Author’s response to reviews

**Title:** A population-based survey on physical inactivity and leisure time physical activity among adults in Chiang Mai, Thailand, 2014

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Author’s response to reviews:

Response to Reviewers

Editor-in-chief

Session
Page/Line
Suggestions
Revisions

Language
Review the English
Corrected the grammatical errors and rephrased some excessive sentences

Language
Review the text for minor errors (see e.g. first sentence abstract: nationas. => nations)
Corrected the errors

Methods
P8 L16-18
How was the study design accounted for in the analysis. This is not mentioned in the text (although the statistical software used (STATA) has specific survey features)

Yes, we accounted for the clustering of the data by using the “survey (svy)” command in STATA.

Methods

(As reviewer 2 mentioned)

Methods

Results:

specific factors (e.g. social position or overweight/obesity) affecting the LTPA are not considered I would propose at least an additional related to the different transition stages.

The authors should do a multinomial analysis with outcome the 4 categories of transition (no transition, precomtemplation, contemplation, preparation) so that one can see how being in one of the stages is affected by these determinants.

Thank you for your suggestion. We conducted a multinomial logistic regression as suggested and we used highest education as one measure of social position and adjusted for age and sex.

While our results did not achieved statistical significance, we demonstrated a pattern that higher education could be inversely associated with being in pre-contemplation stage and could be positively associated with being in contemplation and preparation stage.

As multinomial regression is difficult to express as a table, we have demonstrated the results as figure 4

Discussion

The outcome of this analysis is essential to make the discussion more relevant and provide suggestion for health promotion actions.

Reorganised the discussion –and provided suggestions for health promotion actions based on the results.
Reviewer 1

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Suggestions
Response

This is a well-written paper of interest to those who planning to address physical inactivity. Understanding the epidemiology and characteristics of physical inactivity and the the contribution of LTPA to overall PA level and the influence of stages of change is an important approach to designing programs to increase physical activity.

Thank you for your interest in our paper

Reviewer2

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Revisions

Overall comments

The manuscript provides number of important findings. It is important to describe the associations between PA and stages of change. The manuscript is well written and easy to follow. Thank you for your interest in our paper

Overall comments

However, the main weakness, in addition to cross-sectional design, is that no differences in PA or stages of change between normal weight and overweight/obese and between person from different socioeconomic backgrounds. It has been found in previous studies that PA levels are low among those at the lowest socioeconomic position. It also plausible that the stages of change differ between socioeconomic status. Same concern remain regarding the weight status.

Thank you for your comments and suggestions. We have address your specific comments below.

Abstract

P2 L11-14 inform the reader how they defined sufficient levels of physical activity already in the Methods section of the abstract Added the information
“The sufficient levels of physical activity (PA) were defined as ≥150 minutes/week of moderate-intensity PA or ≥75 minutes/week of vigorous-intensity PA or ≥600 metabolic equivalent of task (MET)-minutes/week.”

Abstract

P2 L 17

Please also report the age range and number of men and women in the sample

Added the information

“A total of 1,744 people (808 men and 936 women), aged 15 to 64 years, participated in the study.”

Abstract

P2 L18 revising as "We estimated that a quarter…” to keep past tense

Edited the sentence as the suggestion

“We estimated that a quarter…”

Introduction

P4 L2-4

Please explain what you mean by physically inactive. Is it less than 180 minutes of PA/week in moderate intensity? It is also important to separate sedentary behavior from physical inactivity.

Added the definition of physical inactivity

“Physical inactivity or insufficient physical activity (PA) is defined as less than 150 minutes/week of moderate-intensity PA accumulated across work, home, transport and leisure time activities.”

Introduction P4 L14-17

Provide some data about for example of the prevalence of overweight and obesity in Thailand. This data would provide better understanding how important is to increase energy expenditure.

Added more detail regarding physical inactivity consequences and overweight/obesity prevalence in Thailand

“About one-fifth (17.1%) of Thai adults were overweight while prevalence of class I obesity and class II obesity were 26.0% and 9.0%, respectively.”
Introduction  Please provide some evidence and information about intention to change. Is it related to increased PA in subsequent years in other populations or in some specific populations? Add a sentence with some new references

“...In addition, previous studies shows that stages of change to PA are associated with PA behaviours among various populations [14, 15].

Methods

Please provide a reference for MET-thresholds for moderate and vigorous PA. In adult-populations, 3 and 6 METs are more commonly used. Therefore, the use of these thresholds need to be justified. Thank you. We used the threshold suggested by the Global Physical Activity Questionnaire (GPAQ). The analysis guide suggests that we use 4 METs for moderate-intensity PA and 8 MET for vigorous-intensity PA)

A reference to the questionnaire and guideline for analysis is added in the text

Methods

Whole term is Metabolic equivalent of task. Thank you. We have corrected the term

Methods

Methods

Methods

Analysis

Results

Table 2 and

GPAQ also include one question about daily sitting time as a measure of sedentary behavior. Although not the main aim of the study, I suggest that the Authors also include this information to this manuscript. It would, for example, to see if there are any differences in sitting time between inactive active participants or what is the population mean of sitting and how it differs across age groups. Thank you for your suggestion. We have added a variable (sedentary time) and mentioned it in the statistical analysis and results

“The sedentary time was collected in minutes per day.”
The difference of sedentary time between physically active and inactive populations was analysed using independent t-test. The statistical significance was considered when p<0.05.”

Added the result about sedentary time as Table 2. The results were not statistically significant. There was insufficient evidence to support any differences in sedentary time between active and inactive population.

Methods

Please provide data on reliability and validity of GPAQ. Can this measure classify accurately inactive and active persons? Because this is the main study question, the validity of the questionnaire regarding this issue should be explained and throughout discussed. Thank you for your suggestions. We have added information on the reliability and validity of GPAQ.

“A study, investigated the reliability and validity of the GPAQ from nine countries, showed the moderate to substantial strength of its reliability (0.67 to 0.73); moderate to strong concurrent validity compared with the International Physical Activity Questionnaire (IPAQ) (0.45 to 0.65); and poor to fair criterion validity (0.06 to 0.35).”

Methods

In addition to age and gender, overweight and obesity plausibly affect on PA and stage of change. Please include a measure of adiposity as a modifying factor in these analyses.

We did not collect the weight status of the participants. We discussed about this in our limitations.

Methods

Please also describe the software used to analyze the data.

“All the analyses were performed by using STATA version 13 (StataCorp, Texas, USA).”

ResultsMethods

Results:
In overall, the results are clear and easy to follow and they provide an overview on the prevalence of physical inactivity in the population. The Authors also describe the stages of change, which is important issue, but they did not provide data if there were any differences in stages of change between inactive and active population. For physically active population, we assumed that physically active population were in action or maintenance stages for meeting the recommended levels. In contrast, inactive population were in pre-contemplation, contemplation or preparation.

As suggested by the editor, we have conducted an additional analysis on how education may affect the stage of change among inactive population. Please see our response and changes made to the editor’s comments.

Discussion

Is there any population specific reasons for lower levels of physical activity among females in Thailand. Although it seems to be quite universal phenomenon, some cultural factors may also explain lower PA levels in females.

We added in the discussed about the probable factor related to physical inactivity among Thai women from a mixed –method study.

“It is possible that Thai women had more personal barriers, especially for outdoor activities, compared with men. A significant barrier to women’s outdoor PA was the sun light exposure due to cultural belief of the importance of fair skin [24].”

Discussion

Is there any evidence that environment designed to promote physical activity enhances physical activity levels and is related to stages of change. E.g. if there is adequate routes for cyclist and other light traffic commuters, is it related to higher levels of physical activity. What about parks and other green areas? We have reorganised the discussion and added evidence on the relationships between built and natural environments and PA.

Furthermore, evidence showed that in Belgium, a multi-strategy community-based intervention including local media campaign, environmental approaches, the sale and loan of pedometers, and several local PA projects was effective to increase PA levels [36]. Built environments are also a key aspect to increase PA in a large-scale population. More and better-quality of sidewalks and bicycle lanes are associated with higher rates of walking, biking and meeting PA
recommendations [37]. Active transport or non-motorised transport is associated with increases of PA and positive health outcomes [38]. Moreover, natural environments such as parks, woodlands and beaches are keys locations for PA [39]. Accordingly, there are many effective approaches to increase PA during work, travel and leisure time, however, targeting LTPA may be useful in the promotion of PA among the population as there may be fewer un-modifiable barriers than PA at work and during transport.”

Discussion

P 13

L7-18  Is that a good reference to point out that active commuting may not be the answer. I think we need to look at larger picture and not just one cross-sectional study (which also discussed reverse causation). There are many reviews showing that active commuting is related to decreased cardiometabolic risk (e.g. Hamer & Chida Prev Med. 2008 Jan;46(1):9-13; Shephard RJ Sports Med. 2008;38(9):751-8). And it is probable, if active commuting increases physical activity levels, it is related to improved health at a population level. I suggest that the Authors review the literature more throughout to explore what kind of promotion actions have been effective to improving physical activity levels and is there evidence that LTPA should be the main target. Thank you. We have removed the questioned reference from the manuscript. The discussion has been re-written as stated in the previous comment.

Discussion

P 14

L6-13  "This suggests that sufficient walking is comparable to moderate-intensity PA". This is a little bit odd sentence because I think we agree that walking IS light to MVPA not just comparable to? This paragraph also needs further discussion how to increase PA at population level. I think that there is evidence that affecting on environment and providing psychosocial support is related to increase PA. Thank you. Similar to our response to the previous two comments, we have added to the discussion.

In addition to the changes already mentioned above, we also state in the discussion

“According to our findings, the contribution of LTPA to overall PA among physically inactive population remained consistently low across all age groups, and approximately 400 MET-minutes/week of PA or at least 100 minutes/week of moderate-intensity LTPA or at least 50 minutes/week of vigorous-intensity LTPA should be promoted to the physically inactive population in Chiang Mai. We recommend that any PA promotion programmes need multistrategy approaches including supportive environments, media campaigns and psychosocial supports population in the pre-contemplation stage, along with increasing education and awareness of the importance of PA through media campaigns.”
Discussion

P14 L2-3

Limitations. The limitations also include lack of data on socioeconomic status and overweight and obesity. This should be mentioned although health factors are needed. We have done an additional analysis on education and stage of change but do not have data on overweight and obesity. We agree with the reviewer that this is one of the limitations of our research and these data would be useful.

We state

“Lastly, detailed socioeconomic status and the health related data, for instance, body weight; body mass index; and blood pressure was not collected thus we were not able to correlate PA levels with health outcomes.”