Author’s response to reviews

Title: Companion dog acquisition and mental well-being. A community-based three-arm controlled study

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Version: 1 Date: 03 Sep 2019

Reviewer reports:

Maryam Akbarilakeh (Reviewer 1): Dear,

please consider the following:

- study's problem statement is weak! you should emphasize on the problem in your own context which motive you to such a study. there are many evidences exist which certify that animal ownership improve mental well being. as you said in your introduction! then i didnt understand what is your problem ? what is the necessity of your study? correct it.

In the introduction (lines 15-53), we highlight that the majority of studies investigating mental health and human-dog interactions have examined the efficacy of animal-assisted interventions among institutionalised or clinical populations (25-30). These acute interventions are vastly different to the conditions of dog ownership, in which owners are responsible for the complete care of their dog. We also explain that, to our knowledge, there have only been two longitudinal studies to investigate human mental well-being in relation to dog acquisition (33-34). Considering Reviewer Two’s comment below (“the background gives a vivid description of the study objective”), we have decided not to expand the introduction as this may compromise
concision. However, if we have missed any literature regarding dog acquisition and mental well-being among community dog owners, we welcome specific recommendations.

References


the aim of study is not match with your current design and with title!

The aim of this study was to examine potential changes in mental well-being following dog acquisition, using four common measures: loneliness, positive and negative affect, and psychological distress (described in lines 45-47). We have now specified in the aim that our study was focused in community dog owners. By doing so, we have also ensured the aim matches the title: Companion dog acquisition and mental well-being. A community-based three-arm controlled study’.

“The aim of this controlled study was to examine potential changes in mental well-being among community dog owners following dog acquisition, using four common measures: loneliness, positive and negative affect, and psychological distress.”
We used a controlled study including three groups to investigate this aim (described in lines 55-58).

“Upon completion of the baseline measurements, participants self-allocated to one of three treatment groups based on their dog ownership intentions: imminent dog adopters (“dog acquisition”); individuals interested in dog ownership but delayed from acquisition for the study duration (“lagged control”); and individuals who had no interest or plans to acquire a companion dog (“community control”) (Figure 1).”

-what is your main hypothesis? is there any hypothesis?

The study hypothesis was that dog acquisition would have a positive effect on mental well-being. This hypothesis is clearly described and supported by the current literature in lines 7-14 of the introduction.

“It has been suggested that dog ownership can improve human mental well-being through several possible pathways (7). Dogs may provide their owners with social support and companionship (8, 9) and they may also act as catalysts for increased human social interactions (10-12). Acute human–dog interactions have been shown to elicit positive hormonal effects including reduced cortisol concentrations, a biomarker of stress (13-15), and increased oxytocin concentrations (16-19). Dog owners may also be more physically active than non-owners, as a result of dog-walking (20-24), with a well-established link between physical activity and positive mental well-being (3, 4).”

-did your study a case study? is there any socio demographical characteristics in your context which motive you to such a study?

This is not a case control but a prospective study, as explained in the methods section from lines 51-60. We studied a sample of 71 individuals. The baseline sociodemographic characteristics of our sample are provided in Table 1 in the Results section.

- Study Design is near to an association/prediction study instead of controlled study! what did you mean by controlled? randomized controlled trials? study design is not convincing. do you mean Acquire a dog within 1 month as an intervention ? i prefer the survey on comparison these three groups about mental Well-Being. anyway, if you emphasize on controlled study, you should Describe the basics of this type of study thoroughly in your research!

The study design is not a prospective epidemiological study but a non-randomised quasi experimental with two control groups. We did not conduct tests of association, but rather measured changes in mental well-being over an eight-month period. The exposure in each group was controlled (dog acquisition or no acquisition) and data were analysed based on these groups. The study design is described in detail under the sub-heading ‘Study design’ in the methods (lines 49-59).

inclusion and exclusion criteria for the first screening?
The inclusion criteria are detailed in lines 66-73 under the sub-heading ‘Recruitment’ in the Methods section.

“Participants were eligible if they were aged 18 or over; resided within 60km of the Sydney city centre, Australia; had an absence of physical limitations that could prevent walking; and did not currently own a dog or other furry pet (e.g. cat, rabbit) or plan to acquire one for the duration of the study. Individuals who had owned a dog in the 12 months prior to recruitment were excluded from the study. Participants in the dog acquisition group had to acquire a dog within one month of baseline measurements and be the main/joint carer of the dog. Additionally, the dog had to be free of veterinary conditions that would limit low intensity activities such as walking, and not have entered the last quintile of expected lifespan for their breed.”

randomization?

As described in lines 37-41 in the introduction, randomisation is not feasible in this context.

“Randomised controlled trials, in which human participants are randomly allocated to dog ownership, are not feasible in this field (40, 41). Randomised assignment of dogs to uninterested members of the community would raise irreconcilable animal welfare concerns, such as the potential for neglect or inadequate care, including veterinary care. Dog ownership necessitates a substantial time and economic commitment which would also introduce human ethical concerns if uninterested individuals were allocated to dog ownership. As randomised controlled trials are not feasible, the strongest possible design for examining the impact of dog ownership on mental well-being may be controlled studies in which non-owners acquire a companion dog (41).”

References


We also acknowledged the lack of randomisation as a limitation of the study (line 279-280).

“Firstly, there is a lack of randomisation of dog ownership, which is not feasible for this exposure.”

what criteria is the basis for assign people to groups?

Participants self-allocated to their treatment group, described under the sub-heading ‘Study design’ in the Methods section (lines 53-57).
“Upon completion of the baseline measurements, participants self-allocated to one of three groups based on their dog ownership intentions: imminent dog adopters (“dog acquisition”); individuals interested in dog ownership but delayed from acquisition for the study duration (“lagged control”); and individuals who had no interest or plans to acquire a companion dog (“community control”) (Figure 1).”

completely describe baseline assessment results?

The baseline results are presented in Figure 2 which displays the estimated marginal means for questionnaire scores at each time point by dog ownership status.

complete description of intervention?

The intervention was dog acquisition. The dog acquisition group acquired a dog within one month of baseline measures and the lagged control and community control groups did not acquire a dog during the study. This is described in lines 53-57 under the sub-heading ‘Study design’ in the Methods section.

follow up assessment results?

The follow-up assessment results are described in detail in lines 157-176 under the sub-heading ‘Impact of dog acquisition on indicators of mental well-being’. They are also presented in Figure 2.

-validity and reliability of measures should be described. correct it -dimensions of measures should be addressed. your psychological construct is very sensitive, good definition of measures and present the accuracy of measures is necessary.

In lines 89-117 in the Methods section, we provide detailed information regarding the questionnaires. Each questionnaire has shown strong validity and reliability in similar cohorts.

“Loneliness

The UCLA Loneliness Scale (43, 44) is a valid and reliable tool (45, 46) to measure loneliness and social isolation in community populations (34), including multiple Australian cohorts (47-49). The 20-item questionnaire provides brief descriptions of feelings, such as ‘I am unhappy doing so many things alone.’ Participants reported how often they believed each description was indicative of them. The possible responses were never (0), rarely (1), sometimes (2) and often (3). Individual item scores were then added to provide a total score, with a possible range of 0 to 60(44).

Positive and Negative Affect
The Positive and Negative Affect Schedule (PANAS)(50), and its short form(51) are valid and reliable tools to measure affect (52-54) and have been used in similar Australian community cohorts(55-57). The Short PANAS, used in the current study, consists of 10 adjectives describing positive (5) or negative (5) emotions. Participants indicated the intensity of each emotion during the previous week with possible answers ranging from very slightly or not at all (1) to extremely (5). Total positive and negative affect scores were calculated by adding the scores of each relevant item, with possible scores ranging from five to 25(53).

Psychological distress

Kessler10 (K10) is a 10-item questionnaire which uses a Likert-type scale to measure psychological distress, specifically anxiety and depression, over the most recent 28-day period(58). Participants were asked questions such as ‘During the last four weeks, about how often did you feel nervous?’ with 5 possible responses: none of the time (1), a little of the time (2), some of the time (3), most of the time (4) and all of the time (5). K10 has been used extensively across various populations and exhibits good psychometric qualities (59-61). A total K10 score was calculated by summing the individual item scores, with a range of scores from 10 (no distress) to 50 (extreme distress)(62).

-results;

-you may show the Comparison of Well-Being between three groups by diagram or table. you may show the descriptive statistics and t-test results on the measures by ownership status by table. and so on. results should be revised after you did corrections and clarify the methodology and your main objectives and hypothesis.

Figure 2 presents the estimated marginal mean scores (adjusted for age and sex) for loneliness, positive and negative affect, and psychological distress by study group. Table 1 presented the baseline characteristics of participants who completed the study and were entered in the main analyses (n=71).

-where is ethics considerations about your study?

The ethical considerations of the study are provided in lines 78-81 of the Methods section, under the sub-heading ‘Recruitment.’

“Ethical approval was obtained from the University of Sydney Human Research Ethics Committee (2016/921) and Animal Ethics Committee (2017/1134). The study was registered with the Australian New Zealand Clinical Trials Registry (ACTRN12617000967381). All methods were performed in accordance with the relevant guidelines. All participants provided informed written consent.”

discussion part;
-you should write about the implications of your study for your context and of course for the whole body knowledge in this domain

The implications of the study are discussed in detail in the Discussion section (lines 218-290). Here, we also consider our findings in the context of the broader literature in the discussion. Following Reviewer Two’s comment below (Discussion, The section is well-written by the authors) we have decided not to update the discussion.

-conclusion part; write conclusion?

The conclusion is provided at the end of the manuscript under the heading ‘Conclusions’ (lines 293-297).

“In this sample of Australian urban dog owners, acquisition of a dog was associated with a reduction in loneliness within three months, with the observation persisting to the end of the study. Our results are suggestive of a relatively rapid, positive impact of dog acquisition on some indicators of human mental well-being. Our study provides preliminary, albeit unique, insights to inform future larger controlled studies on the relationship between dog ownership and human mental health.”

-where are the limitations of your study??

Be Lucky

The limitations of the study are provided in the last paragraph of the discussion (lines 278-290).

“There are also several limitations of the study which necessitate cautious interpretation of our findings. Firstly, there is a lack of randomisation of dog ownership, which is not feasible for this exposure. There is also a lack of allocation concealment and blinding. As a result, selection bias may have occurred due to participants’ self-selection to their group. We also found differences between the treatment groups in terms of age and education. To reduce the possible impacts of these imbalances, we investigated changes in mental well-being over time and adjusted for both age and education. However, it must be noted that the adjustment for education nullified the results. There was also a significant difference at baseline between the groups in negative affect. The small sample size of the dog acquisition group suggests this analysis may have been statistically underpowered, which could have contributed to the instability in our results. For example, by altering the grouping of participants, such as pooling the control groups, we found some results were inconsistent with the primary analyses. Finally, the absence of males in the dog acquisition group may limit the generalisability of our findings.”

Samson Olaoluwa Agbaje, Ph.D. (Reviewer 2): Reviewer’s Comment on Manuscript #PUBH-D-19-03078 entitled "Companion dog acquisition and mental well-being: A community-based three-arm controlled study."
Recommendation

Minor correction

Abstract

The abstract was well-written and explicit.

Thank you.

Introduction

The introduction provides a piece of quality empirical evidence on the link between dog ownership and positive mental well-being in humans. The background gives a vivid description of the study objective. However, I observed that authors gave justification for studying loneliness and psychological distress and omitted the rationale for the positive and negative affect/emotions. Furthermore, there was a typographical error (repetition of the phrase would raise) in lines 46 - 47 on page 4. I think the study background provides sufficient data on the current empirical evidence, the study rationale, and design.

Thank you for this comment. We have now amended the typographical error and included additional information on our rationale for investigating positive and negative affect (lines 18-19).

“Among university students, dog-assisted interventions have also demonstrated that acute human–dog interactions have beneficial effects on measures of positive and negative affect (31, 32).”

References


Methods

In the methods section (line 21-23), the authors indicated that the primary outcome was to examine the impact of community-based dog ownership on human physical activity. The authors failed to inform readers about the study aim in the introduction. The information and justification provided focused mainly on secondary outcomes. Therefore, the authors need to provide
information on how PA was assessed among the participants at the baseline (i.e., objective or subjective assessment).

This study formed part of a larger study in which the primary aim was to examine the effects of dog acquisition on PA. The larger study included both objective and subjective measures of PA. However, an examination of PA was beyond the scope of this manuscript and will be detailed elsewhere. We have now provided some further information to clarify this (lines 50-53).

“This study formed part of a larger three-arm controlled study in which the primary aim was to investigate the impact of community-based dog ownership on device-based and self-reported human physical activity (to be reported in detail elsewhere). Indicators of mental well-being were considered as secondary outcomes in the larger study, but are the primary outcomes of the current manuscript.”

Questionnaires/outcome measures

The questionnaires used for data collection are appropriate. However, I am about the reliability of the UCLA loneliness scale in the Australian population. The authors did not provide information on any previous studies that used the instrument for data collection in an Australian setting. Such information could help the reader evaluates the psychometric qualities of the UCLA Loneliness Scale in an Australian context.

We have now included some additional information about the use of the UCLA Loneliness Scale in Australian cohorts (lines 90-91).

The UCLA Loneliness Scale (43, 44) is a valid and reliable tool (45, 46) to measure loneliness and social isolation in community populations (34), including multiple Australian cohorts (47-49).

References


Statistical analysis

I appreciate the authors' crisp explanation of the statistical analyses. However, I am concerned about the rationale behind the supplementary pooled analyses. From the study, the LC and CC groups were exposed to the same intervention. Nevertheless, the intention (though delayed) to acquire a dog in the LC participants was more pronounced. This attribute could have a profound effect on the results of pooled analyses. This procedure might have introduced inconsistencies in the results, as acknowledged by the authors in the study limitations section. I think such an extraneous factor/attribute that could not be accurately measured might have introduced "response bias." Thus, combining the two groups (pool) could undermine the validity and generalizability of the findings. The authors need to report this as a study limitation.

We agree that there are potential underlying differences between individuals who have expressed an interest in dog ownership and those who have no interest in ownership. By investigating changes over time in each group, we hoped to reduce the possible influence of these potential differences. Nonetheless, we agree that the pooling of the two control groups may have influenced the results of the supplementary analyses and have now updated the study limitations to include this information (lines 287-291).

“For example, by altering the grouping of participants, such as pooling the control groups in the supplementary analyses, we found some results were inconsistent with the primary analyses. The pooling of control participants may also have introduced response bias because participants who expressed an interest in dog ownership may be inherently different from those with no ownership intentions.”

Also, the authors did not give information/criteria for the interpretation of effect sizes, as recommended by Cohen (1988).

Thank you for this comment. We have provided partial eta squared ($\eta^2_p$) as a measure of effect size in the results section. We have also included an interpretation of these effect sizes according to Cohen (1988) in the discussion section.
Lines 221-223

“Following dog acquisition, we observed a moderate reduction (64) in loneliness within three months, with the observation persisting until the end of the study.”

Lines 255-257

“We did not find evidence that dog acquisition influenced positive affect although, there was a significant difference in the lagged control group, with a moderate reduction (64) in positive affect at three months.”

Lines 258-259

“Considering negative affect, we found evidence that dog acquisition was associated with a moderate reduction (64) among dog adopters.”

References


Results

In the results section, Line 35-38, the authors reported that there were “no significant differences in baseline characteristics between participants who did not complete the study and the final sample, in terms of age, gender, education, smoking status, alcohol consumption, physical activity, sedentary behavior patterns, loneliness, positive and negative affect, and psychological distress”. I ask the questions: how did the authors measure these outcomes? Also, are lifestyles part of the primary outcomes measured in the study? If yes, the authors should give a more explicit explanation.

Participants provided self-reported data regarding their sociodemographic and lifestyle health characteristics, described in lines 84-87 under the ‘Questionnaires’ sub-heading of the methods section. Lifestyle factors were not a part of the primary outcomes of this manuscript, but are detailed to provide the readers with an understanding of the baseline characteristics of the sample.

“We collected self-reported sociodemographic data including age, gender, level of education, companion animal ownership history, cardiometabolic health and lifestyle health habits, which are described here but will examined in detail elsewhere.”
Furthermore, the authors provided Figure 1 (study design and timeline), which gives valuable information on the study procedures. However, they also need to include the CONSORT flowchart of participants for the intervention.

We have now included a slightly modified CONSORT flowchart for non-randomized controlled trials, based on the CONSORT flowchart and previously published research (Sholler et al., 2015).


Discussion

The section is well-written by the authors.

Thank you.