PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Purpose in life and tobacco use among community-dwelling mothers of early adolescents
AUTHORS	Morimoto, Yuko; Yamasaki, Syudo; Ando, Shuntaro; Koike, Shinsuke; Fujikawa, Shinya; Kanata, Sho; Endo, Kaori; Nakanishi, Miharu; HATCH, STEPHANI; Richards, M; Kasai, Kiyoto; Hiraiwa-Hasegawa, Mariko; Nishida, Atsushi

VERSION 1 – REVIEW

REVIEWER	Carol Ryff University of Wisconsin-Madison
REVIEW RETURNED	30-Nov-2017

GENERAL COMMENTS	Using a large community-based survey from Tokyo, Japan, associations between purpose in life (PIL), an aspect of psychological well-being, and tobacco use were examined among mothers of adolescent children. Drawing on prior studies that have documented prospective health benefits (reduced morbidity, increased longevity, better health behaviors) of higher PIL, the guiding hypothesis was that midlife mothers with higher PIL would be less likely to smoke. After adjusting for numerous confounding factors (age, psychological distress, socioeconomic status, frequency of alcohol consumption) known to predict PIL, smoking, or both, results documented and inverse association of PIL with tobacco consumption. The results are important because the prevalence of smoking is rising among women worldwide, combined with the fact that women have been found to have more difficulty than men maintaining long-term smoking cessation. Thus, identifying psychological factors that may prevent the initiation of tobacco use and/or promote successful cessation of smoking are critically needed advances in contemporary health research. A few refinements would sharpen the presentation of the study. Additional literature could be usefully included in the opening literature review, such as a recent review of over 30 studies linking purpose in life to health aging (Irving, Davis & Collier, 2017, Int J of Aging & Hum Devpt). Also the sample from the Tokyo Early Adolescence Survey (T-EAS) is well-described, it would helpful to have an explanation for the relatively low response rate (43.8%). It would also be useful to provide further description of the findings presented in Table 1, such as that light and moderate smokers differed from nonsmokers on multiple factors (age, educational status, marital status, income). These underscore the importance of incorporating such variables as covariates in the focal analysis. That PIL remained a significant negative predictor of moderate to heavy smoking, after adjusting for these other factors known to be linked with smoking (as well as PIL), is notable.

	The discussion offers plausible interpretations for the obtained effects – namely that those mothers higher in PIL may be more likely to invest in healthy behaviors because they feel their lives are meaningful and have a stronger will to live. Limitations of the study are clearly delineated. More could be said, however, about the possible translational significance of the findings, given growing evidence that aspects of psychological well-being, including PIL, are modifiable (see Sutipan et al. J Happiness Studies; Friedman et al. 2017, Aging & Mental Health; Weiss, Westerhof, & Bohlmeijer, 2016, PLOS ONE). Overall the findings constitute valuable contributions to the literature on factors that may matter in reducing the prevalence of smoking among women, which is an increasing health problem.

REVIEWER	Victor J. Strecher School of Public Health University of Michigan United States
REVIEW RETURNED	09-Feb-2018

GENERAL COMMENTS	Very good study and contribution to knowledge in this area. Weakness (also stated by authors) is the cross-sectional design. That said, controlling for psychological distress in addition to other more typical covariates is a positive aspect of this study. Minor suggestions: - Include correlation matrix of all constructs. - Define none, light, and moderate heavy smoking (line 191) by number of cigarettes smoked. - The term "main carers" is awkward. Suggest "primary caregivers" or something similar. - Would be a strong addition to add a paragraph regarding the cross-cultural significance of purpose in life (Ikigai?).

VERSION 1 – AUTHOR RESPONSE

Please find our responses to comments from the reviewers below. For ease of reading, reviewer comments are indicated in *italics*. Our responses are indicated in **bold.** Changes to the text are indicated by <u>underline</u>.

Reviewers' Comments to Author

Reviewer: #1

Using a large community-based survey from Tokyo, Japan, associations between purpose in life (PIL), an aspect of psychological well-being, and tobacco use were examined among mothers of adolescent children. Drawing on prior studies that have documented prospective health benefits (reduced morbidity, increased longevity, better health behaviors) of higher PIL, the guiding hypothesis was that midlife mothers with higher PIL would be less likely to smoke. After adjusting for numerous confounding factors (age, psychological distress, socioeconomic status, frequency of alcohol consumption) known to predict PIL, smoking, or both, results documented and inverse association of PIL with tobacco consumption. The results are important because the prevalence of smoking is rising among women worldwide, combined with the fact that women have been found to have more difficulty than men maintaining long-term smoking cessation. Thus, identifying psychological factors that may

prevent the initiation of tobacco use and/or promote successful cessation of smoking are critically needed advances in contemporary health research.

RESPONSE: Thank you very much for your encouraging comments.

#1-1) A few refinements would sharpen the presentation of the study. Additional literature could be usefully included in the opening literature review, such as a recent review of over 30 studies linking purpose in life to health aging (Irving, Davis & Collier, 2017, Int J of Aging & Hum Devpt).

RESPONSE: Thank you for your helpful recommendation. We added the literature which you mentioned as below in the Introduction.

Page 7, line 99-100

Recent systematic review showed that greater PIL is related to a range of better health outcomes for older adults.[27]

#1-2) Also the sample from the Tokyo Early Adolescence Survey (T-EAS) is well-described, it would helpful to have an explanation for the relatively low response rate (43.8%).

RESPONSE: We also added an explanation for the relatively low response rate in the Discussion section. We consider that the response rate may be due to some difficult situations for general population survey in Tokyo area, which is an urbanized city in a developed country. A recent study indicated that response rates of Japanese nationwide cross-sectional surveys have declined in the recent decades (from around 70% to 50%: Rindfuss et al Demograph Res, 2015). We described a reason why we only could achieve it in the Discussion section as below.

Page 18-19, line 321-328

The relatively low response rate (43.8%) was also a limitation of the study. A recent study indicated that response rates of national cross-sectional surveys in Japan have declined in the recent decade (from around 70% to 50%).[64] One reason would be that many apartment buildings in Tokyo have recently adopted an automated system that enables residents talk with visitors at the locked gate through video. It allows potential respondents to make a decision of refusing participation without having a face-to-face encounter with the field worker.[64] In future study, we should consider how to overcome this obstacle to achieve higher response rate in general population survey in Tokyo.

#1-3) It would also be useful to provide further description of the findings presented in Table 1, such as that light and moderate smokers differed from nonsmokers on multiple factors (age, educational

status, marital status, income). These underscore the importance of incorporating such variables as covariates in the focal analysis.

RESPONSE: We added further description of the findings in the Results section. We additionally conducted residual analyses to examine the differences between light, moderate to heavy and nonsmokers on these demographic variables.

Page 12, line 196

Cross tabulation, chi-square tests <u>and residual analyses</u> were conducted to test the differences between three groups based on the amounts of tobacco used (none, light, and moderate to heavy smokers), and covariates in categorical variables as well as ANOVAs were used in continuous variables.

Page 13-14, line 225-238

<u>Residual analyses indicated that lower educational attainment (light smokers with junior high school or lower education [adjusted residuals = 6.9, p <.01] and those with high school education [adjusted residuals = 6.9, p <.01]; moderate or heavy smokers with junior high school or lower education [adjusted residuals = 7.0, p <.01] and those with high school education [adjusted residuals = 7.6, p <.01]), not being married (light smokers without being married [adjusted residuals = 4.8, p <.01]; moderate to heavy smokers without being married [adjusted residuals = 8.3, p <.01]), lower family income (light smokers with the lowest family income (less than 4 million yen) [adjusted residuals = 6.1, p <.01] and those with the second lowest family income (4 to 6 million yen) [adjusted residuals = 2.6, p <.01]; moderate to heavy smokers with the lowest family income [adjusted residuals = 6.7, p <.01] and those with the second lowest family income [adjusted residuals = 4.7, p <.01]), and the most frequent alcohol use (light smokers with the most frequent alcohol consumption (more than 4 times a week) [adjusted residuals = 6.6, p <.01]; moderate to heavy smokers with the most frequent alcohol use [adjusted residuals = 2.7, p <.01]) were associated with increasing tobacco use.</u>

That PIL remained a significant negative predictor of moderate to heavy smoking, after adjusting for these other factors known to be linked with smoking (as well as PIL), is notable. The discussion offers plausible interpretations for the obtained effects – namely that those mothers higher in PIL may be more likely to invest in healthy behaviors because they feel their lives are meaningful and have a stronger will to live. Limitations of the study are clearly delineated.

#1-4) More could be said, however, about the possible translational significance of the findings, given growing evidence that aspects of psychological well-being, including PIL, are modifiable (see Sutipan et al. J Happiness Studies; Friedman et al. 2017, Aging & Mental Health; Weiss, Westerhof, & Bohlmeijer, 2016, PLOS ONE).

RESPONSE: We added the literatures as below in the Discussion section.

Page 17-18, line 306-311

A systematic review indicated positive psychological intervention (PPI) had an impact on improving psychological well-being,[61] as well as a meta-analysis showed behavioural intervention had a moderate effect on improving psychological well-being including PIL.[62] A new community-based group intervention to promote psychological well-being has been developed and had a positive effect of improving PIL.[63]

Overall the findings constitute valuable contributions to the literature on factors that may matter in reducing the prevalence of smoking among women, which is an increasing health problem.

RESPONSE: Thank you for your many kind comments.

<u>**Reviewer: #2**</u>
Very good study and contribution to knowledge in this area. Weakness (also stated by authors) is the cross-sectional design. That said, controlling for psychological distress in addition to other more typical covariates is a positive aspect of this study.

RESPONSE: Thank you very much for your encouraging comments.

Minor suggestions:

#2-1) Include correlation matrix of all constructs.

RESPONSE: We additionally conducted a correlation analysis and added a correlation matrix of all variables as shown in Table 2. Description of the correlation was also added in the Results section as below.

Page 12, line 199

Correlation coefficients among all variables also examined.

Page 14, line 239-247

PIL was positively correlated with age, educational attainment, family annual income while negatively correlated with tobacco consumption and psychological distress (Table 2). Tobacco consumption was positively correlated with alcohol consumption and psychological distress while negatively correlated with age, educational attainment, marital status and family annual income (Table 2). Age, educational attainment and family annual income were positively correlated among each other. Marital status was positively correlated with educational attainment and family annual

5

income. Psychological distress was positively correlated with age while negatively correlated with marital status and family annual income (Table 2).

#2-2) Define none, light, and moderate heavy smoking (line 191) by number of cigarettes smoked.

RESPONSE: We have defined the amount of smoking by a pack of cigarettes (=20 cigarettes in a pack). We described half a pack is 10 cigarettes in the Methods section as below.

Page 10, line 162

Respondents were then split into: '0: non-smokers', '1: light smokers (less than half a pack [= 10 cigarettes] per day)', and '2: moderate to heavy smokers (more than or equal to half a pack per day)', to assess potential dose-response effects.

#2-3) The term "main carers" is awkward. Suggest "primary caregivers" or something similar.

RESPONSE: We agreed with your suggestion. We replaced "main carers" to "primary caregivers" in the Methods section as below.

Page 8-9, line 131, 136, 138, 140

This study used data from the Tokyo Early Adolescence Survey (T-EAS),[45] [46] which was originally designed as a baseline survey for the Tokyo Teen Cohort, a currently ongoing longitudinal cohort study (URL: http://ttcp.umin.jp/index.html). The T-EAS is a multidisciplinary survey of 10-year-old adolescents and their primary caregiver (98.5% mothers). The T-EAS contains questions about tobacco use, PIL, and psychological distress, as well as a variety of other potentially confounding variables. Participants were randomly recruited from the resident registries of three municipalities in Tokyo: Setagaya Ward, Mitaka City, and Chofu City. Participants were sent invitation letters on or around the child's tenth birthday. The survey was completed in two home visits. During the first visit, written informed consent from the primary caregiver (generally the mother) was obtained; participants were then asked to complete the questionnaires at home before the second visit. During the second visit, both the adolescent and the primary caregiver were each asked to complete the self-report questionnaires separately. The questionnaires were enclosed in envelopes by the respondents immediately after completion. In addition, the primary caregiver responded to a semi-structured interview. All data were collected anonymously. The T-EAS was conducted by three research institutes: Tokyo Metropolitan Institute of Medical Science, The University of Tokyo, and SOKENDAI (The Graduate University for Advanced Studies). This survey was approved by the ethics committees of these three institutes..

#2-4) Would be a strong addition to add a paragraph regarding the cross-cultural significance of purpose in life (Ikigai?).

RESPONSE: Thank you for your good suggestion. We added the sentence which the cross-cultural significance of purpose in life on better health was mentioned in the Introduction as below.

Page 7, line 99-102

Recent systematic review showed that greater PIL is related to a range of better health outcomes for older adults.[27] The significance of PIL on better health is recently recognized cross-culturally (e.g. Ikigai in Japanese). Recent evidence demonstrated that PIL was associated with healthy glucoregulation among Japanese adults,[28] which had also demonstrated in Western countries.[29]