Author’s response to reviews

Title: Use of a public park for physical activity in the Caribbean. Evidence from a mixed methods study in Jamaica

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Version: 1 Date: 07 Apr 2019

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Response to reviewer’s comments from previous manuscript submission

ID number (PUBH-D-18-02510)

We appreciate the reviewer’s thoughtful comments to our research article. We have incorporated and addressed all concerns in the revised manuscript, and as described below.

Technical Comments:

>> Please include the email addresses of all authors on the title page. Please ensure that it is identical to the one entered on the submission system.

Response: Thanks for pointing out this oversight. Corrections have been made on the title page.
The three reviewers have come up with a number of points that should be considered by the authors. In particular:

1. Please address the concern of Rev 2 about the quality of the figures. Consider omitting figure 2, which does not seem to add any further information that is already contained in tables

Response: We agree with the concerns made by the reviewer about the quality of the figures. We have replaced Figure 1 with a satellite image of Emancipation Park, removed and replaced Figure 2, and added new photographs Figures 2, 3 and 4 which represent images of select physical locations within the park. We also ensured that the quality of these figures met the standards recommended in the submission guidelines of BMC Public Health.

2. Integration of the data from the different sources (rev 2). The authors could consider making reference to mixed methods as a paradigm for the research

Response: We agree with this suggestion. We have included additional detail in the Background section, paragraph 4, sentence 2, page 5 lines 9-12.

4. Consider further analysis of this potential rich dataset (rev 2). It would be useful to know more about the different zones of the park.

Response: We have noted the concerns of the reviewer and have added additional analysis where possible. For example, we have followed the suggestion of the reviewer by re-analysing the data according to categories of target area types based on the hypothesis that certain areas promote higher levels of physical activity than others. These changes are now presented in the Results section under a) subsection ‘Sex-Specific Park Use’ paragraph 4 and Table 2 page 15 lines 5-10, as well as b) in subsection ‘Energy Expenditure’ page 15 lines 17-19 and page 16 in Table 3 and described from lines 6-11. Regrettably, based on the design of the SOPARC methodology, we were unable to conduct some of the additional analyses suggested by Reviewer 2 as individual-level data were not collected.
5. more about the context of the park (rev 2) and emphasis on the positives of studying this unique park setting (rev 3)

Response: We agree with these comments and have included additional details in the Background section, page 5, lines 9-12 as well as in the Methods section, subsection ‘Study setting’ page 6, lines 13-26.

Ching Li (Reviewer 1):

1. Define the contributions: The main purpose of this study is to discuss how the public parks contributed to physical activity. However, the definitions of the contribution of the public parks on physical activities were not well-defined. The contributions in this study should be indicated the participating rate, the equality, the diversity, or the accessibility of the PA.

Response: We thank the reviewer for this comment. We have changed the title of the study to “Use of a public park for physical activity in the Caribbean. Evidence from a mixed methods study in Jamaica” given we studied a single park. In the manuscript we cited references pertaining to the contributions of public parks on physical activity in the Background section, page 4, paragraph 3 lines 23-25 and page 5 line 1. However the design of the SOPARC methodology, which we outlined in the Methods section of the manuscript, does not facilitate assessing participating rate, equality and diversity. Data on accessibility of various areas of the park were collected under the SOPARC methodology, and reliability of observers in assessing this feature presented under the Results section, subsection ‘Reliability’ page 12 lines 7-11.

2. Integrate the data from different resource: The study applied different methods to collect data, but did not integrate the data into the results or discussion. The suggestion for this study is to prove the major issues from different data approaches.

Response: The integration of the qualitative and quantitative data has been addressed in the Results section, subsection ‘Qualitative findings’ first paragraph, page 17, lines 8-11. The relationship between the quantitative and qualitative findings is defined. It is also addressed in the Discussion section (paragraph 2, page 21, lines 21-25 and page 22, lines 1-2) that comments on the complex relationship between the attributes of the park and its use for physical activity and various forms of recreation.
3. Clarify the study unit: The paper did not define the study unit.

Response: Thanks for pointing out this oversight. In the Methods section, subsection ‘Data analysis’ on page 10, we have inserted the following sentence at line 20, “The units of observation were the counts observed (observations).”

For example, at the Table 1 Total Women Activity (n=5179), did the study observe 5179 women or women’s activities?

Response: Thanks for the opportunity to clarify this point. In Table 1 the Total Women Activity (n=5179) has now been renamed to Total Female Activity (n=5179), for greater accuracy, since children were also observed. Following the SOPARC protocol, females were first scanned in each designated target area and the data collectors were trained to record both the level of physical activity, that is sedentary, walking or vigorous activity, as well as the observed age group category, for each person observed. The n=5179 represents the total number of females’ activities recorded for all the observations done. To improve on clarity, we have also edited the last sentence under the Methods section, subsection “Quantitative assessment using systematic observation” paragraph 2, page 8, lines 12-13 to now state “Separate scans were done for each sex, firstly females and then males.”

Matthew Dennis (Reviewer 2): The authors conduct work of a timely nature given the context of rising obesity linked to reduced physical activity in the study population. This background and the need for this study is generally well presented as are the methods.

However, the rationale and objective of the analytical approach taken was less clear to me, as were the means by which the data were interrogated. For example, the title suggests that this study will illuminate the role of public parks (plural) on physical activity. However, the study appears to focus primarily on difference between the physical activity of men and women and between age groups at one location. The latter is said to be "known" for a propensity of users engaged in physical activity but neither the details of this, nor a reference to the evidence, are provided.

Response: Thank you for these comments. We have changed the title of the study to “Use of a public park for physical activity in the Caribbean. Evidence from a mixed methods study in Jamaica” given we studied a single unique park, the Emancipation Park. We also provided additional details on the uniqueness of Emancipation Park and the rationale and objective of the analytical approach in the Background section, paragraphs 4 and 5, page 5 lines 9-25 and page 6 lines 3-8.
That difference in PA exists between male and female park users is of interest in itself, though such insight appears to confirm rather than build on the literature cited, so I was left questioning why there was such a seemingly singular focus on comparing men and women rather than comparisons between target areas, age groups or between activity levels.

Response: We appreciate the opportunity to explain this seemingly singular focus. The SOPARC methodology, used for the quantitative aspect of this mixed methods study, stipulated recording total observations (counts) in designated target areas of the park by first scanning females then males and recording as counts, both the level of physical activity observed, that is sedentary, walking or vigorous activity, as well as the observed age group category for each person. All the quantitative results of this study reflect the sex-specific nature of how observations were undertaken.

What, for example was the central research question?

Response: We stated the aims and objectives of our study in the Background section, paragraph 5, page 6 lines 3-6. Specifically, the aims of this study were to a) obtain baseline data on current usage patterns and mean EE in Emancipation Park, a large public park locally known for unusually large numbers of persons that routinely use it for PA and b) gain additional insights into how and why persons use Emancipation Park for PA.

Were there hypotheses related to the different groups?

Response: Thanks for pointing out this important omission. The hypotheses are now included in the Background section, paragraph 5, page 5 lines 18-20.

Why there was no attempt to estimate statistically significant differences between age bracket and target area, for example, is not clear. This is a shame given the large and seemingly rich dataset that was generated through the field work carried out.

Response: We agree with this observation. We have now included in the Results section, subsection ‘Sex-Specific Park Use’, paragraph 4, page 15 lines 5-10 and in Table 2, Chi-squared tests results on the counts of persons within four target areas and the three age group categories and presented the statistically significant differences.
The 27 target areas are not given any description nor assigned to categories. If in some way (e.g. by design, location, light, aesthetic or functional characteristics) the different target areas comprised discrete zones, there would be merit in testing which of these supported greatest observed levels of the behaviours of interest.

Response: Thank you for this suggestion. We have collapsed the target areas into 4 categories based on anticipated highest use for PA and highest levels of moderate to vigorous physical activity (MVPA).

Clearly some (seven) of these areas were "high use" implying that 20 were low use, but was there are gradient of use and could lower scoring areas be grouped to look at difference in the characteristics which might lead to their respective mean EE scores?

Response: We have redone the analysis according to 4 newly created target area type categories based on hypothesized levels of the intensity of physical activity. We present the findings in the Results section, subsection ‘Energy Expenditure’ where we have replaced Table 4 from our original submission with Table 3 and the accompanying narrative in the revised submission on page 16, lines 6-11.

This could be done through tests such as ANOVA - i.e. on the EE values - between target areas with similar characteristics or discriminant function analysis based on high, med, low EE levels as groups and area characteristics as variables.

Response: We agree with this suggestion and performed ANOVA for the mean EE values across target area groups. The revised Table 3 on page 16 shows the mean EE values within the four target area types as categorized by sex and in total, and F-statistics and p-values are also presented. The statistical significance from the ANOVA output is also described in the Results section, subsection ‘Energy Expenditure’ on page16, lines 6-11. Since an ANOVA was done for the target area groups, we opine there is no need to do a discriminant function analysis.
Grouping sites according to their physical/functional/social characteristics could be done logically or with the help of cluster analysis on key variables. Variables might include PA-relevant factors such as green cover, number/type of facilities, terrain, overall design (e.g. open, forested, trail, promenade). Even if a detailed survey of the physical character of these sites was not undertaken, this could presumably still be carried out providing there have been no major changes since the research was carried out.

Response: As mentioned previously we have now categorized the target areas into 4 categories based on anticipated highest use for PA and highest levels of moderate to vigorous physical activity (MVPA).

Although the methods section suggests that one-way ANOVAs were conducted on mean EE values for the different target areas, these results do not seem to be presented, which is a shame.

Response: Thanks for pointing out this oversight. The one-way ANOVA results on the mean EE values for the different target area types are now presented in the Results section, subsection ‘Energy Expenditure’ on page16, lines 6.118 and in Table 3 on the same page.

Instead the emphasis here appears only to rest on sex (in which case it seems that an independent samples t-test would be more appropriate with only two groups) and, although demonstrating significance, these are ultimately descriptive results which do not test or compare physical elements of the park design itself, questioning the usefulness of the research beyond a simple survey of use.

Response: Thanks for pointing out this important omission regarding the statistical analysis. T-tests for two independent samples were done comparing the mean EEs within the target area types for males versus females and a sentence pointing this out now included in the Methods section, subsection ‘Data Analysis’ on page 10, lines 17-18. The results for this analysis are presented in the Results section, subsection ‘Energy Expenditure’ on page 15, lines 17-19 and continued on page 16, lines 1-5.

I felt that more could have been done with these data and multiple factors could have been explored and/or combined to compare for example patterns of use in target areas per age-group.

Response: The SOPARC methodology limited the ability to perform some of the suggested analyses. For example, the data does not have variables/measurements on an individual basis and so the EE variable could not be analyzed as a dependent variable with the other variables as the independent variable in a general linear model.
Perhaps with clearer headings in the results sections and with figures (e.g. clustered bar charts) to demonstrate the results of Chi-square tests, for example, the analysis would have been more compelling.

Response: We have acted on these suggestions and hope the changes made are now satisfactory. In addition to the analyses discussed previously including the use of Chi-square tests, we have now added two clustered bar charts (Figure 5) to illustrate the respective daily frequencies of females and males within the 3 physical activity level categories. The narrative of these results is now included in the Results section, subsection ‘Sex-Specific Park Use’, paragraph 3, page 15 lines 3-4.

I do feel that further tests offering greater interpretative power, such as ANOVA and general linear models, could be run given the usefulness of the EE variable that was created.

Response: As previously mentioned, we have now included additional results from analyses such as ANOVA. A general linear model could not be done as individual level data was not collected.

I thought the qualitative aspect of the study was somewhat vague. For example, the insistence that participants discuss their understanding of PA versus exercise was unexpected and no rationale for this in relation to the study aims was made. Although some coding of the transcribed interviews is suggested, the results are presented rather as a narrative. Therefore, I felt that there was a missed opportunity to shed light on the quantitative findings. Moreover, with only five interviews, given the high number of overall observations, this element of the mixed methods approach does not in my opinion provide a representative sample (as made clear in Table 5) and seems to detract from the overall rigour of the work.

Response: The qualitative aspect of the research was meant to provide insight and understanding of the underlying reasons and motivations for park use in general but also specifically of physical activity and the use of the park in achieving types and levels. As such participants were selected to provide a variety of views and though limited to 5 in total, each participant provided a unique, detailed account of their perspective of park use that illuminated the quantitative findings.

Interview questions focused on gaining insights into how and why persons use, perceive, create and interpret the use of the Emancipation Park for PA. It was therefore important that the researcher ensured that the term physical activity was being used by participants and researcher in the same way. We agree that participants’ understanding of PA versus exercise was not important for this study. We have also deleted Table 1 that was in the original submission.
Also, from a comparative point of view I felt the study lacked enough context and questions remained for me around, for example, the socio-economic and geographical context of the park. Were there other parks nearby for example for comparison or is this the only option for PA locally? Some images both of the physical location of the parks and the separate target areas would have been useful additions also.

Response: Other parks exist nearby but were not the subject of this research. We focussed on testing the reliability of the SOPARC methodology and obtaining baseline data on this unique park, used by many for physical activity at different levels, and given the limited resources available to conduct the research. We believe that comparison with other parks could be explored in future studies. We have now included a satellite image of Emancipation Park in Figure 1 to illustrate the geographical context of the park and also included 3 photographs (Figures 2, 3 and 4) to show some of the target areas analysed in the study. We have described the park in the Methods section, subsection ‘Study setting’ page 6 lines 13– 26. We are unable to provide additional data on the socio-economic context around the park.

As it is, Figure 1 seems to be a poor representation of the study area without, for example, any legend/key, scale or colour for context. Suitable computer aided design or GIS software would have been a much more preferable option in this case.

Response: We agree with the reviewer’s comments and have removed Figure 1 and replaced it with a satellite image of the Emancipation Park.

In addition, Figure 2 is equally badly composed. The axes are not sufficiently labelled and multiple vectors of different categories are presented together. This information would have made more sense as separate charts (for sex, age, activity for example). In addition it is not clear exactly what Figure 2 adds that is not already given in previous tables.

Response: We have removed Figure 2. This has been replaced with clustered bar charts (Figure 5) to represent the respective daily frequencies of females and males within the 3 physical activity levels, namely sedentary, walking and vigorous.
Due to these shortcomings I recommend that the paper not be considered for publication in its current form but that the authors are invited to address the issues highlighted and reconsider their analytical approach, before submitting a revised manuscript. This should focus on the comparative results between park areas and levels of activity, and how these vary by age and sex, with a more detailed account and discussion of the design and function of these target areas and the presence of statistical significance between them in terms of EE. This, for me, would provide greater insight into the distribution of PA throughout the park. The authors can then speculate with greater certainty the reasons for such differences, supported by the narratives documented through the limited interviews. This I think would be the basis of a more compelling study.

Response: We have edited the manuscript and hope the changes made are satisfactory.

In addition, the presentation of the paper needs to be greatly improved with proper cartographic representation of the study area and its geographical context and detailed descriptions of park observation areas with images.

Response: We agree with the suggestions and have made the necessary edits to the revised manuscript as mentioned previously in our response.

Charles Philip Wheater, PhD (Reviewer 3):

This is an interesting study that could provide a baseline for future work in this geographical region that has been under researched in this topic. There are a number of aspects of the manuscript that should be addressed to reassure the reader that the study is robust.

a) there is no clear justification for the use of this particular park as the focus of the study (see also point c).

Response: Thank you for these comments. Justification for the use of Emancipation Park as the focus of the study is now provided in the Background section, paragraphs 4 and 5, page 5 lines 9-24 and page 6 lines 3-8.
b) the quantitative analysis seems to include parametric analysis on data that may be non-normal (and in some cases is potentially truncated - percentage / proportion data) - it is not clear whether this has been tested and/or addressed.

Response: The sample size of 9945 persons is large and we can apply the central limit theorem in this situation, which makes for robust testing under parametric analysis assumptions. The central limit theorem states that as the sample size gets larger, the sampling distribution of the mean approaches normality. Since the sample mean is assumed to be normal under these conditions then the ANOVA, t-tests and other parametric statistical tests can be utilized.

c) the use of a single park which appears to have unusual characteristics may provide interesting information for planners but this aspect should be included in the major part of the discussion rather than simply included within the limitations section (e.g. the fact that this park does have certain unusual features - facilities, security, etc. - could be portrayed as positive attributes for future park management in order to gain increased usage and level of physical activity from target users).

Response: We appreciate this comment. We have expanded our discussion on the park by inserting additional comments in the Discussion section on page 21, paragraphs 1 and 2 lines 8 – 25, page 22, lines 1-2 and on page 24 lines 23-25 and continued on to page 25 lines 1-2.