PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	A comparison of substance use, subjective wellbeing and interpersonal relationships among young people in foster care and private households: a cross sectional analysis of the School Health Research Network survey in Wales
AUTHORS	Long, Sara Jayne; Evans, Rhiannon; Fletcher, Adam; Hewitt, Gillian; Murphy, Simon; Young, Honor; Moore, Graham

VERSION 1 - REVIEW

REVIEWER	Paul Bywaters Professor of Social Work, Coventry University, UK
REVIEW RETURNED	19-Sep-2016

GENERAL COMMENTS	I found this to be a valuable and clearly described study. I have made a couple of minor comments on the attached text. The reviewer also provided a marked copy with additional comments. Please contact the publisher for full details.

REVIEWER	Doug Simkiss Warwick Medical School, University of Warwick Coventry CV4 7AL United Kingdom
REVIEW RETURNED	17-Oct-2016

GENERAL COMMENTS	This paper reports a cross sectional study of a health, behaviour and lifestyle questionnaire in Wales and compares children in foster care to other children. The cross sectional nature of the data set means its value is rather limited and no causation can be implied. The findings on substance misuse and wellbeing are well recognised. The authors have a hypothesis that the poorer health outcomes for looked after young people (LAYP) are linked to their adverse experiences in earlier life (this is a well recognised association) and that current social relationships may mediate this effect. I personally think they rather overstate this case and understate the impact of insecure or disorganised attachment. Twenty years of work with LAYP has taught me that the impact of attachment difficulties on these children's lifecourse is profound and I think this paper rather overemphasizes the current relationship impact; understandably so as this is the only data available to the authors. The discussion does

briefly mention attachment disorders but I think this is actually the key.

A second important issue for me is the living arrangements variable. LAYP were considered to be in foster care. However there are two issues with this approach. Firstly, a small but significant proportion of LAYP actually live at home under 'placed with parents regulations' (I do not know if the regulation is the same in Wales as in England, but I assume the principle exists). This means there may be LAYP in the comparison group and this needs to be discussed. Secondly, some LAYP live in children's homes or residential schools so would be in the unspecified arrangements and so excluded from the analysis. This also should be discussed.

A small risk of systematic bias is in consent. Foster carers do not have parental responsibility. I think it is unlikely, but there is a small risk that this could lead to a bias with more looked after children being withdrawn from the survey. Do the authors have any information on opt outs?

I am worried that I may have an incomplete understanding of the researchers data, but while I understand that the good current relationships was protective; I did think that all of the associations described could be explained by those LAYP with the most damaged attachment having the greatest substance misuse and poorest relationships.

The researchers do recognise some of the limitations of their data; the SES variable is created on the foster home affluence, not the LAYP's real family, and the impact of adversity over the lifecourse that these data can not address.

They do suggest data linkage; this is common in Scandinavia and Bo Vinnerjung and Anders Hjern have done a lot of good work on this in Sweden that they may want to reference. They also talk about General Practice datasets - there was a paper using GPRD to look at pre-care health risks identified in primary care (Simkiss et al) a few years ago.

Finally, the paper may be improved by including more of what LAYP say they want - Supporting document E5 from the NICE guidance PH28 is a systematic review of what LAYP say about care.

REVIEWER	Lesley Fairley
	University of Leeds, UK
REVIEW RETURNED	11-Nov-2016

GENERAL COMMENTS	Statistical review
	The statistical methods used to conduct the study are appropriate, however further descriptions and clarity is needed and the presentation of the results need to be improved.
	Overall were the schools representative of the whole population and how generalizable are the results? What about children that do not attend school on the day of the survey? Were these children offered the chance to complete the survey another time? How might this bias the responses?
	Page 5: for all outcomes how were the responses "I do not wish to

answer" categorised?

Were there any issues with missing data in the survey responses and how were these dealt with?

Page 6, Research ethnics and consent: Can you clarify who was responsible for the opt-out consent for children in foster care? Was it the foster parent? Is there any response bias in who consented and completed the survey?

Page 7, Methods: "As associations for bullying were linear.." Clarify what associations

What method was used to adjust for the clustering at the school level?

Can you specify the relationship variables included in the second model as I don't think this and table 2 clearly show what was included in this model?

Line 20, "… odds ratio for the foster care would fall…" bad terminology

In table 2 you present relative risk ratios for the ordinal regression models this need to be included in the methods section

Results

Inclusion of a flow chart of the study participants and schools completing different sections of the questionnaire would help improve the clarity of the first paragraph of the results

Page 8, line 21 include the OR and 95%CI for this statement

Page 8, line 43 and page 11, line 39: "…diminished to below significance" bad terminology, revise this text

Table 1: include total numbers in each group at top row

Include the results for all study participants

Table 2: is not that clear

Need to include what adjustments have been made in the footnote

For been bullied include the reference category

Does model 1 compare those in foster care relative to those not in foster care, this needs to be stated somewhere. The abbreviation FC for foster care has been used elsewhere but table has foster parents

Model 2 is confusing – perhaps include as a separate table. For each outcome have you included each variable in the columns? For some variables these have been dichotomised whereas in model 1 the variables had 3 levels. Is it a fully adjusted model where all these variables have been included?

Discussion:

Page 11, line 43, "poorer substance use" what does this mean?

Limitations. I think you need to discuss the representativeness of the study participants to the wider population and any bias in the selection of study participant and the implications this may have on the study findings.

VERSION 1 – AUTHOR RESPONSE

Section	Reviewers' comments	Our response
	Reviewer 1: Paul Bywaters	
General	I have made a couple of minor comments on the attached text.	We thank the reviewer for this positive comment.
Introduction	Lines 53-54.	We note the importance of the comment

	The difference compared to England is 50%. I don't think this should be described as slightly higher.	and have changed the text to reflect this.
	Lines 26-33 I'm not sure it is appropriate to compare the LAYP to the general population in this way. The categories used to describe the primary needs of LAYP are notoriously inaccurate.	We understand that there have historically been quality issues with data on categories of need, but data quality and accuracy have improved in recent years. Nevertheless, we acknowledge the reviewers caution against comparisons with estimates of population prevalence and have removed the reference to the NSPCC report.
	Reviewer 2: Doug Simkiss	
General	This paper reports a cross sectional study of a health, behaviour and lifestyle questionnaire in Wales and compares children in foster care to other children. The cross sectional nature of the data set means its value is rather limited and no causation can be implied. The findings on substance misuse and wellbeing are well recognised.	Causal inference is an issue for all cross sectional studies (we include the study design in the title of the paper). We acknowledge the cross-sectional nature of the study in the 'limitations and future research' section. We also discuss in directions for future research future plans for linking data and creation of longitudinal analyses. We agree that the association with substance use is well known. However, we have added a focus on social relationships, which has enabled us to test new hypotheses.
	I am worried that I may have an incomplete understanding of the researchers data, but while I understand that the good current relationships was protective; I did think that all of the associations described could be explained by those LAYP with the most damaged attachment having the greatest substance misuse and poorest relationships.	We agree with this assertion and indeed it forms much of the basis for the hypotheses we pose. We argue in the introduction that early childhood experiences among young people in foster care are more likely to have involved disorganised and insecure attachments, and in part, as a consequence of this, current relationships are likely to be impacted. At present, we do not have measures of early childhood experiences in order to test this hypothesis directly.
Methods	A small risk of systematic bias is in consent. Foster carers do not have parental responsibility. I think it is unlikely, but there is a small risk that this could lead to a bias with more looked after children being withdrawn from the survey. Do the authors have any information on opt outs?	We describe in the research ethics and consent section that the survey was voluntary, anonymised and employed an opt-out consent procedure for both parents and children. We asked schools to return information on the number of parents who opted out, of which 72 of the 87 schools surveyed complied. 36 parents

		opted out. Child opt-out consent was calculated by collating numbers of children, from each school, who said 'no' to completing the online survey. 1137 children opted out. We have inserted a line in sample characteristics section: "36 parents and 1137 children opted out of the survey. We did not capture information on the demographics of this group."
Discussion	A second important issue for me is the living arrangements variable. LAYP were considered to be in foster care. However there are two issues with this approach. Firstly, a small but significant proportion of LAYP actually live at home under 'placed with parents regulations' (I do not know if the regulation is the same in Wales as in England, but I assume the principle exists). This means there may be LAYP in the comparison group and this needs to be discussed. Secondly, some LAYP live in children's homes or residential schools so would be in the unspecified arrangements and so excluded from the analysis. This also should be discussed. The researchers do recognise some of the limitations of their data; the SES variable is created on the foster home affluence, not the LAYP's real family, and the impact of adversity over the lifecourse that these data can not address. They do suggest data linkage; this is common in Scandinavia and Bo Vinnerjung and Anders Hjern have done a lot of good work on this in Sweden that they may want to reference. They also talk about General Practice datasets - there was a paper using GPRD to look at pre-care health risks identified in primary care (Simkiss et al) a few years ago. Finally, the paper may be improved by including more of what LAYP say they want - Supporting document E5 from the NICE guidance PH28 is a systematic review of what LAYP say about care.	We recognise the limitations of the living arrangements variable in the 'limitations and future research section', and have expanded this further to reflect reviewers' comments. We thank the reviewer for highlighting these papers have been included in the

		discussion.
		We have included the findings of this review in the discussion.
	Reviewer 3: Lesley Fairley	
Methods	The statistical methods used to conduct the study are appropriate, however further descriptions and clarity is needed and the presentation of the results need to be improved. Overall were the schools representative of the whole population and how generalizable are the results? What about children that do not attend school on the day of the survey? Were these children offered the chance to complete the survey another time? How might this bias the responses? Page 5: for all outcomes how were the	We address reviewers specific comments below. In the sample characteristics section we indicate that FSM status, an indicator of school-level deprivation, was similar to the national average. We have since also tested representativeness in terms of school size and KS2, KS3 attainment, finding that the sample is representative across all dimensions. At the pupil level, the demographic make-up of the survey is comparable to earlier, smaller, representative surveys in Wales (eg HBSC 2013), other than an overrepresentation of minority ethnic groups (as indicated in the analysis section, percentages are weighted to adjust for this). No specific advice was given about children who were missing on the day their class took the survey, and this is something that will be incorporated for future survey rounds. It is likely that some schools will have included these children at a later date, but the degree to which this was attempted and achieved will vary across schools. In all school surveys there are risks of non-response from persistent absentees, although these are typically small in number. If there were

responses "I do not wish to answer" categorised? Were there any issues with missing data in the survey responses and how were these dealt with?

any bias, the estimates produced in the current study are likely to be conservative – children with poor attendance have some of the worst outcomes.

Page 6, Research ethnics and consent: Can you clarify who was responsible for the opt-out consent for children in foster care? Was it the foster parent? Is there any response bias in who consented and completed the survey?

"I do not wish to answer" responses, and missing data, were excluded from the analyses. This is reflected in the statistical analyses section. For most key variables, missing data were below 5%. However, as we indicate in the results section, some schools opted out of the drug questions, but there were no differences between schools who did or did not complete these questions.

Page 7, Methods: "As associations for bullying were linear.." Clarify what associations.

Parental opt-out was obtained from the guardians that the child resided with. We asked schools to return information on the number of parents who opted out. We did not capture information on the living arrangements of those who opted out on the child or parental level. However, only 0.1% of children were opted out by a parent, and as such, any biases arising from this are negligible.

What method was used to adjust for the clustering at the school level?

Can you specify the relationship variables included in the second model as I don't think this and table 2 clearly show what was included in this model?

This refers to the fact that while for some variables there was a polarisation (for example, with children from foster care more likely to report a very highly or very low level of life satisfaction), at every level of the bullying variable, there was an increased risk of bullying for young people in foster care reporting bullying

Line 20, "… odds ratio for the foster care would fall…" bad terminology In table 2 you present relative risk ratios for the ordinal regression models this need to be included in the methods section

We adjusted for clustering using the SVY settings in Stata 14

The second model comprises all variables in table 2, including all relationship items. We have inserted a couple of words in the statistical analysis section to emphasize

		this, and added a footnote to this effect to the table. We have inserted… "odds <u>and risk </u>ratios"
Results	Inclusion of a flow chart of the study participants and schools completing different sections of the questionnaire would help improve the clarity of the first paragraph of the results Page 8, line 21 include the OR and 95%CI for this statement Page 8, line 43 and page 11, line 39: "…diminished to below significance" bad terminology, revise this text Table 1: include total numbers in each group at top row. Include the results for all study participants Table 2: is not that clear Need to include what adjustments have been made in the footnote For been bullied include the reference category Does model 1 compare those in foster care relative to those not in foster care, this needs to be stated somewhere. The abbreviation FC for foster care has been used elsewhere but table has foster parents Model 2 is confusing – perhaps include as a separate table. For each outcome have you included each variable in the columns? For some variables these have been dichotomised whereas in model 1 the variables had 3 levels. Is it a fully adjusted	To simplify this section, we have included an additional table reporting the sample characteristics. All OR and 95% CIs are included within the table. It is typical not to repeat figures in the text which are present in the table. We have changed 'diminished' to 'reduced'. We feel that given the already large amount of figures within this table, these additions would make the table unnecessarily crowded. As such we have not added this. We have included what adjustments have been made in the footnote; this is also included in the statistical analysis section ("All models were adjusted for clustering at the school level, and adjusted for age, sex, ethnicity and SES".) The models used to predict exposure to bullying are ordinal as described above, and as such have no reference category. We have changed foster parents to foster care. The models compare those in foster care vs those in other living arrangements. This is stated in the statistical analysis section.

	model where all these variables have been included?	
		For each model, the dependent variables are represented by rows, and the independent variables by the column. This is now clarified in a footnote, and the table itself. It is important that the reader is able to see the figures from models 1 (not adjusted for relationship variables) and model 2 (adjusted for relationship variables) side by side, as this comparison is central to testing our hypotheses. As such, we have chosen to leave these in the same table. This is a fairly standard presentation for results of a regression analysis in this journal. All dependent variables are used in exactly the same way in both sets of models. We believe this refers to bullying and substance use, which have more than two categories. As described in the analysis section however, analyses treating these as dependent variables are ordinal regressions, and as such, have no reference category.
Discussion	Page 11, line 43, "poorer substance use" what does this mean? Limitations. I think you need to discuss the representativeness of the study participants to the wider population and any bias in the selection of study participant and the implications this may have on the study findings.	The sentence is "poorer substance use and subjective wellbeing outcomes…". This refers to poorer substance use outcomes. This comment has been addressed in the limitations section.

VERSION 2 – REVIEW

REVIEWER	Doug Simkiss University of Warwick United Kingdom
REVIEW RETURNED	24-Dec-2016

GENERAL COMMENTS	Thank you for the changes made to the manuscript. I have no further recommendations

REVIEWER	Lesley Fairley University of Leeds, UK

REVIEW RETURNED	02-Dec-2016

GENERAL COMMENTS	The authors have sufficiently addressed the comments in my previous review and the updated manuscript is clearer, however, there are still a few minor points I think need to be addressed
	Table 1 What value is presented for gender? You should present numbers and percentages of males and females (or if only presenting one state which) Need to say what the abbreviation FAS is
	It is not statistically correct to say something is above or below significant (I assume you mean statistical significance). Rather than " reduced below significance" should write "Once associations of relationship variables are accounted for in final models, the association of FC with subjective wellbeing was no longer statistically significant"
	The additional changes to table 3 make it clearer, however I think for the ordinal outcomes you need to be clear these are from ordinal regression and what the OR represents from the table alone. For bullying you have the category "ever" in the column which reads like it is a reference category so would be better to state this is per 1 unit increase in level of bullying response.

VERSION 2 – AUTHOR RESPONSE

We thank you and the reviewers for your helpful comments. We are delighted that the manuscript has been recommended for publication. We have made minor amendments to the revised manuscript in response to the comments provided by reviewer three. We hope that you now find that manuscript acceptable for publication.

VERSION 3 – REVIEW

REVIEWER	Lesley Fairley University of Leeds, UK
REVIEW RETURNED	04-Jan-2017

GENERAL COMMENTS	I am happy that the authors have addressed all my previous comments.