **REVIEWER** | Dr Janet McDonagh<br>University of Manchester |
|---|---|
| **REVIEW RETURNED** | 22-Jan-2020 |

| **GENERAL COMMENTS** | The authors have clearly detailed their revisions.<br>A few comments remain.<br>(i) The response to point 7 is still unclear and should be revised further eg<br>“This is an important point and emphasizes that during transfer, other factors such as life events need to be taken into consideration when developing readiness measures. Health transition is only one of several life transitions during adolescence and young adulthood . Other life transitions at this time include educational and social transitions including moving from parental home to independent living.”<br><br>(ii) Response to (9)<br>As the participants do not include young people in the early stages of adolescent development, it cannot be stated that the measure has not been tested in this age group which is the age group when transitional care has been proposed to start (in national and international guidance documents) nor has it been tested in young adulthood which is primarily the 3rd phase of transition ie after the |
|---|---|

| | transfer boundary and when many of the “transitional” skills actually continue to develop.<br><br>(iii) The authors have now added a section on patient involvement but the 2nd point is actually included details about research participation rather than involvement and the 3rd point is dissemination so only the first point is truly PPI as long as the focus groups were not also research. |
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**VERSION 2 – AUTHOR RESPONSE**

Reviewer(s)' Comments to Author:

Reviewer: 1
Reviewer Name: Gillian Mulvale, Associate Professor Health Policy and Management Institution and Country: McMaster University, Canada. Please state any competing interests or state ‘None declared’: None declared

Please leave your comments for the authors below
Excellent and much needed work. Please see very minor editorial comments on attached file.
Response: We thank the reviewer for their comment and have updated the manuscript with the comments (see below):

Page 6 of 35 (line 9): Missing word in this sentence
Response: Amended.

Page 11 of 35 (line 44): Curious why focus groups did not involve young people with experience of AMHS. Would be helpful to understand why this perspective was not considered...perhaps this is in an earlier publication?
Response: We thank the reviewer for noticing this. Focus groups contained young people with experience of CAMHS and transition to AMHS (if applicable). The text has been amended accordingly.

Page 17 of 35 (line 15): Something awkward in wording in this sentence, need the word 'it' after comma?
Response: Amended

Page 17 of 35 (line 17): Need to insert 'by' before removing
Response: Amended

Page 20 (line 47): Remove of
Response: Amended
Page 22 of 35 (line 10): I think more detail is needed here with respect to the implications for TRAM in use if these high needs group are unlikely to have participated in development of the measure. Will the measure be applicable to these groups? These are groups who particularly struggle during transition. What are the implications of this for practitioners?

Response: We thank the reviewer for their comment. These measures would still be useful for patients with complex psychopathology and we have amended the text accordingly in the discussion section to state this:

“Notwithstanding these concerns, the measure is still likely to be useful in these high-risk groups and would be beneficial for healthcare practitioners. Despite the focus groups not having patients who were very ill, the validation was done in a mixed group of patients with multiple disorders of varying complexity and hence shows that the TRAM can be used in complex psychopathology.”

Page 22 of 35 (line 19). Given that many youth will be transitioning across a number of clinical settings, as well as social and other services because of age-based eligibility, it would be helpful to have a commentary on usefulness of TRAM in these various settings.

Response: We have added some text (underlined below) stating that future work would need to assess the usefulness of TRAM across other age-based services:

This would be important given that young people are likely to have several transitions during their transition journey and although the TRAM did not capture transition from other services i.e., within social care, it could still be used as a foundation to develop similar measures for other services. Future work would need to explore transition readiness in young people during their entire transition journey and the usefulness of TRAM across other age-based services.

Reviewer: 2
Reviewer Name: Janet Mcdonagh Institution and Country: University of Manchester. Please state any competing interests or state ‘None declared’: None declared

Please leave your comments for the authors below. The authors have clearly detailed their revisions.

A few comments remain.
(i) The response to point 7 is still unclear and should be revised further eg
“This is an important point and emphasizes that during transfer, other factors such as life events need to be taken into consideration when developing readiness measures. Health transition is only one of several life transitions during adolescence and young adulthood. Other life transitions at this time include educational and social transitions including moving from parental home to independent living.”
Response: We have now amended this section further to emphasise that alongside health transitions other factors such as educational and social transitions also need to be considered during this time transition period. The amended text is below:

“These raise some important points that need to be considered during transfer when developing readiness measures. Health transitions are only one of several life transitions during adolescence and young adulthood. Other factors also need to be taken into account during this transition period such as those relating to educational and social transitions including moving from parental home to independent living.”

(ii) Response to (9)
As the participants do not include young people in the early stages of adolescent development, it cannot be stated that the measure has not been tested in this age group which is the age group when transitional care has been proposed to start (in national and international guidance documents) nor has it been tested in young adulthood which is primarily the 3rd phase of transition ie after the transfer boundary and when many of the “transitional” skills actually continue to develop.
Response: We thank the reviewer for this comment. Even though the TRAM measure has not been tested when transitional care has been proposed to start, it was designed to capture the current state of transitional care in young people aged 16 to 19 years of age in Europe and not during early stages of adolescent development or young adulthood. Nevertheless, the text has been amended in the limitations section of the manuscript to state that future work would need to explore transition

readiness in young people during their entire transition journey and the usefulness of TRAM across other age-based services.

(iii) The authors have now added a section on patient involvement but the 2nd point is actually included details about research participation rather than involvement and the 3rd point is dissemination so only the first point is truly PPI as long as the focus groups were not also research.
Response: Point 2 and 3 have been deleted and we have added a new point considering the assistance from the Young Project Advisors who helped in understanding how the project could be implemented and how changes could be made to current mental health transition services.