Reviewer's report

Title: Substance use, risky sexual behaviors, and their associations in a Chinese sample of senior high school students

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Reviewer: Andrew Springer

Reviewer's report:

This study aimed to “…assess the prevalence of sexual and substance use behaviors among a Chinese sample of senior high school students. And more specifically, the associations of socio-demographic factors and substance use with risky sexual behaviors were examined…” Strengths of the paper include the research question itself, as the authors indicate that few studies have been published on adolescent sexual health risk behavior; a large sample of Chinese high school students from Shanghai; a systematic approach for collecting data-including the application of informed consent procedures as per the authors’ description; a generally well-described analytic plan; and a relatively strong introduction and discussion that provide context to the study and the study findings. I appreciate the authors’ efforts to address my previous critiques, and the authors have substantially improved the manuscript. Nonetheless, there are still specific aspects of the paper that merit further attention:

Major Compulsory Revisions:

1.) Writing/grammar: Recognizing the challenges of translation, the paper nonetheless needs review and editing from a professional editor. In its current form, there are many grammatical errors that detract from the science and findings that are presented. The paper would also benefit from greater proof-reading by the authors.

2.) Measures

a. The authors state that the AHRBQ included 20 items, and then provide the breakdown of those items by the different risk behavior domains. While a minor issue, the authors then describe multiple demographic questions that were also included. The authors should qualify on p.8 that there were 20 “risk behavior” items, in addition to demographic items.

b. The authors indicate “the AHRBQ was developed by adding 9 items according to an updated literature review, qualitative interview in pilot study, and reliability assessment.” What was the literature review that informed those 9 items? How did the qualitative interviews in pilot study inform these 9 items- and how were those conducted and with whom? What was the reliability assessment (test-retest?)- and how did that inform the addition of 9 items?

c. It would be helpful to indicate to reader that response scales for these items are presented in Table 2.

d. Internal consistency: It is not clear why the authors ran a Cronbach alpha for
the overall questionnaire, especially given the different response options and the fact that the authors are measuring different behaviors/constructs. A rationale/description is needed to understand why an overall Cronbach alpha was run. Secondly, for the specific domains (e.g., “Exposure to sexual behaviors in lifetime (6 items)”), the response options are different. Thus, then, how was a Cronbach alpha run? This question was raised in an earlier review and has not been adequately addressed.

e. Test-retest reliability: No information is provided on when the test-retest assessment took place. Did this happen in the same day? Over a week period? What was the sample that was used to assess test-retest reliability? While authors provide some of this information in their response, this information is needed for the manuscript.

f. Why is masturbation included in a study of sexual health risk behavior? Masturbation is the safest form of sexual activity. Justification is needed, or this measure should be discarded. In the authors’ response to a previous critique, the authors indicate that they “just wanted to know a little about masturbation…” If so, this behavior should not be labeled as a risk behavior.

g. There is a need for consistent construct labels of the measures examined. For example, on p.9, the authors state: “Multiple partner sexual intercourse”, on p.9 “multiple partners in last three months.” On p.9: “ongoing unprotected sexual intercourse (Defined as “sexual intercourse without condom use”)”; on p. 12 the authors use the term “unprotected sexual intercourse in last three months.”

3.) Analysis

a. What does ‘90 females’ mean in paragraph 4 on p.9? Was this a sample size-or a mistakenly placed number? Similarly, on p. 13: “…which may 170 partly account…” Proof-reading is needed.

b. The authors indicate that all demographic characteristic variables and substance use variables were entered into the models. However, on p.12, we learn that the authors also examined the association of younger age of first sexual intercourse and multiple-partner sexual intercourse. A more detailed description of the analyses conducted is needed in the analysis section.

c. A description of how the variables were created is needed, given that it appears that new categories were constructed for several of the behaviors (e.g., substance use behaviors) from the response options.

4.) Results:

a. P.12: The authors state “…after controlling for sociodemographic factors and substance use behaviors, two factors in the final model were significantly associated with increased likelihood of unprotected sexual intercourse…” Often/usually cigarette smoke… and ever had illicit drug use…” Authors should clarify: “after controlling for other substance use behaviors…” as the authors are assessing here substance use behaviors not as covariates, but as independent variables.

5.) Consent/Ethical Oversight of Study: In a previous version of this paper, the authors indicate that approval was obtained from the Ministry of Education of the
People’s Republic Of China; in the current version, the Ministry of Education is not cited, but rather the school board. Is the school board the Ministry of Education?

**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:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests