Reviewer's report

Title: Are lifestyle-factors in adolescence valid predictors for adult low back pain? A prospective study of a young population

Version: 1 Date: 21 September 2005

Reviewer: Päivi Leino-Arjas

Reviewer's report:

General

The study addresses the pertinent question of the role of three lifestyle-related factors - smoking, overweight, and alcohol consumption - in the etiology of low back pain (LBP). The material available - the large Danish Twin Register including an 8-year follow-up of youngsters aged 12-22 years at baseline - is next to ideal for the purpose.

It seems that the lifestyle variables are adequately assessed and allow the authors to quantitate exposures. Two categorizations of the LBP outcome variable are used in parallel. The analysis design is in general well-planned.

There are some conceptual and other unclarities, however, and several important points that need to be discussed.

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

The tables should be self-explanatory. Please add clarifying information on the data set, the model, as well as the numbers of subjects and cases by exposure category.

The Results section fails to refer to the tables 2-6.

Discussion on the nature of LBP at large, e.g. its common repetitiveness and fluctuation, is missing. This is needed particularly with regard to the interpretation of the follow-up analyses, where 'incident' low back pain is studied. Obviously true incidence cannot be obtained with a recall period of one year in an 8-year follow-up. Motivation for the use of two outcomes (any LBP and LBP for at least 30 days during the past year) should be given, and the similarities/dissimilarities of the results using the two outcomes discussed.

The Introduction begins with a reference to the work-relatedness of musculoskeletal disorders. This creates the expectation that work exposures would be dealt with as possible influencing factors or confounders of the studied associations. The age-span most probably included a group already at working life at baseline, let alone at follow-up. You should include occupation-related issues in the analyses, if possible, or at least in the Discussion.

All the conclusions do not seem to arise directly from the empirical findings or their discussion. They should be rewritten.

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

The abstract and the Introduction (objective) say that the aim is to study whether the lifestyle factors “influence the association with prevalent low back pain”. This is obscure and needs to be rephrased to e.g. “study the association of … with LBP”. The term "prevalent low back pain" should also be reconsidered.

The description of the material overlaps unnecessarily with that of the outcome and predictor variables. The wording of the questionnaire items could be given. The methods section begins with the subtitle 'validation', without mentioning what has been validated. On the other hand, most of the paragraph seems to deal with reliability aspects. In the description of statistical methods interactions are mentioned, but it is unclear of what type (multiplicative?) and between exactly which variables interaction were sought. On the other hand, the stratified analyses in essence are also those of an interaction. The material and methods section should be restructured.

The report should mention whether body weight was measured or based on self-report.

The outcome variables ('LBP-year', 'LBP-long') should be re-labeled to avoid confusion with aspects of the analytical design. Instead of 'alcohol' as a variable name I would prefer the label 'alcohol consumption'.

It is not clear why the analyses among the monozygotic twins in the case-control design do not include the exposure-response analyses.

Leisure-time physical activity was not studied. As it is conceivable that it is part of a lifestyle pattern, it should be taken up at least in the discussion.

Possible causal pathways via which the studied exposures could lead to LBP should be defined in more detail, with some literature references.

Discussion on the possible origin of LBP among young people should be included.

The text would probably benefit of a check by a language expert.

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Discretionary Revisions (which the author can choose to ignore)

The rationale of the use of the term 'validity' in the title of the work is not obvious and I would rather leave it out. The subtitle is not accurate, as the analyses include both cross-sectional and longitudinal ones. It might also mention the fact that the material is a twin population.

I don't quite understand why "early intervention at the time of first onset is the best prevention" (Introduction, para 1). Surely the time has passed at least for primary prevention at the onset of disease, hasn't it?

Was information on the length of smoking exposure missing in the data? Pack-years would be even a better measure of exposure than the intensity of current smoking. This could be commented on. The present categorization of smoking intensity leads to very imprecise estimates in the highest intensity category, perhaps due to a small number of subjects. Was a trichotomy tried?

Instead of 'dose-response' I would use the term 'exposure-response'.
The study reports on many different types of analyses. The reader wonders whether the dichotomous approach to the lifestyle factors is actually necessary.

I would like to see 'OR' and '95 % CI' in the table proper, with clarification of the shortenings in the table head. The reference category could be printed out also in Table 1.

The Results should preferably be phrased in the past tense throughout.

The discussion is now built around the Bradford Hill criteria of causality in a bit mechanistic manner to my taste. It should be clarified to the reader that any obtained evidence regarding the temporality aspect is somewhat limited considering the recall period of LBP.

The finding that the direction of the associations of alcohol consumption and overweight is reversed in the analyses of monozygotic twins discordant for LBP in 2002 could be discussed.

**What next?:** Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Not suitable for publication unless extensively edited

**Statistical review:** No

**Declaration of competing interests:**

I declare that I have no competing interests.