PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Workplace bullying and subsequent psychotropic medication: a longitudinal cohort study with register linkages
AUTHORS	Lallukka, Tea ; Haukka, Jari; Partonen, Timo; Rahkonen, Ossi; Lahelma, Eero

VERSION 1 - REVIEW

REVIEWER	Stein Knardahl, MD, PhD. Prof, Head of dept. Dept of work psychology and physiology, National Institute of Occupational Health, POBox 8149 Dep, N-0033 Oslo, Norway. No competing interest.
REVIEW RETURNED	16-Jul-2012

THE STUDY	This manuscript reports an association between reporting being subjected to or having observed workplace bullying and subsequent psychotropic medication. The design is prospective and medication is assessed by registry data. There are some issues that need discussion prior to publication: The question about bullying does not seem to give a time frame: response categories were “current workplace, earlier in the same or in another workplace, never, or could not say”. Hence, there is no information of when the reported bullying took place or if it lasted. It seems that a single episode is defined as bullying. Furthermore, the follow-up time was five years after responding to the questionnaire. These methodological issues should be discussed. In order to receive a prescription for psychotropic medication subjects must by necessity have seen a doctor, most probably due to mental distress or some symptom. There may be reverse causal association between mental distress and reporting bullying (Finne LB, et al, Scand J Work Environ Health, 2011). References should be given to prospective studies on bullying and distress, in particular studies of reverse causation. Taken together with the long follow-up period, here is a possibility that third factors produce both the reporting of bullying and the prescription of psychotropic medication. Were all respondents working throughout the follow-up period? Minor issues: What is the explanation for the high number of subjects reporting “did not know if they had been bullied”?

	Page 4: “As a consequence, bullying causes psychological stress, but the ….”. The word ‘stress’ may mean an exposure (physics) and adaptation response (Selye’s theory). The negative (health) effect/outcome is distress (i.e. “bullying causes psychological distress”). In general, it would be helpful if authors specify which references are prospective/longitudinal studies.

REVIEWER	G Brousse MD, PhD CHU Clermont Ferrand, 28 place Henri Dunant BP 69, 63003 Clermont-Ferrand Cedex 01, France Univ Clermont 1, UFR médecine, EA 3845, Clermont-Ferrand, F63001 France
REVIEW RETURNED	24-Jul-2012

GENERAL COMMENTS	T Lallukka et al have provided a prospective cohort study in order to examine longitudinally whether workplace bullying was associated with subsequent psychotropic medication among men and women employees of the city of Helsinki. The research question is clearly defined. The overall study design is appropriate, method is clearly described, the main outcome measure is clear, statistical measures are appropriate, results are well presented and discussed. This article is very interesting and it could be published in BMJ open. Moreover some changes should be made before. **Abstract and Method** The authors have classified medication according to the world Health organization ATC. Codifications in the abstract seem different than codification described in the methods. I’m not sure that codifications are necessary in abstract. The authors should specify and clarify this point. It would be interesting (if possible) to have more information about psychotropics treatments (antidepressants, anxiolytics?)

	Results Why in the results section chapters title refers to sleep problems? (The authors mean psychotropics medications….hypnotics..?) In the penultimate chapter of results (women observing bullying page 12) the authors note that previous psychotropic medications attenuated the association between bullying and psychotropic medication (model 2). However effects of other covariate (Model **2**-5 ???) were negligible. It's not clear: first what is the influence of previous psychotropic medication (model 2) and if there is an influence it seems that it is not really different from other model (1.78 to 1.53 model 1 to 2, vs 1.51 for model 3, 1.52 for model 4….) this point should be clarified. **Discussion is clear** It would be interesting to explore (in another study) the place of other potential covariates in particular addictive behaviours (mainly alcohol, nicotine and cannabis). The absence of data on these variables classically associated with mental health should be discussed

VERSION 1 – AUTHOR RESPONSE

Reviewer: Stein Knardahl, MD, PhD.
Prof, Head of dept.

Dept of work psychology and physiology,
National Institute of Occupational Health, Oslo, Norway.

No competing interest.

This manuscript reports an association between reporting being subjected to or having observed workplace bullying and subsequent psychotropic medication. The design is prospective and medication is assessed by registry data.

There are some issues that need discussion prior to publication:
The question about bullying does not seem to give a time frame: response categories were "current workplace, earlier in the same or in another workplace, never, or could not say". Hence, there is no information of when the reported bullying took place or if it lasted. It seems that a single episode is defined as bullying. Furthermore, the follow-up time was five years after responding to the

questionnaire. These methodological issues should be discussed.

Response: It is true our question did not allow us to examine the duration of bullying or when the bullying had begun. However, current bullying referred to time of the baseline survey, and additionally we were able to examine earlier bullying (in the same or another workplace). It is possible current or earlier bullying referred to shorter or longer bullying, or repeated episodes. The question included the following description: “Workplace bullying means isolation of a member of the organization, underestimation of work performance, threatening, talking behind one’s back or other pressurizing”. This does not imply a single episode but more likely a chronic exposure. However, exact time frame was not available. As bullying is likely to be remembered a long time its effects may be persistent as well. Thus bullying, even a single episode, could cause symptoms after a longer period of time (such as those seen in the increased risk of psychotropic medication even after considering prior medication and covariates).

It is possible that a long follow-up time might dilute our findings. However, register based follow-up begun immediately after the survey and any psychotropic medication purchase over the five year follow-up was included. Most of the purchases occurred before the five year end point of the follow-up and we examined time to the first purchase of psychotropic medication. These methodological issues have been clarified in the revised Discussion, and the above limitations have been acknowledged.

In order to receive a prescription for psychotropic medication subjects must by necessity have seen a doctor, most probably due to mental distress or some symptom. There may be reverse causal association between mental distress and reporting bullying (Finne LB, et al, Scand J Work Environ Health, 2011). References should be given to prospective studies on bullying and distress, in particular studies of reverse causation. Taken together with the long follow-up period, here is a possibility that third factors produce both the reporting of bullying and the prescription of psychotropic medication.

Response: We see it as a special strength of this study that psychotropic medication was not based on self-reports but was prescribed by a doctor. Thus it more likely reflects mental ill-health. However, we do not have data available regarding indications of psychotropic medication. That is one reason why we chose to focus on any psychotropic medication, since e.g. antidepressants can be used for different mental health problems and also other reasons, such as insomnia.
We agree reverse causality might partly explain our findings and that the associations could be bidirectional. We have amended the Discussion regarding these issues and added suggested references to prospective studies on reverse causation (Finne et al 2011, Kivimäki et al. 2003).

As mentioned in our first response, most of the medication purchases occurred before the five year follow-up ended, i.e. the follow-up was only until the date of the first purchase. Thus the follow-up time was not that long for most participants with psychotropic medication and the third factors are thereby less likely to have produced the associations. Additionally, we controlled for many key covariates and conducted sensitivity analyses adjusting for various other potential confounders such as alcohol and smoking, and the results remained. We agree there still might be unmeasured covariates. This is acknowledged in the revised Discussion. Thus over the follow-up for example negative life events, independent of earlier bullying, might result in anxiety, depression, and other mental health problems leading to psychotropic medication need.

Were all respondents working throughout the follow-up period?

Response: Most of the respondents were working throughout the follow-up period, as they were 40 to 60 years at baseline. After 5 to 7 years around 20-30% had exited the labour market.

Minor issues:
What is the explanation for the high number of subjects reporting “did not know if they had been bullied”?

Response: There was one response alternative ’I do not know’. There is no explicit explanation for that but one may assume there is some hiding as bullying likely is a sensitive issue.

Page 4: “As a consequence, bullying causes psychological stress, but the ….”. The word ‘stress’ may mean an exposure (physics) and adaptation response (Selye’s theory). The negative (health) effect/outcome is distress (i.e. “bullying causes psychological distress”).

Response: We have clarified the wording, as suggested.

In general, it would be helpful if authors specify which references are prospective/longitudinal studies.

Response: We have specified in the revised manuscript which studies were prospective.

Reviewer: G Brousse MD, PhD

CHU Clermont Ferrand, Clermont-Ferrand Cedex 01, France Univ Clermont 1, UFR médecine, EA 3845, Clermont-Ferrand, F63001 France

T Lallukka et al have provided a prospective cohort study in order to examine longitudinally whether workplace bullying was associated with subsequent psychotropic medication among men and women employees of the city of Helsinki.

The research question is clearly defined. The overall study design is appropriate, method is clearly described, the main outcome measure is clear, statistical measures are appropriate, results are well presented and discussed.

This article is very interesting and it could be published in BMJ open. Moreover some changes should be made before.

Abstract and Method
The authors have classified medication according to the world Health organization ATC. Codifications in the abstract seem different than codification described in the methods. I’m not sure that codifications are necessary in abstract. The authors should specify and clarify this point. It would be interesting (if possible) to have more information about psychotropics treatments (antidepressants, anxiolytics?)

Response: We have omitted ATC codes from the abstract, as suggested. We initially conducted analyses separately for the different treatments (antidepressants, sedatives, hypnotics, and anxiolytics.) Psychotropic medication was mostly antidepressants, while other groups were small and separate analysis was not preferred. However, as actual indications were unavailable we chose to focus on any psychotropic medication for clarity. Moreover, this outcome was used to broadly reflect mental health problems. The results for antidepressants were very similar, except somewhat stronger as compared to any psychotropic medication. We have now briefly mentioned these results in the revised Results section.

Results
Why in the results section chapters title refers to sleep problems? (The authors mean psychotropics medications….hypnotics..?)

Response: Thank you for noticing this. It was a mistake and the section titles have been corrected in the revised manuscript.

In the penultimate chapter of results (women observing bullying page 12) the authors note that previous psychotropic medications attenuated the association between bullying and psychotropic medication (model 2). However effects of other covariate (Model 2-5 ???) were negligible. It's not clear: first what is the influence of previous psychotropic medication (model 2) and if there is an influence it seems that it is not really different from other model (1.78 to 1.53 model 1 to 2, vs 1.51 for model 3, 1.52 for model 4….) this point should be clarified.

Response: We have clarified reporting of the results, as suggested. As other covariates were added in the model including also previous psychotropic medication, the results showed that these other covariates had negligible effects on the associations. Thus the HR:s remained after these covariates were added in the Model 2 including age and psychotropic medication. However, when comparing the model 2 to the age adjusted model 1, the attenuation in the associations was clearer.

Discussion is clear
It would be interesting to explore (in another study) the place of other potential covariates in particular addictive behaviours (mainly alcohol, nicotine and cannabis). The absence of data on these variables classically associated with mental health should be discussed

Response: We initially adjusted for alcohol, smoking, and a range of other covariates such as job strain, marital status, number of children, and common mental disorders at baseline. However, as these factors did not affect the examined associations, they were omitted from the final tables. We agree it is important to mention the analyses regarding smoking and alcohol as one might have assumed these covariates to affect the examined associations. The revised discussion is amended to describe the results of these initial analyses.

VERSION 2 – REVIEW

REVIEWER	Dr G Brousse MD, PhD CHU Clermont Ferrand EA 7280 UdA Departmentof Psychiatry and Addictology 63000 Clermont Ferrand France
REVIEW RETURNED	08-Oct-2012

- **The reviewer completed the checklist but made no further comments.**