Reviewer's report

Title: No association between age at menarche and substance use among Canadian adolescent girls: Results of a cross-sectional study

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Reviewer: Jennifer Downing

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Title: No association between age at menarche and substance use among Canadian adolescent girls: Results from a cross-sectional study

Major compulsory revisions

1. The study is limited to the behaviour reported in the past 12 months only. Thus any relationship between menarche and substance use initiation cannot be explored via this study nor can any substance using behaviour over one year old. As such this study is ill-placed to compare its findings to those studies examining pubertal association with the onset of risk-taking behaviours or studies quantifying the level at which those experiencing early puberty deviate from others during very early adolescence. Authors ought to acknowledge the limitations of examining the relationship between menarche and substance use using broad definitions of risk behaviour (e.g. smoked/not smoked in past 12 months) in a limited timeframe (past 12 months only).

2. The vast majority of study participants had already undergone menarche and may be currently engaged in some level of experimental adolescent behaviour at this time. Thus potentially concealing the relationship between menarcheal timing and substance use behaviours. Without examining data with more categories of risk behaviour some behaviours will go unnoticed. Alternatively, it is possible that by age 14-15 years early maturers behaviour is reflective of average and late maturers. However, conclusions such as this cannot be drawn without longitudinal data.

3. The conclusion that girls attaining early puberty in Canada might undergo smooth pubertal transition or at least similar to late maturing girls is unfounded as this study has only captured a snapshot of behaviour aged 14-15 years which for some early maturing girls may be a significant time period post-menarche and is thus not comparable to late maturing girls, some who have yet to experience menarche.

4. Further conclusions stating that ‘emotional stress associated with early maturations might not play a role in substance using initiation’ seems out of place in a study that is not examining substance use initiation. Authors ought to associate this comment with current substance use as no data are presented to determine the proportion who have ever initiated use of substances or the age at
which initiation occurred.

5. The age of the sample is highlighted and reasons are given for why it has been used. However, considering the age of the sample authors ought to justify why any findings would be relevant to current adolescents in Canada.

6. Conclusions do not summarise the importance of this study in a public health policy or practice context.

Minor essential revisions

1. The title gives the impression that the study has found evidence which definitively rules out any relationship between menarche and substance use among Canadian girls. I do not believe these claims can be substantiated nor is it the aim of the study. Instead the title ought to reflect the original aims of the article including the age group of the sample under investigation and the study’s focus on current substance using behaviours.

2. The background information fails to provide any details of what the youth substance use issues are in Canada in comparison to other countries and fails to justify why it is important to examine them at age 14-15 years. Several studies, some of which are referenced in this article, state that age of risk-behaviour initiation is prior to 14 years or earlier. Therefore researchers need to explain why ages 14-15 were chosen.

3. Details of current Canadian youth risk-behaviour and Canadian legislation surrounding alcohol and other substances would be helpful for the reader.

4. The authors do not appear familiar with those relevant studies that have utilised multivariate analysis to examine the relationship between pubertal timing and substance use behaviours. Furthermore, some references seem to be outdated thus the article would benefit from additional literature searches.

5. The findings relating to paternal relationship and school-life are interesting and reflect those found in other articles. Furthermore, these variables although answered at age 14-15 may reflect importance experiences which have the potential to influence behaviours throughout adolescence. Authors ought to be aware of literature associated with menarche and paternal relationships.

6. The definitions for substance use behaviours seem inconsistent. Smokers and drug users were categorised to represent those who either did or did not smoke or use drugs. However, instead of doing similar in the alcohol use category those who did not report an experience of drunkenness in the past 12 months are defined as non-heavy drinkers. It appears that this could also include many young people who had not engaged in drinking alcohol at all, is this the case or was the sample limited to those reporting alcohol use?

7. Table titles need to be explicit. Substance use outcomes in tables also ought to be defined more clearly e.g. Current smoker instead of Smoking etc.
Discretionary revisions

1. Background, 2nd paragraph – text should clarify that the increase in acquiring HIV or Hepatitis is through injecting drug use, not just illicit drug use.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests