Reviewer’s report

Title: Changes in Health Risk Behaviors of Elementary School Students in Northern Taiwan over Three Years: Results from the Child and Adolescent Behaviors in Long-Term Evolution Study

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Reviewer: Bernard Maire

Reviewer’s report:

General
The authors examine whether the health risk behaviors changed over 3 years in fourth to sixth-grade students in Northern Taiwan. The longitudinal data were analyzed using a linear growth curve model. The authors show globally that unhealthy and aggressive behaviors increased with time while the trend of substance use behaviors decreased slightly. It is concluded that Grade 5 could be the appropriate time for preventive education targeting aggressive behaviors.

The work is of potential importance for those working in preventing risk behaviors early in life, and has the advantages of a longitudinal study, although it is based on a rather short interval (2 years) and partly related to the local cultural context.

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

Title: it indicates ambiguously ‘changes …over three years…’: as a matter of fact, the study includes three year points (surveys), 2001 (start point), 2002 (intermediary point) and 2003 (end point), but formally it makes only two yearly intervals. And year intervals associated changes are the main subject of interest here. This should be made clearer.

Abstract:
Background: ‘over 3 years’, again;
Conclusion: it is given as a main result of the study that ‘risk behaviors started and aggregated in childhood’, but this result has already been the subject of a preceding paper; this is not totally new here. And the last sentence is too general; it does not fit entirely with the results of this paper.

Background:
Although some references are rather old, this short introduction gives a good historical account of the subject, convincingly describes the interest of longitudinal design and analysis, and presents clearly the main purpose of the paper (except the ambiguous ‘over 3-year period’, again).

Methods:
- Although a 12% drop in the first years of a longitudinal study is not unusual, comments should be made on any potential bias linked to it.

- Study variables: only the 13 risk behavior variables have been taken into account, not the 5 positive behavior variables indicated in the preceding paper; why have they been excluded, as it could have been interesting to know how these positive behaviors change with time by contrast to risk behaviors?

Results:
- The initial sample was composed of about half rural and half urban schoolchildren. But nothing is said about their respective specificity concerning health behaviors neither in the preceding paper nor in this one. Do they cluster the same way? Has this been taken into account in the analysis?

- Table 1: a choice has been made of summing every occurrence of any risk behavior, whether once or twice, many times and almost every day; although it gives a crude synthetic view of risk behavior, it is a little frustrating not to have the various grades presented for every year to apprehend better the degree of change, specifically as the authors are considering a rather short interval of time, with probably many small intensity changes. As this is further taken into account into analysis, it is important to figure it somehow.

Discussion:
- The first result (aggregation of health risk behaviors in Taiwan schoolchildren) is not new, as it was already presented in the preceding paper (although under a slightly different form).

- The results on the time change are more interesting despite the short interval considered. They show globally that unhealthy and aggressive behaviors increased with time while the trend of substance use behaviors decreased slightly. However not all components in each category followed these time patterns.

The question then is: are individual behaviors only markers of a more general conduct or not necessarily (e.g. is staying up late due to more homework necessarily related to suppressing urination or playing video games for prolonged periods)? The aggregation in three groups explains about 40%, which is important, but does not necessarily exclude independent behaviors within groups in many instances. In other words, the classical public health question which arises: is it more efficient to prevent the behaviors which show specific change at some year, and not necessarily the whole category, or is it more efficient to set up interventions that target groups of behaviors with the idea that multiple risk behaviors are the main problem? The number of children involved in each case and the type of intervention may not be the same. Maybe two different strategies would be necessary, not just one. The existence of correlations is not sufficient to base interventions; the sociological background on these questions should be expanded (the reference to Millstein et al. is correct, but would anything more recent be available?).

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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)

- Table 1: it is not clear why ranks are not placed in an increasing order; it should normally be the case at least for Grade 4, the reference column.
- Table 2: it is not clear why the lowest part of the table gives results only for factor 2 (eigen value, cumulative explained variance), or is this a global value summed for the three factors? It should give values for each factor.

Discretionary Revisions (which the author can choose to ignore)

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: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests.