

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)	The Quality of Health Literacy Instruments used in Children and Adolescents: A Systematic Review
AUTHORS	Guo, Shuaijun; Armstrong, Rebecca; Waters, E; Sathish, Thirunavukkarasu; Alif, Sheikh; Browne, Geoff; Yu, Xiaoming

VERSION 1 – REVIEW

REVIEWER	Martha Driessanck OHSU Portland, OR USA
REVIEW RETURNED	01-Nov-2017

GENERAL COMMENTS	<p>This is extremely well written and transparent. I offer two minor suggestions:</p> <p>The first is a caution about how children are described. The author(s) state: "Compared with adults, children and adolescents have limited cognitive ability and are dependent on their parents for health decisions. It is challenging for them to accurately self-assess their ability to find, understand, communicate and apply health information." This line of commentary contributes to the continued misrepresentation of children as being 'in process' or human becomings, rather than human beings. Perhaps it is our issue that we do not take the time to assess them in ways that are congruent with their cognitive strengths.</p> <p>Second, just a heads up that the author(s) at times interchange the terms children and adolescent. Perhaps most apparent is on p. 28 in the conclusion with "After comparing measurement contexts and measurement purpose, the HLAT-8 was identified as the most suitable instrument for measuring ADOLESCENT health literacy in school". There are significant differences in cognition between children and adolescents, most notably - seriation skills - which are required for anyone completing a Likert scale, whether it be 5 or 7 items. Children are able to convey information when 3 choices are offered. This is clearly documented. So it is not that they cannot or are unable to share this information, we set them up by not paying attention to this.</p> <p>Again, these are only small comments of caution.</p>
-------------------------	---

REVIEWER	Debi Bhattacharya School of Pharmacy University of East Anglia
REVIEW RETURNED	22-Jan-2018

GENERAL COMMENTS	<p>Abstract</p> <p>A good precis of the findings, however, the language in the results regarding the main focus being functional domain and characteristics of cognitive development and dependency needs</p>
-------------------------	---

	<p>refinement to make it more accessible. As these terms are not introduced in the 'objective', it means that readers (unless experts in the field) will not be able to interpret these results. Please either explain the terms in the objectives or re-phrase to provide more description in the results. Conclusion introduces new results – HLAT-8. Please report this finding in the results.</p> <p>Introduction provides a comprehensive yet succinct overview of the existing evidence and its gaps.</p> <p>Methods Has the review protocol been registered on any database to maximise transparency in process? Inclusion/exclusion criteria I am unfamiliar with the research are of childhood/adolescent health literacy and therefore am unable to comment on the appropriateness of the age limits applied to the inclusion criteria of 6-24; some justification of this age band is required.</p> <p>Please clarify what is meant by full paper unavailable, does this also include unavailable to the authors e.g. institution does not subscribe to the journal or only cases where there is no full paper. If the former, then this is a substantial limitation that needs to be stated.</p> <p>Methodological quality assessment of included studies I agree with the authors' comment regarding lack of a gold-standard tool for health literacy measurement, however, inability to report on this element significantly limits the utility of the findings – the abstract concludes that the HLAT-8 may be the best available tool but this is with no reference to criterion validity which arguably is the most important element of a tool. I think that the authors do need to choose one or more 'gold standard' tools to be able to provide some comment on criterion validity with the caveat that the gold standard is less than ideal.</p> <p>Having read the full paper, the abstract is misleading – it reports the outcome measures to be validity which leads the reader to infer criterion validity and therefore when the results are interpreted they are done so in the context of criterion validity which has not been assessed.</p>
--	--

VERSION 1 – AUTHOR RESPONSE

Editor		
Section / Page / Line	Comment	Response

Comment 1	Please remove the second part of the title and replace it with the study design.	Thank you for this suggestion. We have changed the original title to this: "The Quality of Health Literacy Instruments used in Children and Adolescents: A Systematic Review". Please see Page 1, Line 5-7.
Comment 2	The search currently only goes up to May 2014 - please update this.	Thank you for this comment and thank you for extending our revision deadline. We have worked hard in the past two months and updated the search timeline from May 2014 to Jan 2018. After screening by two authors, we finally included 14 new papers published in the past four years. It can be seen that health literacy measurement in children and adolescents is quite a hot research interest in recent years. Please see Page 7, Line 44-51.
Comment 3	You make reference to anonymous reviewers in your Acknowledgments section - please note that BMJ Open operates open peer review and so reviewers will not be anonymous. You may want to change this sentence accordingly.	Thank you for this suggestion. We have added reviewers' name: "The authors also appreciate the helpful comments received from the reviewers (Martha Driessnack and Debi Bhattacharya) at BMJ Open." Please see Page 39, Line 42.
Reviewer 1 Reviewer Name: Martha Driessanck Institution and Country: OHSU, Portland, OR, USA		
Section / Page / Line	Comment	Response

<p>Comment 1</p>	<p>The first is a caution about how children are described. The author(s) state: "Compared with adults, children and adolescents have limited cognitive ability and are dependent on their parents for health decisions. It is challenging for them to accurately self-assess their ability to find, understand, communicate and apply health information." This line of commentary contributes to the continued misrepresentation of children as being 'in process' or human becomings, rather than human beings. Perhaps it is our issue that we do not take the time to assess them in ways that are congruent with their cognitive strengths.</p>	<p>Thank you for this comment. Yes, we want to avoid misrepresentation of children as human being 'in process'. We have changed a way to express the original meaning. "Compared with adults, children and adolescents are more dependent on their parents for health-related decisions. Measurement error is more likely to occur when children and adolescents answer self-report items. Therefore, performance-based assessment is often selected to avoid such inaccuracy." Please see Page 36, Line 51-55.</p>
<p>Comment 2</p>	<p>Second, just a heads up that the author(s) at times interchange the terms children and adolescent. Perhaps most apparent is on p. 28 in the conclusion with "After comparing measurement contexts and measurement purpose, the HLAT-8 was identified as the most suitable instrument for measuring ADOLESCENT health literacy in school". There are significant differences in cognition between children and adolescents, most notably - seriation skills - which are required for anyone completing a Likert scale, whether it be 5 or 7 items. Children are able to convey information when 3 choices are offered. This is clearly documented. So it is not that they cannot or are unable to share this information, we set them up by not paying attention to this.</p>	<p>Thank you very much for this suggestion. We have checked the issue of interchanging terms of 'children' and 'adolescents' across the full text. To make it much clearer, we also justified the age range of 'children' and 'adolescents' in the section of 'Eligibility criteria': "This broad age range was used because the age range for 'children' (under the age of 18) and 'adolescents' (aged 10 to 24) overlap and also because children aged over 6 are able to learn and develop their own health literacy" Please see Page 8, Line 27-32.</p> <p>We also agree with the reviewer's comment. Children are able to convey information when 3 choices are offered. This evidence can be also found in one study of our included studies (Ref 46: Schmidt, C. O., Fahland, R. A., Franze, M., et al. 2010. Health-related behaviour, knowledge, attitudes, communication and social status in school children in Eastern Germany. Health education research, 25(4), 542-551.). When discussing the use of the HLAT-8, we added comments about its future use, including its use of target population. "However, there are still two main aspects that need to be</p>

		considered in future. One aspect is its use in the target population. Given the HLAT-8 has not been tested for children and adolescents under 18, its readability and measurement properties need to be evaluated. The other aspect is that its convergent validity (the strength of association between two measures of a similar construct, an essential part of construct validity) has not been examined. Testing convergent validity of the HLAT-8 is important because high convergent validity assists researchers to understand the extent to which two examined measures' constructs are theoretically and practically related." Please see Page 38, Line 30-43.
Reviewer 2		
Reviewer Name: Debi Bhattacharya		
Institution and Country: School of Pharmacy, University of East Anglia		
Section / Page / Line	Comment	Response
Abstract		
General comment	A good precis of the findings, however, the language in the results regarding the main focus being functional domain and characteristics of cognitive development and dependency needs refinement to make it more accessible. As these terms are not introduced in the 'objective', it means that readers (unless experts in the field) will not be able to interpret these results. Please either explain the terms in the objectives or re-phrase to provide more description in the results. Conclusion introduces new results – HLAT-8. Please report this finding in the	Thank you for this comment. We have re-phrased this finding in the results of Abstract: "When measuring health literacy in children and adolescents, researchers mainly focus on the functional domain (basic skills in reading and writing) and consider participant characteristics of developmental change (of cognitive ability), dependency (on parents) and demographic patterns (e.g. racial/ethnic backgrounds), less on differential epidemiology (of health and illness)." Please see Page 2, Line 36-41.

	results.	Thank you for this suggestion. We have added the result of the HLAT-8: “The 8-item Health Literacy Assessment Tool (HLAT-8) showed best evidence on construct validity.” Please see Page 2, Line 47-49.
Introduction		
General comment	Introduction provides a comprehensive yet succinct overview of the existing evidence and its gaps.	Thank you.
Method section		
Comment 1	Has the review protocol been registered on any database to maximise transparency in process?	Thank you for this question. We registered the review protocol in PROSPERO (International prospective register of systematic reviews). The registration number is CRD42018013759. The review protocol is also available in the supplementary file: Appendix 1.
Comment 2	Inclusion/exclusion criteria I am unfamiliar with the research are of childhood/adolescent health literacy and therefore am unable to comment on the appropriateness of the age limits applied to the inclusion criteria of 6-24; some justification of this age band is required.	Thank you for this suggestion. Yes, we have justified the age range by adding this sentence: “This broad age range was used because the age range for ‘children’ (under the age of 18) and ‘adolescents’ (aged 10 to 24) overlap and also because children aged over 6 are able to learn and develop their own health literacy”. Please see Page 8, Line 27-32.
Comment 3	Please clarify what is meant by full paper unavailable, does this also include unavailable to the authors e.g. institution does not subscribe to the journal or only	Thank you for this comment. Yes, this sentence needs to be much clearer. We have changed to “studies were excluded if: (a) the full paper was not available

	cases where there is no full paper. If the former, then this is a substantial limitation that needs to be stated.	(i.e. only a conference abstract or protocol was available)". Please see Page 8, Line 39-41.
Comment 4	<p>Methodological quality assessment of included studies</p> <p>I agree with the authors' comment regarding lack of a gold-standard tool for health literacy measurement, however, inability to report on this element significantly limits the utility of the findings – the abstract concludes that the HLAT-8 may be the best available tool but this is with no reference to criterion validity which arguably is the most important element of a tool. I think that the authors do need to choose one or more 'gold standard' tools to be able to provide some comment on criterion validity with the caveat that the gold standard is less than ideal.</p>	<p>Thank you for this comment. Yes, we agree with the reviewer's comment. Due to lack of gold-standard tool for health literacy measurement, it will limit the utility of the findings. Therefore, we took two actions to address this issue:</p> <ul style="list-style-type: none"> • Action 1: We added comments on the recommendation of future use of the HLAT-8 in the discussion "However, there are still two main aspects that need to be considered in future. One aspect is its use in the target population. Given the HLAT-8 has not been tested for children and adolescents under 18, its readability and measurement properties need to be evaluated. The other aspect is that its convergent validity (the strength of association between two measures of a similar construct, an essential part of construct validity) has not been examined. Testing convergent validity of the HLAT-8 is important because high convergent validity assists researchers to understand the extent to which two examined measures' constructs are theoretically and practically related." Please see Page 38, Line 30-43. • Action 2: We added comments in the limitation section " Third, criterion validity was not examined due to lack of 'gold standard' for health literacy measurement. However, we examined convergent validity under the domain of 'hypotheses testing'. This can ascertain the validity of newly-developed instruments against existing commonly-used instruments." Please see Page 39, Line 3-9.

Comment 5	Having read the full paper, the abstract is misleading – it reports the outcome measures to be validity which leads the reader to infer criterion validity and therefore when the results are interpreted they are done so in the context of criterion validity which has not been assessed.	Thank you for this comment. We have taken the above two actions to make our finding more objective and much clearer. Please see Page 38, Line 30-43 and Page 39, Line 3-9.
-----------	--	--

VERSION 2 – REVIEW

REVIEWER	Debi Bhattacharya University of East Anglia, UK
REVIEW RETURNED	02-Apr-2018

GENERAL COMMENTS	<p>Introduction is much improved - thank you. Tables 3, 4 and 5 - presentation might be enhanced by using bold text to emphasise data indicating highest quality i.e excellent and +++</p> <p>The introduction cites three existing SRs focussing on similar study inclusion criteria. The authors critique the methodological approaches adopted by these studies but do not then describe the present study findings in the context of these study findings. I.e. how does the conclusion that HLAT-8 is the best available instrument compare with the other three studies?</p>
-------------------------	--

REVIEWER	Martha Driessnack OHSU USA
REVIEW RETURNED	19-Apr-2018

GENERAL COMMENTS	I appreciate the authors attention and response to previous recommendations and hope they agree the revised version is stronger.
-------------------------	--

VERSION 2 – AUTHOR RESPONSE

Reviewer 1

Reviewer Name: Martha Driessanck

Institution and Country: OHSU, Portland, OR, USA

Section / Page / Line	Comment	Response
-----------------------	---------	----------

General	I appreciate the authors attention and	Thank you for your valuable
---------	--	-----------------------------

response to previous recommendations and hope they agree the revised version is stronger.	feedback. The revised version is much stronger than previous version.
---	---

Reviewer 2

Reviewer Name: Debi Bhattacharya

Institution and Country: School of Pharmacy, University of East Anglia

Section / Page / Line	Comment	Response
-----------------------	---------	----------

Introduction	Introduction is much improved - thank you.	Thank you for your feedback
Results	Tables 3, 4 and 5 - presentation might be enhanced by using bold text to emphasise data indicating highest quality i.e excellent and +++	Thank you for this comment. The authors have updated Tables 3, 4, 5 by highlighting the highest quality using bold text.
Discussion	The introduction cites three existing SRs focussing on similar study inclusion criteria. The authors critique the methodological approaches adopted by these studies but do not then describe the present study findings in the context of these study findings. i.e. how does the conclusion that HLAT-8 is the best available instrument compare with the other three studies?	Thank you for this comment. Yes, the authors agreed with the reviewer's suggestion. Actually, the point has been made in the discussion and conclusion section. Now we have made it more explicit by describing the present study findings in the context of previous three systematic review findings. Please see Page 32 Line 11-15 and

