PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Navigator Program for hospitalized adults experiencing homelessness: protocol for a pragmatic randomized controlled trial
AUTHORS	Liu, Michael; Pridham, Katherine; Jenkinson, Jesse; Nisenbaum, Rosane; Richard, Lucie; Pedersen, Cheryl; Brown, Rebecca; Virani, Sareeha; Ellerington, Fred; Ranieri, Alyssa; Dada, Oluwagbenga; To, Matthew; Fabreau, Gabriel; McBrien, Kerry; Stergiopoulos, Vicky; Palepu, Anita; Hwang, Stephen

VERSION 1 – REVIEW

REVIEWER	Raven, Maria University of California, Emergency Medicine
REVIEW RETURNED	11-Sep-2022

GENERAL COMMENTS	This is a clearly written study protocol and I have a few relatively minor points: 1) Why not follow housing as an outcome? I find it strange that no outcomes related to housing are included, even though connection to housing resources is one of the activities of the case manager, and considering that housing in and of itself will likely provide participants with the best chance for improved health. While 14d PCP follow-up is important, I don't find it that meaningful as a primary outcome, and it seems that there should be some measure of outpatient follow-up beyond that single measure at 14d (in addition to the other acute, non PCP service use outcomes like ED use and hospitalizations). 2) How will study staff and case managers stay in touch with participants who do not have cell phones? No reference is made to this.... 3) the references are slightly outdated. Consider including both of these more recent references: Raven MC, Niedzwiecki MJ, Kushel M. A randomized trial of permanent supportive housing for chronically homeless persons with high use of publicly funded services. Health Serv Res. 2020 Oct;55 Suppl 2(Suppl 2):797-806. doi: 10.1111/1475-6773.13553. PMID: 32976633; PMCID: PMC7518819. Raven MC, Tieu L, Lee CT, Ponath C, Guzman D, Kushel M. Emergency Department Use in a Cohort of Older Homeless Adults: Results From the HOPE HOME Study. Acad Emerg Med. 2017 Jan;24(1):63-74. doi: 10.1111/acem.13070. PMID: 27520382; PMCID: PMC5857347.

REVIEWER	Parkes, Tessa University of Stirling, Faculty of Social Sciences
REVIEW RETURNED	05-Oct-2022

GENERAL COMMENTS	Thank you for the invitation to review this manuscript which is a protocol for a pragmatic randomised controlled trial for hospitalised adults experiencing homelessness. The trial is novel and much needed given how little we know currently about outcomes from such interventions with this target population. The paper is well written and contains most of the information I thought was necessary for readers. There are some comments I would like to offer to the authors for consideration. ICES is an independent, non-profit research institute funded by an annual grant from the Ontario Ministry of Health and the Ministry of Long-Term Care. Suggest ICES (page 10) is spelled out. List of abbreviations would be helpful at the end of the paper. Page 15 sub group analyses – I could not see where participants asked about substance use/comorbidities on the questionnaires in order to do such analyses? Page 20 – add event to Town Hall I would be interested to see what accountability and governance arrangements are in place for the trial. For example, is there a data monitoring group or study steering group with academics external to the study team appraising/monitoring trial progress? Are there any progression criteria for the trial? I would have been interested to hear more about the staff who would be staffing the intervention. Are peers/people with lived experience included within the staffing of this model? Was this considered if not? The training/supervision of these staff members would be good to know about too. Relatedly, while there was information on the intervention in terms of what activities were proposed to be undertaken, information on how the intervention is delivered was not clear i.e. relational aspects, trust. There are some papers that might be of interest to cite outside of North America. https://www.rcpjournals.org/content/clinmedicine/16/3/223 https://onlinelibrary.wiley.com/doi/epdf/10.1111/hsc.12474 https://www.journalslibrary.nihr.ac.uk/hta/WVVL4786#/abstract Reference 41 has a newer edition https://www.bmj.com/content/bmj/374/bmj.n2061.full.pdf

REVIEWER	Murray-Krezan, Cristina University of Pittsburgh Department of Medicine
REVIEW RETURNED	13-Oct-2022

GENERAL COMMENTS	This is a well-written protocol paper for an, overall, soundly-designed study to assess the effectiveness of a patient navigator program for participants experiencing homelessness who are discharged from the hospital versus usual care. The outcome measures are appropriate and analyses mostly seem appropriate (some questions, see following). Major points: P 7 Line 45: Authors state when recruitment began, but nowhere in the document do they state the total study duration such as how long the estimate they will be enrolling participants. This should be included. P 9 Lines 10-17: At this point in the review process, this study has been recruiting for one year. I have significant concerns about retention given the proposed method for participant follow-up. Did the study team provide phones for participants so they can contact the study team for the follow-up visit? Given my experience for a different but similarly designed study in a similar population, we are struggling with follow-up even with providing cell phones to participants who need them. Putting the onus on these participants to reach out to the study team to follow-up strikes me as an insufficient retention method. Please include alternative methods your team is using to follow-up with participants or describe how successful this singular method is. P 12 Line 47: Over what time period is the study team assessing all-cause mortality or readmission? The total participant study duration is not explicitly stated (30 (+20) days or 180 days with EHR, or longer?). P15 Lines 3-14: Please justify why you plan to fit both log-binomial and logistic regression models to the primary outcome. Additionally, since these appear to be “simple” models (no additional covariates in the models), why are you also proposing a simple chi-square test to compare proportions attending 14-day follow-up visits as the primary analysis? Minor points: P 3 Line 26: delete and from “Six hundred and forty adults…” P 9 Line 29: include the block sizes used. P 13 Line 18: Is an effect size of 12% and absolute percentage difference? P 19 Line 43: The sentence is missing a period.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Dr. Maria Raven, University of California

Comments to the Author:

This is a clearly written study protocol and I have a few relatively minor points:

Response: We thank Reviewer #1 for their positive and thoughtful review. Below, we provide a point-by-point response to each comment.

1. Why not follow housing as an outcome? I find it strange that no outcomes related to housing are included, even though connection to housing resources is one of the activities of the case manager, and considering that housing in and of itself will likely provide participants with the best chance for improved health. While 14d PCP follow-up is important, I don't find it that meaningful as a primary outcome, and it seems that there should be some measure of outpatient follow-up beyond that single measure at 14d (in addition to the other acute, non PCP service use outcomes like ED use and hospitalizations).

Response: We absolutely agree that housing status is a critically important outcome to assess in this population. However, such data are not available in ICES databases and so we would need to do a separate follow-up interview to ascertain housing status. One longitudinal study in Canada found that even participants with the most "successful" housing trajectories required 18-24 months to achieve stable housing (Aubry et al., 2021; *Annals of the American Academy of Political and Social Science)*. Thus, it is not realistic that the Navigator intervention will have an impact on housing status by the time of the 30-day follow-up interview. Furthermore, it is not feasible with the resources available for this study to conduct additional follow-up interviews several months or years after the intervention period.

Our study team selected follow-up with a PCP within 14 days of hospital discharge as the primary outcome because this measure is most proximally located on the logic model of how the Navigator intervention could improve health. The Homeless Outreach Counsellors also have greater control over directly supporting participants in following-up with PCPs, which is directly linked to better health outcomes in this population (O'Toole et al., 2010; *AJPH*; Luchenski et al., 2022; *eClinicalMedicine*). We certainly agree with Reviewer #1 that other health care utilization outcomes are similarly important, and so we have included them as secondary outcomes, including non-PCP outpatient follow-up, ED visits, and hospital readmissions.

References:

1. **Aubry, T., Agha, A., Mejia-Lancheros, C., Lachaud, J., Wang, R., Nisenbaum, R., ... & Hwang, S. W. (2021). Housing Trajectories, Risk Factors, and Resources among Individuals Who Are Homeless or Precariously Housed. *The ANNALS of the American Academy of Political and Social Science*, *693*(1), 102-122.**
2. **O'Toole, T. P., Buckel, L., Bourgault, C., Blumen, J., Redihan, S. G., Jiang, L., & Friedmann, P. (2010). Applying the chronic care model to homeless veterans: effect of a population approach to primary care on utilization and clinical outcomes. *American journal of public health*, *100*(12), 2493-2499**
3. **Luchenski, S. A., Dawes, J., Aldridge, R. W., Stevenson, F., Tariq, S., Hewett, N., & Hayward, A. C. (2022). Hospital-based preventative interventions for people experiencing homelessness in high-income countries: A systematic review. *EClinicalMedicine*, *54*, 101657.**

2. How will study staff and case managers stay in touch with participants who do not have cell phones? No reference is made to this....

Response: Similar strategies to promote continued study participation are implemented for participants with and without cell phones. For the latter group, the additional contact strategies are implemented immediately instead of calling the participant a few times first. These additional contact strategies include the study team contacting family, friends, and other service providers, as described in the current manuscript. We also contact shelters where participants are currently staying or have stayed in the past, and sometimes go directly to shelter sites to locate participants and interview them on the spot. To date, we have an 81% follow-up rate for the 30-day interviews across all participants (87% in the intervention group and 74% in the usual care group).

3. References are slightly outdated. Consider including both of these more recent references:

   Raven MC, Niedzwiecki MJ, Kushel M. A randomized trial of permanent supportive housing for chronically homeless persons with high use of publicly funded services. Health Serv Res. 2020 Oct;55 Suppl 2(Suppl 2):797-806. doi: 10.1111/1475-6773.13553. PMID: 32976633; PMCID: PMC7518819.

   Raven MC, Tieu L, Lee CT, Ponath C, Guzman D, Kushel M. Emergency Department Use in a Cohort of Older Homeless Adults: Results From the HOPE HOME Study. Acad Emerg Med. 2017 Jan;24(1):63-74. doi: 10.1111/acem.13070. PMID: 27520382; PMCID: PMC5857347.

Response: Thank you, we have incorporated these suggested references.

Reviewer: 2
Dr. Tessa Parkes, University of Stirling

Comments to the Author:

Thank you for the invitation to review this manuscript which is a protocol for a pragmatic randomised controlled trial for hospitalised adults experiencing homelessness. The trial is novel and much needed given how little we know currently about outcomes from such interventions with this target population. The paper is well written and contains most of the information I thought was necessary for readers. There are some comments I would like to offer to the authors for consideration.

Response: We thank Reviewer #2 for their insightful feedback and review. Below, we provide a point-by-point response to each comment.

1. ICES is an independent, non-profit research institute funded by an annual grant from the Ontario Ministry of Health and the Ministry of Long-Term Care. Suggest ICES (page 10) is spelled out.

Response: The research institute was previously known as the "Institute for Clinical Evaluative Sciences", but it formally adopted ICES as its official name as of 2018. Thus, "ICES" is no longer an acronym.

2. List of abbreviations would be helpful at the end of the paper.

Response: We thank Reviewer #2 for this suggestion, but do not believe that *BMJ Open* formatting guidelines allow for an abbreviations section. We have spelled out all abbreviations upon first use throughout the manuscript.

3. Page 15 sub group analyses – I could not see where participants asked about substance use/comorbidities on the questionnaires in order to do such analyses?

Response: Thank you for raising this point. Information about participant alcohol and substance use will be abstracted from the discharge chart review – specifically current alcohol use, number of standard drinks per day, and current illicit drug use (Page 9):

"The research team will also undertake a chart review of hospital records after discharge to ascertain characteristics of the admission, information about discharge, participant health information, and history of alcohol and substance use."

We will also ascertain data regarding whether the patient received care for alcohol and substance use disorders using ICES databases, as discussed in the *Data Linkage* section.

4. Page 20 – add event to Town Hall

Response: We have revised the term "Town Hall" to a more specific term – "Knowledge Sharing Event". Our team has experience conducting similar two-way knowledge sharing, including a recent event for another study focused on the health of people experiencing homelessness (see more details here: https://www.dlsph.utoronto.ca/event/ku-gaa-gii-pimitizi-win-study-two-way-knowledge-sharing/).

5. I would be interested to see what accountability and governance arrangements are in place for the trial. For example, is there a data monitoring group or study steering group with academics external to the study team appraising/monitoring trial progress? Are there any progression criteria for the trial.

Response: Thank you for raising this point. The Navigator Program is continuously reviewed by the Community Expert Group (CEG) at the MAP Centre for Urban health Solutions, a group of diverse individuals with lived experiences of homelessness. In accordance with guidelines from Unity Health Toronto and the Research Ethics Board, this study does not require a Data and Safety Monitoring Board given that study participation entails no to minimal safety risks.

Furthermore, interim analyses cannot be conducted because most outcome data are housed at ICES and will only be accessible to the study team after completion of study recruitment.

6. I would have been interested to hear more about the staff who would be staffing the intervention. Are peers/people with lived experience included within the staffing of this model? Was this considered if not? The training/supervision of these staff members would be good to know about too.

Response: Thank you for these insightful questions. The two current Homeless Outreach Counsellors have extensive experience working with people experiencing homelessness in the community. Both have connections to community-based organizations, strong relationships with service providers, training in harm reduction and person-centered care, and a willingness to be flexible and solutions-focused. Peers are not staffed in the program itself. However, as mentioned above, the study team works closely with a Community Expert Group (composed of diverse individuals with lived experience of homelessness), who have provided and will provide input and feedback on the study at multiple time points, including conception, development, analysis, and knowledge translation.

7. Relatedly, while there was information on the intervention in terms of what activities were proposed to be undertaken, information on how the intervention is delivered was not clear i.e. relational aspects, trust.

Response: Thank you for raising this important point. The Navigator program is indeed rooted in factors such as trust and relationship building. These are factors that were emphasized in the hiring process. Both Homeless Outreach Counsellors have extensive experience working with this population and are therefore well-versed in the relational aspects of providing services to this population. Moreover, the process evaluation that is outlined in the manuscript and Table 3 (Domain 2) will explicitly assess how these factors affect the delivery and impact of the Navigator program. Given space constraints, we have not added additional information about these factors to the current manuscript.

8. There are some papers that might be of interest to cite outside of North America.

   https://www.rcpjournals.org/content/clinmedicine/16/3/223

   https://onlinelibrary.wiley.com/doi/epdf/10.1111/hsc.12474

   https://www.journalslibrary.nihr.ac.uk/hta/WVVL4786#/abstract

   Reference 41 has a newer edition https://www.bmj.com/content/bmj/374/bmj.n2061.full.pdf

Response: Thank you for these suggestions. We have added several more international references, along with a recent systematic review of hospital-based preventative interventions for people experiencing homelessness in high-income countries (Luchenski et al., 2022; *eClinicalMedicine*). We have also replaced the *BMJ* MRC guidance on developing and evaluating complex interventions with the newer edition.

Reference:

1. **Luchenski, S. A., Dawes, J., Aldridge, R. W., Stevenson, F., Tariq, S., Hewett, N., & Hayward, A. C. (2022). Hospital-based preventative interventions for people experiencing homelessness in high-income countries: A systematic review. *EClinicalMedicine*, *54*, 101657.**

Reviewer: 3
Dr. Cristina Murray-Krezan, University of Pittsburgh Department of Medicine

Comments to the Author:

This is a well-written protocol paper for an, overall, soundly-designed study to assess the effectiveness of a patient navigator program for participants experiencing homelessness who are discharged from the hospital versus usual care. The outcome measures are appropriate and analyses mostly seem appropriate (some questions, see following).

Response: We thank Reviewer #3 for their thoughtful questions and review. Below, we provide a point-by-point response to each comment.

Major points:

1. P 7 Line 45: Authors state when recruitment began, but nowhere in the document do they state the total study duration such as how long the estimate they will be enrolling participants. This should be included.

Response: Thank you. Given current monthly recruitment rates of 15-20 participants, we estimate that recruitment of 640 total participants will be completed in approximately three years. We have added this to the manuscript:

"Recruitment began in October 2021 and total recruitment is estimated to be completed in three years." (Page 8)

2. P 9 Lines 10-17: At this point in the review process, this study has been recruiting for one year. I have significant concerns about retention given the proposed method for participant follow-up. Did the study team provide phones for participants so they can contact the study team for the follow-up visit? Given my experience for a different but similarly designed study in a similar population, we are struggling with follow-up even with providing cell phones to participants who need them. Putting the onus on these participants to reach out to the study team to follow-up strikes me as an insufficient retention method. Please include alternative methods your team is using to follow-up with participants or describe how successful this singular method is.

Response: Our study team is not providing cell phones to participants. However, we have implemented several strategies to maximize retention, as outlined in the manuscript (Page 9). As mentioned above in response to Reviewer #1, this includes receiving a comprehensive list of contact information for friends, family members, and service providers during the index hospital admission. We also contact shelters where participants are currently staying or have stayed in the past, and sometimes go directly to shelter sites to locate participants and interview them on the spot. To date, we have an 81% follow-up rate for 30-day interviews across all participants (87% in the intervention group and 74% in the usual care group).

3. P 12 Line 47: Over what time period is the study team assessing all-cause mortality or readmission? The total participant study duration is not explicitly stated (30 (+20) days or 180 days with EHR, or longer?).

Response: Participants in the intervention group will receive support from the Homeless Outreach Counsellor for 90 days after hospital discharge, as outlined on Paged 9-10. The all-cause mortality or readmission outcome will be assessed at 30-days, 90-days, and 180-days post-discharge as outlined on Page 12.

4. P15 Lines 3-14: Please justify why you plan to fit both log-binomial and logistic regression models to the primary outcome. Additionally, since these appear to be "simple" models (no additional covariates in the models), why are you also proposing a simple chi-square test to compare proportions attending 14-day follow-up visits as the primary analysis?

Response: All proposed analyses address the question of testing the effectiveness of the Navigator Program but provide complementary information. More specifically, the chi-square test simply compares outcome proportions between the intervention and control groups. This is usually sufficient in an RCT to test if proportions are different. However, this method does not estimate effect sizes. The effect size can be measured by the risk difference (difference in proportions), the odds ratio (logistic regression), or the risk ratio (log-binomial regression). All analyses are therefore relevant in answering our research questions.

Minor points

5. P 3 Line 26: delete and from "Six hundred and forty adults…"

Response: Done, thank you.

6. P 9 Line 29: include the block sizes used.

Response: Block sizes are either 6 or 8. We have added this to the manuscript.

7. P 13 Line 18: Is an effect size of 12% and absolute percentage difference?

Response: Correct. The estimated effect size of 12% is an absolute percentage difference. This is assuming that the 14-day PCP follow-up rate after hospitalization among people experiencing homelessness is 32% within the usual care group and 44% within the intervention group.

8. P 19 Line 43: The sentence is missing a period.

Response: Thank you for noticing this. We have added the period.

VERSION 2 – REVIEW

REVIEWER	Raven, Maria University of California, Emergency Medicine
REVIEW RETURNED	29-Nov-2022

GENERAL COMMENTS	This manuscript describes a study protocol for a Navigator program designed to improve transitions of care and follow-up for patients experiencing homelessness. It is well written and the sample size calculations are appropriate given the primary outcome of PCP follow-up at 14 days. I wonder if the study team is interested in tracking housing outcomes as well--understanding that this is only a 90d follow-up period, it might make sense to track participants' housing outcomes during that time and possibly even beyond the 90d as the navigator program is assisting with all sorts of needs, housing among them. Otherwise, no concerns based on the protocol.

REVIEWER	Parkes, Tessa University of Stirling, Faculty of Social Sciences
REVIEW RETURNED	17-Nov-2022

GENERAL COMMENTS	Thank you for the opportunity to review this revised manuscript, I believe the authors have responded to the reviewer comments well.

REVIEWER	Murray-Krezan, Cristina University of Pittsburgh Department of Medicine
REVIEW RETURNED	11-Nov-2022

GENERAL COMMENTS	Thank you to the authors for addressing my initial comments. I appreciate the clarifications made to the manuscript as well as the response to me which helped me to reframe the text under question. I commend you on a well-written protocol paper.