Peer Review Report

Review Report on How working conditions, socioeconomic insecurity and health behaviors mediate the association between working poverty and health in Germany.

Original Article, Int J Public Health

Reviewer: Stefanie Sperlich

EVALUATION

Q 1   Please summarize the main findings of the study.

Indicators of socioeconomic insecurity are most important in explaining the association between working poor and mental as well as physical health

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Q 2   Please highlight the limitations and strengths.

Strengths: Representative sample of employees
Limitations: Underestimating of health impaired employees

Q 3   Please provide your detailed review report to the authors. The editors prefer to receive your review structured in major and minor comments. Please consider in your review the methods (statistical methods valid and correctly applied (e.g. sample size, choice of test), is the study replicable based on the method description?), results, data interpretation and references. If there are any objective errors, or if the conclusions are not supported, you should detail your concerns.

Review Manuscript Number IJPH-1604555 The objective of this study was to analyse how working conditions, socioeconomic insecurity and health behaviours mediate the association between wage income inadequacy and health in Germany using a novel mediation approach. The study is interesting and adds to the existing knowledge on social inequality in health by analysing the contribution of various factors on adverse health-related quality of life among the working poor. The paper is well written and the research question is clear. Before publication, however, a number of issues, especially conceptual ones, still need to be clarified. Conceptual issues (Major comments) 1. In many approaches, a general precondition for the existence of a mediator effect is that there is a significant association between the mediator-variables and the outcome. On page 9 (line 180f) it is stated that the PM captures how much of the effect of working poverty on mental and physical health is due to the effect of working poverty on the intermediate. In my view, the necessary path from the mediators to the outcome is missing here. 2. When the method used in the present study can do without the causal path from the mediator to the outcome, please explain the approach in more detail (maybe a counterfactual approachu). When the conventional approach is used that can't do without a positive association between the mediators and the outcome, please provide these results as an additional file in the appendix. 3. Overall, it is not clear to me what accounts for the mediator effect and might explain the difference in health-related quality of life between the working poor and the non-working poor. It is the difference in the frequency of the presence of the mediators between both groups (effect of composition)u Or is it the difference in the effect that the mediators have on the outcome in both groups (effect of coefficient)u Or is it perhaps bothu In the result section, both of these effects are described: On the one hand, the effect of coefficient in terms of a stronger association between ERI and mental health for the non-working poor (page 11, line 208f). On the other, the effect of composition when stating that differences in mental health would decrease when the working poor would have the same living standard level as the non-working poor (page 11, line 211f). If only the effect of different compositions of the mediators matter, then it makes little sense to use mediators that differ little between the groups or for which the unexposed group has a higher prevalence, as is the case for alcohol use. Please state more clearly, which kind of mediator-effects is considered. 4. It is understandable that the exposure (survey 2015) must precede the mediator and the outcome (both 2016).

However, the rational for using the covariates from the 2014 survey is not quite comprehensible for me. In my understanding covariates are a variables that affect a response variable, but are not of interest in a study. In terms of competing variables to the mediators, they should be located in the same time as the mediators in my point of view. 5. Since the exposure must precede the mediator I did not quite understand why the calculation of IPWs is based on a regression model that predict working poverty of the year 2015 by using the mediators of 2016 as explanatory variables. This regression equation makes little sense to me, not only from the points in time, but also from the content. Why economic worries should for example explained working poor¿ It is the opposite direction that working poor leads to economic worries. Please explain the rational for this regression model in more detail. Minor comments 6. Since wage income inadequacy is measured in terms of working poverty it would be more precise to use this term in the title instead of the parent term. 7. Please explain how the outcome variable health-related quality of life differs from other self-reported health outcomes. By using the term physical and mental health (which is in the literature often used for MCS and PCS), it is easy to forget that what is at stake here is the extent to which a person is limited in everyday life by health impairments. 8. Overall, the health difference between the groups is small (in particular given the scale range from 0-100). It seems reasonable to discuss the magnitude of differences in PCS and MCS between the non-working poor and the working poor in relation to other health-outcomes such as self-rated health. 9. It would be helpful to provide the formula for the estimation of the total effect based on the generalized linear model (for example exemplary for all mediators). 10. Please provide information on how to interpret the values obtained by PCS and MCS. Most important is the fact that these values are standardized to a national norm (GSOEP population in 2004) ranging from 0 to 100 points with a mean of 50 points and a standard deviation of 10 points (Nubling et al., 2007). 11. Please provide information on how to interpret the effect size (beta) in Table 2 and 3. Are these differences with respect to standardized T-values¿ 12. Introduction section: Please give references to the statement of opposite causal pathway between inadequate wage income and health (Page 3, line 37f) 13. Statistical analyses (page 8, line 156): do you mean exposure instead of treatment¿ 14. Page 11, line 224: The corresponding values for women are missing here 15. Page 12, line 242-244: This paragraph is somewhat confusing, as it appears that mental work conditions and ERI capture different issues. 16. Conclusion, page 15, line 305: "Results further indicate a ..." This statement is formulated to strongly since the development over the life course was not subject of the study.

Q 9	Originality
Q 10	Rigor
Q 11	Significance to the field
Q 12	Interest to a general audience
Q 13	Quality of the writing
Q 14	Overall scientific quality of the study

REVISION LEVEL

| Q 15 | Please make a recommendation based on your comments: |

Major revisions.