PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	A Qualitative Focus Group Study of Perceived Barriers and Benefits to Exercise by Self-Described Exercise Status among Older Adults Living with HIV
AUTHORS	Johs, Nikolas; Kellar-Guenther, Yvonne; Jankowski, Catherine M.; Neff, Hadlai; Erlandson, Kristine

VERSION 1 – REVIEW

REVIEWER	Deborah Konkle-Parker University of MS Medical Center, USA
REVIEW RETURNED	25-Sep-2018

GENERAL COMMENTS	This is a well-written paper that addresses an interesting question. Unfortunately, the sample does not reflect the general population of people living with HIV so the information can not be generalized to a wider group. However, it may suffice for their needs of identifying intervention strategies to decrease the sedentary nature of their patient population, whom the sample may reflect.

REVIEWER	Allison Webel Case Western Reserve University, USA
REVIEW RETURNED	08-Oct-2018

GENERAL COMMENTS	Abstract: No comments; well written Article Summary: Minor editorial issues: change explore to explored in the first bullet point; to explored in the first bullet point; Not sure what the recommendations are for this section but it would be nice to see a concluding bullet summarizing " Given these strengths and limitations, we learned…" to help situate the results in the literature. Introduction: Page 5, what do the authors mean by "address" many comorbidities? It's a vague word and it might be helpful to be specific (e.g., prevent, mitigate, overcome the symptoms of, etc) Methods: I got a very good sense of how content analysis was used but how were grounded theory approaches used to create codes and ultimately analyze the data? The authors did a nice job attending to trustworthiness and transferability of the data. Results: Page 8, the authors' state "… benefits to exercisers (n=46) than non-exercisers (n=75..)".. I think the authors mean 46 and 75 quotes not people but it would be helpful to make that clear (since the sample size is 29). The quotations are incredibly illustrative and add a new depth to the literature. Previous work has tended to focus on mostly poor, urban

	populations but these data derive from a seemingly more resourced sample. There are some themes across the populations but importantly there are new themes as well, specifically the data on gyms. Conclusions Page 14, second paragraph "… The ability to be able" that phrase seems redundant. Last sentence same para, suggested re-write: "….specific instructions and wellness (or exercise or physical activity) facilities designed to cater to older adults." The last sentence of the social support/isolation paragraph is a bit awkward and hard to follow. Consider re-writing for clarity. It was mentioned in the results but I don't have a sense of how prominent it is- the insurance support for gym memberships is a policy issue in the SEM. If its more than just a brief mention in the data, I would considering highlighting that since it may become an important advocacy issue for this population. Particularly if you think of adopting some sort of cardiac rehab reimbursement model (e.g., for the gentleman hospitalized with septic shock). Graphics Table 1: Minor but the last row indicates self-reported comorbidities. I was wondering if the participants were asked if they had "hypertension or hypercholestermia" because they might not recognize those terms? Were they asked a general question on comorbidities with free text or were they given options. If the later what were those options (e.g. high blood pressure vs hypertension). This information could be footnoted in the table or added in the methods section. Also, usually there is one default central tendency and dispersion statistic and a footnote for the subsequent ones (n and %). Please let the reader know which was used for each variable so we don't have to guess. Table 2 is a very nice addition to the literature.

REVIEWER	Darren Brown Chelsea and Westminster Hospital NHS Foundation Trust, London, UK
REVIEW RETURNED	15-Oct-2018

GENERAL COMMENTS	In the introduction there has been limited reference to the extensive to the large volume of cochrane reviews that have identified that exercise is safe and effective for people living with HIV, and instead one reference was used. I would encourage the use of the Cochrane reviews. - https://www.ncbi.nlm.nih.gov/pubmed/11279729 - https://www.ncbi.nlm.nih.gov/pubmed/12076422 - https://www.ncbi.nlm.nih.gov/pubmed/15495092 - https://www.ncbi.nlm.nih.gov/pubmed/15846623 - https://www.ncbi.nlm.nih.gov/pubmed/20687068 - https://www.ncbi.nlm.nih.gov/pubmed/27112335 - https://www.ncbi.nlm.nih.gov/pubmed/28403830 It would also be important to identify that exercise is recommended for older adults living with HIV; - https://bmjopen.bmj.com/content/4/5/e004692 It would also be important to identify that people living with HIV are insufficiently physically active (https://www.ncbi.nlm.nih.gov/pubmed/27929355) and are the most sedentary health population (https://www.ncbi.nlm.nih.gov/pubmed/28290767) and

	have the worst cardiorespiratory fitness levels (https://www.ncbi.nlm.nih.gov/pubmed/27713101). In addition there are high rates of dropout from physical activity among people living with HIV (https://www.ncbi.nlm.nih.gov/pubmed/27794625) consequently health professionals such as Physiotherapists are recommended to be included in the multi-disciplinary team to support people living with HIV be more active (https://www.ncbi.nlm.nih.gov/pubmed/27794625). I would like to see more reference to the readiness to engage in physical activity (https://bmjopen.bmj.com/content/6/3/e010029) and how this relates to the episodic nature of disability (https://hqlo.biomedcentral.com/articles/10.1186/1477-7525-6-76). I would also like to see reference to the literature on characteristics that affect exercise behaviours among people living with HIV (https://www.ncbi.nlm.nih.gov/pubmed/20871752) and hypothesis of adherence behaviours specific to goals (https://www.ncbi.nlm.nih.gov/pubmed/22853824). I am unclear what is meant by "major disability" in the methods, to exclude participants. How was this measured or defined. This appears to focus on the presence of impairments or diagnosis of health conditions. These are not adequate proxy's for disability (http://siteresources.worldbank.org/DISABILITY/Resources/Data/MontPrevalence.pdf) and is not using the international language of disability defined within the international classification of functioning, disability and health (ICF) (http://www.who.int/classifications/icf/en/). I am unclear why both grounded theory and content analysis has been identified, as new theories were not developed. I would like further clarity into the methodologies of both qualitative approaches, the rationale for utilising both approaches, and the different purposes with associated outcomes of both approaches, based on theory. The researchers have not identified or acknowledged their standpoint in terms of reflexivity. Page 14 Line 31: The discussion around self-efficacy should also reference the work by Petrockzi, 2010 (https://www.ncbi.nlm.nih.gov/pubmed/20871752) relating to perceived well-being, adherence behaviour and adherence goals (https://www.ncbi.nlm.nih.gov/pubmed/22853824). Page 15, line 18: When discussion augmented social environments it may be worth referencing existing rehabilitation interventions eg: Brown, 2016 (https://www.ncbi.nlm.nih.gov/pubmed/27264319) and discussed methods to mitigate drop-out from physical activity (https://www.ncbi.nlm.nih.gov/pubmed/27794625). Page 16, Line 26: No reflexivity has been documented.

REVIEWER	Krisann K. Oursler, MD Virginia Tech Carilion School of Medicine U.S.A.
REVIEW RETURNED	29-Oct-2018

GENERAL COMMENTS	This qualitative cross-sectional study of older adults with HIV investigates the differences in willingness and beliefs to exercise among self-identified exercisers (n=12) and non-exercisers (n=17) among patients on antiretroviral therapy who do not have a major disability that would preclude exercise. The results provide additional insight into perceived barriers and benefits to exercise among older adults with HIV in addition to novel findings based on self-identified exercise status. Durable exercise strategies in older adults with HIV is an important topic as survival across the world continues to increase. This work helps address the question of the whether adults

	with HIV present unique challenges to durable exercise programs beyond the well-defined personal, environmental, and social barriers. ● The manuscript would be strengthened with a clearer presentation of the results. While the results section is well-organized and describes each of the exercise motivators and barriers by domain, in most cases the findings across exercisers and non-exercisers are discussed with similarities as well as differences. The table attempts to summary these common and different elements but basically provides the conclusion that exercisers perceive more benefits to exercise and non-exercises perceive more barriers. The number of participants in each group should be added to the table. If possible, qualitative statistics should be performed that account for the unequal group size and allow the reader to determine if the differences in barriers are meaningful. ● A major limitation of the study is that exercise status is self-described, which is acknowledged by the authors but is a detail omitted in the abstract. The exclusion of patients that have a "major disability that would preclude exercise" warrants inclusion in the discussion of study limitations as this significantly affects generalizability of findings. Further details or a reference on this exclusion criterion also needs to be included in the method section. This study is noted to be registered in Clinical Trials.gov, listed as an exercise trial, which raises the question if participants in this qualitative study were selected from individuals recruited for the exercise trial, rather than HIV clinics at large as stated. ● The analysis and coding of the focus group transcripts are described in detail and are a strength of the study. Additional details should be provided on conduct of the focus groups, which were led by a single investigator who is an HIV care provider. Was this investigator blinded to the group status (exercisers or non-exercisers)? Were patients directly under the HIV care of this investigator included in the study?

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Reviewer Name: Deborah Konkle-Parker
Institution and Country: University of MS Medical Center, USA
Please state any competing interests or state 'None declared': None declared

This is a well-written paper that addresses an interesting question. Unfortunately, the sample does not reflect the general population of people living with HIV so the information can not be generalized to a wider group. However, it may suffice for their needs of identifying intervention strategies to decrease the sedentary nature of their patient population, whom the sample may reflect.

• Thank you for this comment. We absolutely agree that some of the findings in our study may not be generalizable to the general HIV population, and have mentioned this as a limitation in our discussion. However, our population of older men and women with a long duration of HIV does reflect the HIV epidemic in many urban US areas. As such, we believe that this work will help to inform the development of future interventions targeting this population as well as other groups of older, sedentary adults with health disparities.

Reviewer: 2
Reviewer Name: Allison Webel

Institution and Country: Case Western Reserve University, USA
Please state any competing interests or state 'None declared': None declared

BMJ Review
Abstract: No comments; well written
Article Summary: Minor editorial issues: change explore to explored in the first bullet point; to explored in the first bullet point; Not sure what the recommendations are for this section but it would be nice to see a concluding bullet summarizing " Given these strengths and limitations, we learned…" to help situate the results in the literature.

• Thank you for the suggestions. We have changed the tenses on explore as suggested. Per the instructions to the author, this section is to discuss the methods and should not include any results or discussion.

Introduction:
Page 5, what do the authors mean by "address" many comorbidities? It's a vague word and it might be helpful to be specific (e.g., prevent, mitigate, overcome the symptoms of, etc)

• Thank you for this suggestion. We have changed "address comorbidities" to "prevent negative long-term health outcomes associated with comorbidities".

Methods: I got a very good sense of how content analysis was used but how were grounded theory approaches used to create codes and ultimately analyze the data? The authors did a nice job attending to trustworthiness and transferability of the data.

• Thank you for the opportunity for further clarify: We had used the description of "grounded theory" because we used inductive coding when first reviewing the transcripts. We subsequently went to the literature to determine whether existing theories fit our data. We found that while the SEM model described many of our themes, our participants shared little mention of organizational or policy level factors. We then went back to the codebook and added additional codes using a deductive approach based on literature around the SEM model and our data from a previous focus group study, combining with the codes we developed using the inductive approach.
• To address the reviewer concerns, the term 'grounded analysis' has been removed since we did not fully utilize this approach by developing a new theory from the data. Please see the new wording in the methods section (page 7) that better clarifies the process that we use: "First, rather than starting with a theory like SEM, the team created a codebook using inductive coding and content analysis approaches in combination to identify broad themes related to facilitators and barriers to exercise for older PLWH. More specifically, the transcripts were read, and coders created an initial coding scheme based on the patterns seen in the first pass-through. Codes were then added using a deductive approach with a list of key domains developed from a prior set of focus groups (in PLWH), as well as prior literature for exercise barriers in older adults and PLWH"

Results: Page 8, the authors' state "… benefits to exercisers (n=46) than non-exercisers (n=75..)".. I think the authors mean 46 and 75 quotes not people but it would be helpful to make that clear (since the sample size is 29).
The quotations are incredibly illustrative and add a new depth to the literature. Previous work has tended to focus on mostly poor, urban populations but these data derive from a seemingly more resourced sample. There are some themes across the populations but importantly there are new themes as well, specifically the data on gyms.

• Thank you for catching this! The 'n' represents the number of times that the topic was mentioned (clarified on page 8).

Conclusions
Page 14, second paragraph "… The ability to be able" that phrase seems redundant. Last sentence same para, suggested re-write: "….specific instructions and wellness (or exercise or physical activity) facilities designed to cater to older adults."
The last sentence of the social support/isolation paragraph is a bit awkward and hard to follow. Consider re-writing for clarity.

• As suggested by the reviewer, we removed "be able to", edited the last sentence in last paragraph of page 14 as above, and edited the last sentence of social support paragraph to "Effective physical activity initiation and maintenance among older PLWH may be strengthened by a robust social environment.

It was mentioned in the results but I don't have a sense of how prominent it is- the insurance support for gym memberships is a policy issue in the SEM. If its more than just a brief mention in the data, I would considering highlighting that since it may become an important advocacy issue for this population. Particularly if you think of adopting some sort of cardiac rehab reimbursement model (e.g., for the gentleman hospitalized with septic shock).

• The issue of discounted access to gyms was mentioned 14 times across the 4 groups, 9 times by the non-exercisers and 4 times by the exercisers. This was not always directly in reference to insurance, but rather to the cost/expense of gym members, something that could presumably be mitigated through insurance coverage. We have accordingly added a sentence to the discussion to comment on the issue of cost and transportation: "The most salient theme identified that may serve as an issue for future policy-level changes would be access (cost and transportation) to a gym, which was identified as a barrier by both exercisers and non-exercisers."

Graphics
Table 1: Minor but the last row indicates self-reported comorbidities. I was wondering if the participants were asked if they had "hypertension or hypercholestermia" because they might not recognize those terms? Were they asked a general question on comorbidities with free text or were they given options. If the later what were those options (e.g. high blood pressure vs hypertension). This information could be footnoted in the table or added in the methods section. Also, usually there is one default central tendency and dispersion statistic and a footnote for the subsequent ones (n and %). Please let the reader know which was used for each variable so we don't have to guess.

• Thank you for the suggestion. We have specified the n/% as a footnote on Table 1, as requested. We have also clarified the wording on the self-reported co-morbidities. We did use more patient-centric terminology (i.e., high blood pressure) for most of the terminology and do not feel that this greatly underestimated the self-report of these targeted comorbidities.

Table 2 is a very nice addition to the literature.
• Thank you!

Reviewer: 3
Reviewer Name: Darren Brown
Institution and Country: Chelsea and Westminster Hospital NHS Foundation Trust, London, UK
Please state any competing interests or state 'None declared': None

In the introduction there has been limited reference to the extensive to the large volume of cochrane reviews that have identified that exercise is safe and effective for people living with HIV, and instead

one reference was used. I would encourage the use of the Cochrane reviews.
- https://www.ncbi.nlm.nih.gov/pubmed/11279729
- https://www.ncbi.nlm.nih.gov/pubmed/12076422
- https://www.ncbi.nlm.nih.gov/pubmed/15495092
- https://www.ncbi.nlm.nih.gov/pubmed/15846623
- https://www.ncbi.nlm.nih.gov/pubmed/20687068
- https://www.ncbi.nlm.nih.gov/pubmed/27112335
- https://www.ncbi.nlm.nih.gov/pubmed/28403830

• We would like to thank the reviewer for this tremendous list of resources. We have included many of these additional suggested references.

It would also be important to identify that exercise is recommended for older adults living with HIV;
- https://bmjopen.bmj.com/content/4/5/e004692

• Thank you for this suggestion. We have added the reference and the recommendation.

It would also be important to identify that people living with HIV are insufficiently physically active (https://www.ncbi.nlm.nih.gov/pubmed/27929355) and are the most sedentary health population (https://www.ncbi.nlm.nih.gov/pubmed/28290767) and have the worst cardiorespiratory fitness levels (https://www.ncbi.nlm.nih.gov/pubmed/27713101). In addition there are high rates of dropout from physical activity among people living with HIV (https://www.ncbi.nlm.nih.gov/pubmed/27794625) consequently health professionals such as Physiotherapists are recommended to be included in the multi-disciplinary team to support people living with HIV be more active (https://www.ncbi.nlm.nih.gov/pubmed/27794625).

• Thank you for these additional suggestions. We have added the first citation added to introduction paragraph. The 2nd citation is already incorporated in our background and discussion. We agree with the reviewer's suggestion that physiotherapists are a valuable resource to the multi-disciplinary team. However, we have not included the last 2 references, as these are not directly relevant to our discussion points.

I would like to see more reference to the readiness to engage in physical activity (https://bmjopen.bmj.com/content/6/3/e010029) and how this relates to the episodic nature of disability (https://hqlo.biomedcentral.com/articles/10.1186/1477-7525-6-76).

• Thank you for these suggestions. We agree that these are valuable discussion points with regards to physical activity. We have included the first reference mentioned in the introduction. Unfortunately, due to word count constraints, we are not able to expand upon the episodic nature of disability in this population.

I would also like to see reference to the literature on characteristics that affect exercise behaviours among people living with HIV (https://www.ncbi.nlm.nih.gov/pubmed/20871752) and hypothesis of adherence behaviours specific to goals (https://www.ncbi.nlm.nih.gov/pubmed/22853824).

• Thank you for these additional references. We have the additional references in the discussion to give more context on the importance of mental health as was described by our participants. We felt that the social ecological model best described the data that we observed with our participants, and unfortunately have little room to expound on other theoretical models or discuss approaches of other specific exercise interventions.

I am unclear what is meant by "major disability" in the methods, to exclude participants. How was this

measured or defined. This appears to focus on the presence of impairments or diagnosis of health conditions. These are not adequate proxy's for disability (http://siteresources.worldbank.org/DISABILITY/Resources/Data/MontPrevalence.pdf) and is not using the international language of disability defined within the international classification of functioning, disability and health (ICF) (http://www.who.int/classifications/icf/en/).

• Thank you for the suggestion to further clarify this point: this referred to patients that was not ambulatory (e.g. someone completely wheelchair bound, paraplegia). As long as our participants were able to participate in some form of exercise (regardless if it was limited by functional status), we felt the comments would be relevant to exercise behaviors. During recruitment, no one was excluded for this reason, though our participants did describe a range of current functional status. We have added this additional clarification to the methods.

I am unclear why both grounded theory and content analysis has been identified, as new theories were not developed. I would like further clarity into the methodologies of both qualitative approaches, the rationale for utilising both approaches, and the different purposes with associated outcomes of both approaches, based on theory.

Please see response to reviewer #2 above.

The researchers have not identified or acknowledged their standpoint in terms of reflexivity.

Thank you for noting this: we added a statement to the methods section to clarify relationship of investigator to participants.

Page 14 Line 31: The discussion around self-efficacy should also reference the work by Petrockzi, 2010 (https://www.ncbi.nlm.nih.gov/pubmed/20871752) relating to perceived well-being, adherence behaviour and adherence goals (https://www.ncbi.nlm.nih.gov/pubmed/22853824).

This reference has been added.

Page 15, line 18: When discussion augmented social environments it may be worth referencing existing rehabilitation interventions eg: Brown, 2016 (https://www.ncbi.nlm.nih.gov/pubmed/27264319) and discussed methods to mitigate drop-out from physical activity (https://www.ncbi.nlm.nih.gov/pubmed/27794625).

• Thank you for these additional statements. We have added the Brown reference to the discussion surrounding importance of physical health for adherence to exercise interventions. As our participants are not currently in an exercise regimen, and factors related to drop-out from exercise regimens are not directly related to the focus of this paper.

Page 16, Line 26: No reflexivity has been documented.

• We added a statement to the methods section to clarify relationship of investigator to participants.

Reviewer: 4
Reviewer Name: Krisann K. Oursler, MD
Institution and Country: Virginia Tech Carilion School of Medicine, U.S.A.
Please state any competing interests or state ‘None declared’: None declared

The manuscript would be strengthened with a clearer presentation of the results. While the results

section is well-organized and describes each of the exercise motivators and barriers by domain, in most cases the findings across exercisers and non-exercisers are discussed with similarities as well as differences. The table attempts to summary these common and different elements but basically provides the conclusion that exercisers perceive more benefits to exercise and non-exercises perceive more barriers. The number of participants in each group should be added to the table. If possible, qualitative statistics should be performed that account for the unequal group size and allow the reader to determine if the differences in barriers are meaningful.

• Thank you for these suggestions. We have added the number of participants in each group to Table 2 and added addition detail to Table 1 as suggested by Reviewer #2. We agree with the reviewer, that indeed, exercisers perceive more benefits and non-exercisers perceive more barriers. As such, we feel that helping non-exercisers realize and overcome their identified barriers may be an important component of physical activity interventions among older adults with HIV moving forward.

• As a qualitative analysis, we did not feel that statistical analyses would be appropriate, for one primary reason. Though we highlight the difference in barriers/motivators between the groups, our intent is not to argue a statistically significant difference; instead, we hope that the themes can be examined within the broader context of the literature to help inform strategies or approaches towards designing interventions for physical activity in this population.

A major limitation of the study is that exercise status is self-described, which is acknowledged by the authors but is a detail omitted in the abstract.

• We agree that this is an important limitation and include this in the abstract: "…examine the differences in perceived barriers and benefits to exercise among older PLWH by self-identified exercise status"

The exclusion of patients that have a "major disability that would preclude exercise" warrants inclusion in the discussion of study limitations as this significantly affects generalizability of findings.
Further details or a reference on this exclusion criterion also needs to be included in the method section.

• Please see response to reviewer #3 above.

This study is noted to be registered in Clinical Trials.gov, listed as an exercise trial, which raises the question if participants in this qualitative study were selected from individuals recruited for the exercise trial, rather than HIV clinics at large as stated.

• The current study was funded as a supplement to the exercise study listed on clinicaltrials.gov. The supplement supported a qualitative study involving both the participants in the exercise intervention, and participants that were not involved in the exercise intervention (the study detailed within this manuscript). The participants in this study were not involved in the exercise intervention and were recruited from HIV clinics as stated.

The analysis and coding of the focus group transcripts are described in detail and are a strength of the study. Additional details should be provided on conduct of the focus groups, which were led by a single investigator who is an HIV care provider. Was this investigator blinded to the group status (exercisers or non-exercisers)? Were patients directly under the HIV care of this investigator included in the study?

• The investigator and research assistant that conducted the focus groups were not blinded to the self-described exercise status of the patients, though the same list of prompts and questions were

used for each group. The investigator was a provider for 4 of the total 29 patients in the study. This has been added to methods section.

VERSION 2 – REVIEW

REVIEWER	Alison Webel Case Western Reserve University, USA
REVIEW RETURNED	13-Dec-2018

GENERAL COMMENTS	The authors concisely attended to the minor comments made in the first review. I remain enthusiastic about the potential impact of this manuscript on the field and have no additional suggestions and thank the authors for their work.

REVIEWER	Darren Brown Chelsea and Westminster Hospital NHS Foundation Trust, United Kingdom
REVIEW RETURNED	21-Dec-2018

GENERAL COMMENTS	All of my previous comments have been addressed fully with careful consideration.

REVIEWER	Krisann Oursler Virginia Tech Carilion School of Medicine, USA
REVIEW RETURNED	18-Dec-2018

GENERAL COMMENTS	The authors were very responsive to comments from all 4 reviewers. The manuscript has been greatly strengthened with several additional reference, more detailed and applicable methods, and a revised discussion that allows readers to appreciate the impact of the findings to future policy-level changes. Only minor issue that I suggest is resolved prior to publication is the one of eligibility criteria. “Major disability” is a misleading exclusion criterion and not a synonym for “ambulatory”. If ambulation without an assist device was the only eligibility criteria with regards to physical function, then suggest that is stated as such.

VERSION 2 – AUTHOR RESPONSE

In regards to the comment from Reviewer #4, our exclusion criteria was specifically "the inability to participate in any form of exercise. Participants with severe activity limitations will still be eligible, as they could still participate in balance training, band resistance, etc." We agree that this may differ from non-ambulatory, and have removed this from the text. The revised (highlighted) text now reads: "Exclusion criteria included inability to provide consent, inability to speak English, or inability to participate in any form of exercise."