

Accessibility of Housing Programs for Brain-Injured Homeless Populations

Final Report

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Title: Accessibility of Housing Programs for Brain-Injured Homeless Populations

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ABSTRACT

INTRODUCTION: Homelessness/unstable housing and traumatic brain injury (TBI) often co-exist. Due to increased occurrence of mental illness, cognitive deficits and substance abuse issues associated with TBI, it can be very difficult for homeless people with brain injury to retain stable housing. The objective of this review was to examine non-institutionalized housing programs for homeless people with acquired and TBI.

METHODS: A search of nine electronic databases including Medline, EMBASE, CINAHL and PsychINFO was completed. Grey literature (Google scholar and Ebsco) searching was also conducted. Any randomized or non-randomized trials, including interventional, observational or descriptive studies were eligible for inclusion. Studies had to examine outcomes of non-institutionalized housing for adult homeless people with acquired brain injury (non-traumatic or traumatic). Two independent reviewers judged study relevance and inclusion.

RESULTS: From 168 citations, 1 published study was included and one abstract remains “pending”. The included study assessed elderly male homeless people with alcohol related brain injury randomized to either an interventional group in a 24/7 supportive residential care environment and intensive behavioural therapy, or to a control group staying in their regular housing situation. The study found that patients living in residential care reported a higher quality of life, in addition to reduced levels of anxiety, depression, and alcohol and tobacco consumption.

CONCLUSIONS: There was only one available study describing or evaluating non-institutionalized housing programs for homeless people with an acquired brain injury or TBI.

What evidence does exist suggests positive outcomes can be achieved. More research is urgently required to establish effective housing strategies for this vulnerable population.

Details

Running Head: Housing for the brain-injured Homeless population

Key words: Brain Injury, homeless, non-institutionalized housing

Document: Abstract: 245 words; Text: words: Tables: 1; Figures: 1; References: ;
Appendix: 1.

INTRODUCTION

Homelessness is an important social issue facing Canada with an estimated cost of 7 billion dollars a year.¹ The state of Homelessness in Canada 2013 report estimates that 200,000 Canadians are homeless during a given year, and that 30,000 are homeless on a given night.¹ While agencies to help the homeless find housing have been developed across North America and around the world, the various health issues faced by the homeless can make finding housing difficult.

The presence of a brain injury is frequent among the homeless population. Indeed, a recent systematic review found the rate of traumatic brain injury (TBI) amongst the homeless population ranged from 8-53% across studies.² Homeless people with a brain injury are more likely to abuse alcohol and drugs,³ and they also have an increased likelihood of mental illness and cognitive deficits, all of which are likely contributing factors in their difficulties to obtain and sustain permanent housing.⁴ As a result, the homeless with brain injuries appear to require a unique perspective from housing agencies to secure suitable housing. Studies have shown that supportive housing programs can successfully help provide stable housing to homeless persons with mental illness.^{5,6} It is unknown, however, if housing programs catering to homeless people with acquired brain injury (ABI; both medical and traumatic) alone are similarly effective.

The objective of this review was to conduct an extensive search of the literature to examine the effectiveness of non-institutionalized housing programs for the homeless with ABI.

METHODS

Protocol: A study protocol was developed *a priori* to define the objectives, outline the search strategy, establish explicit selection criteria, determine the primary outcome, guide the data collection process, and define the analysis.

Research Question: The research question addressed in this review was: For homeless people with an ABI/TBI (population), do non-institutionalized housing programs (intervention) exist and improve health and non-health outcomes (e.g., decrease homelessness, reduce health care use, influence substance use, etc - outcomes) compared to standard care (control)?

Inclusion/Exclusion: Randomized or non-randomized trials examining non-institutionalized housing programs for homeless people with ABI were considered for inclusion. Any interventional, observational, or descriptive studies were also eligible. Potentially eligible studies needed to examine adult (≥ 18 years) samples that were homeless with an ABI. The definition of homeless or brain injury was based on the parameters used by the study author(s) and were to be carefully catalogued. Evaluative studies needed to assess the accessibility of non-institutionalized housing programs for brain-injured homeless people.

Outcome: The primary outcome was the model of non-institutionalized housing programs used by the study authors to find housing for brain-injured homeless people. Secondary outcomes included accessibility of housing, length of time to find housing, duration of housing, housing recidivism, quality of life, and suicide/mortality rates. All outcomes were accepted for analysis. "As reported" analysis was performed.

Search strategy: A systematic search of bibliographic databases including MEDLINE, EMBASE, SCOPUS, LILACS, CINAHL, Global Health, PsychINFO, Sociological Abstracts, and Proquest Dissertations and Theses were conducted to identify any interventional, observational, or descriptive studies. Databases were searched using thesaurus terms and subject headings that were adapted to each database (see Appendix 1).

No limits were applied to the search. For example, foreign language articles were translated using Google Translate; abstracts and unpublished documents were also eligible. The searches went back to 1806 (PSYCHINFO) and the most recent search was conducted in November 2013. Additionally, Ebsco Discovery Federated Search Portal, Access UN, World Health Organization Publications, Catalogue of U.S. Government Publications, Google scholar, and bibliographies from included studies and reviews were searched for any additional citations.

Selection of studies: Two independent reviewers (SWK, TT) identified potentially relevant studies via abstracts and titles. Once identified, two reviewers (SWK, TT) independently reviewed the full text of the selected studies using pre-defined inclusion/exclusion criteria. Disagreements were resolved and discussed by third party adjudication (BHR) until a consensus was made.

RESULTS

Search results: The systematic and grey literature search identified 192 and 200 articles respectively (see Figure 1). Removing duplicates resulted in 168 citations overall. Twenty-seven articles were selected as potentially relevant and accessed for full-text review and the remaining 141 articles were excluded for various reasons. Twenty-five articles were excluded after full-text review, the primary reasons for exclusions being: the article was not an observational, interventional, or descriptive study (n=14), the studies did not include participants with traumatic or acquired brain injury (n=4), no homeless participants (n=1), or we were unable to retrieve the full text articles (n=4).

One abstract⁷ was marked as potentially eligible; however, the abstract did not provide any information on the study design, number of participants, or outcomes of those who participated in the program. The abstract identified a 13-person transitional living program for homeless persons with an ABI developed by the Statewide Head Injury Program (SHIP) as part of the Brain Injury and Statewide Specialized Community Services program in Massachusetts, USA (<http://www.mass.gov/eohhs/consumer/disability-services/services-by-type/head-injury/bisscs.html>). Moreover, neither the abstract nor program website provided any details on the 13-bed transitional housing program, so no information could be gathered on the type of intervention the participants were exposed to. No responses to our inquiries about the program have been received.

Study Characteristics: Overall, only one study, the Wicking Project,⁸ was included for analysis into the review. See Table 1 for characteristics of included study which are summarized below.

Design: The Wicking project was a non-blinded, randomized controlled clinical trial.

Patients: The study was set in Melbourne, Australia. Adult (aged 50 +) males living in Melbourne with mild dementia as a result of alcohol-induced brain injury (AIBI) were targeted for inclusion into the Wicking project.⁹ The participants were located with the assistance of homeless and community service providers. To be recruited in the study, participants had to have a history of homelessness or be at risk of being homeless, be ambulatory and active, and present with challenging behaviours, such as aggression, in addition to current addiction to alcohol. Patients would not be eligible to volunteer for the study if they were addicted to drugs, or had a mental illness that would prevent them from living in a shared, collaborative home environment. There was no guarantee that the participants would be able to remain residents of the household at the end of the trial, though searching for alternative housing would be attempted. A total of 14 elderly males participated in the study, seven placed in the interventional group housed under the Wicking model and seven placed in the control group.

Interventions: The Wicking model of residential care was developed to serve the complex needs of older people with ARBI. The seven Wicking model group participants lived in 4-bedroom community homes with 24/7 care support. Residents were encouraged to live as independently as possible with individualized programs, including recreational programs, and alcohol and cigarette management programs. Due to the nature of the project participants, specialized physicians provided medical support for health conditions that co-exist in alcoholic and homeless patients. Financial management was also available if needed. The seven

remaining participants in the control group continued to live in their original lifestyle without receiving any special interventions provided by the Wicking model mentioned above.

Outcomes: The data collected in this study consisted mainly of behavioral results. In the Wicking model participants, there were statistically significant reductions of anxiety (HADS, $F=9.083$, $p=.013$) and depression (HADS, $F=7.875$, $p=.019$) levels, as well as alcohol (63%) and cigarette consumption. A significant increase in productivity was also noticeable (CIQ, $F=8.030$, $p=.016$). The general health conditions (measured by the frequency of diagnosis) improved significantly in the Wicking model group, and were maintained at better conditions than the control group throughout the 18-month trial period. The quality of life (measured by the number of valued life roles obtained from the life role participation survey) also improved in the Wicking participants, whereas it remained unchanged or slightly deteriorated in the control participants.

The Wicking model was developed with the underlying belief that challenging behaviors in ARBI patients occur as a result of unmet needs. The study therefore recorded the frequency of challenging behaviors over the first 5 months. Specifically these behaviors included: verbal aggression, socially or sexually inappropriate behaviors, physical aggression towards objects or people, and problems maintaining ADLs. There were significant changes in the frequency of challenging behaviors over time among the Wicking model participants ($F=4.820$, $p=.008$); however, the details of the breakdown of behaviors were not given and no analysis of the control group was provided.

DISCUSSION

This review provides a comprehensive up-to-date synthesis of the literature in attempts to identify any interventional, observational, or descriptive studies examining outcomes and accessibility of non-institutionalized housing programs for homeless people with acquired brain injury. Despite an extensive search of multiple databases, only one study provided adequate information to be included in the review and only one other potentially relevant abstract was identified. The Wicking project,⁸ implemented in one city in Australia, involved older males with ARBI, and found that supportive non-institutionalized housing helped improve quality of life and reduced alcohol and tobacco consumption. More research is needed, however, to gain insights into the needs of homeless patients with ABI or TBI and the types of non-institutionalized housing programs for homeless people with brain injuries.

While only one study was identified in our literature search, it does provide some insight into the benefits provided by non-institutionalized housing programs for brain-injured homeless persons. The Wicking project⁸ placed homeless people with ARBI into a residential housing program, featuring several residents sharing a house that provided 24/7 care, in addition to intensive, individualized specialized care and behavioural management interventions. Levels of anxiety and depression were reduced, in addition to alcohol and cigarette consumption. The general health and quality of life improved as well for those housed in the Wicking project, compared to non-housed controls. In addition, cost-benefit analysis estimated a \$30 cost-to-government savings per day, with an estimated reduction in costs related to a reduction in police, ambulance, emergency department and hospital usage. The results of the Wicking project are similar to other research that found non-institutionalized

housing programs to homeless persons with mental illness.⁶ These programs have successfully provided long-term stable housing in addition to reducing usage of acute care services¹⁰ and improving cognitive functioning.^{5,11} Community services have also been developed to assist people with TBI maintain stable housing and cope with challenging behaviours.^{12,13} While not examined in the Wicking project⁸ it seems likely that behavioural management interventions may help to reduce challenging behaviours, such as aggressive behavior, that often limit the ability of homeless people with brain injury to keep and maintain stable housing.⁴

Limitations

There are several limitations of both the review and the single study identified. to discuss regarding the Wicking project.⁸ First, despite an extensive systematic search of the literature, with no restrictions in the year, language or status of publication, only one study could be included in the review. An additional abstract⁷ could not be included into the review due to a lack of information regarding the methodology of the study, or the housing program used. As a result, we were unable to formally assess the potential for publication bias. It is possible that some studies were completed but were never formally published in a scientific journal. Second, to address the possibility of study selection bias, at least two independent reviewers identified potentially relevant studies and the authors are confident that the studies that were excluded were done so for consistent and appropriate reasons. Finally, no pooled could be presented due to the presence of only one paper.

The included study also suffered from several weaknesses. First, the study authors did not specify the cause of brain injury in the participants, other than stating they were alcohol induced. It is unclear how many of the injuries were due to trauma relating to alcohol intoxication, versus alcohol induced neurodegenerative disorder, such as Korsakoff's syndrome. Second, the homeless status of the patients at the time of recruitment to the study was unclear, as the authors only stated patients either had a history of homelessness or were at risk of homelessness. The exact living conditions of the study participants (i.e., living on the streets or in a homeless shelter) were also unclear throughout the study for the control group. Third, the number of patients was small, with only 14 participants enrolled into the study. Fourth, the project only included elderly men and did not enroll any women, as the study authors also wanted to attenuate the risk of unwanted sexually inappropriate behaviours.⁹ As a result, the generalizability of the results may be limited. Finally, the study has a potential risk of bias due to the unclear method of randomization, in addition to the lack of double blinding of the outcome assessors. It is possible that this may have influenced the results of the study.

Conclusions

The current published literature is extremely limited with respect to establishing the evidence behind describing and implementing housing interventions for homeless patients with traumatic or non-traumatic brain injuries. While supportive non-institutionalized housing options for brain-injured elderly homeless people do show some promise, the evidence is limited to one study. Only one study was identified in the review, which found that placing

homeless people with alcohol related brain injury into a residential housing program with 24/7 specialized care helped improve the participants' quality of life and reduce alcohol and tobacco consumption. More research is urgently needed to examine whether access to non-institutionalized housing programs can allow homeless people with an ABI to obtain and maintain long-term housing solutions.

Acknowledgements:

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Appendix 1: Exact search strings

Table AI – Ovid MEDLINE®, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(®) Daily and Ovid MEDLINE(R) <1946 to Present>

	String terms
1	exp Brain Injuries/
2	brain injur*.mp.
3	((brain or head or cranial or cerebrocranial) adj2 (trauma* or contusion* or lacerat* or damage or injur* or lesion* or wound*)).mp.
4	housing.mp. or exp Housing/
5	1 or 2 or 3
6	(abi and brain).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keywordheading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]
7	(tbi and brain).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keywordheading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]
8	5 or 6 or 7
9	((housing or residence) adj2 (plan* or administ* or communit* or model or models or assist* or program* or programme* or broker* or development)).mp. [mp=title, abstract, original title, name of substance word, subject headingword, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]
10	exp Homeless Persons/ or exp "Transients and Migrants"/ or ((migrant or transient*) adj2 (people or person* or individual* or population* or worker* or men or women or man or woman)).mp. or (street adj2 (people or person* or individual* or population* or men or women or man or woman)).mp. or ("hard to house" or "lack of housing" or substandard housing or unstably housed or underhoused or under housed or squatter* or homeless* or vagrant* or indigent).mp. or (marginal* adj2 (population* or people* or group* or hous*)).mp.
11	8 and 9
12	8 and 10
13	11 or 12
14	13 not (rat or rats or animal*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]

Table All – Ovid Embase, <1974 to 2013 November 15>

	String terms
1	head injury/ or exp brain injury/
2	((head or brain or cranial or cerebrocranial) adj2 (damage or injur* or lesion* or trauma* or wound*)).mp.[mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
3	1 or 2
4	homelessness.mp. or exp homelessness/
5	((migrant or transient*) adj2 (people or person* or individual* or population* or worker* or men or women or man or woman)) or (street adj2 (people or person* or individual* or population* or men or women or man or woman)) or ("hard to house" or "lack of housing" or substandard housing or unstably housed or underhoused or under housed or squatter* or homeless* or vagabond* or vagrant* or indigent) or skid row dweller* or (marginalized adj2 (population* or people* or group*)) or marginal hous*).mp.
6	4 or 5

- 7 3 and 6
 8 (residential or residences or residence or home or hous* or shelter or abode).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
 9 7 and 8

Table AIII – Global Health

	String Terms
1	exp Brain Injuries/
2	brain injur*.mp.
3	((brain or head or cranial or cerebrocranial) adj2 (trauma* or contusion* or lacerat* or damage or injur* or lesion* or wound*)).mp.
4	housing.mp. or exp Housing/
5	(abi and brain).mp. [mp=abstract, title, original title, broad terms, heading words]
6	(tbi and brain).mp. [mp=abstract, title, original title, broad terms, heading words]
7	((housing or residence) adj2 (plan* or administ* or communit* or model or models or assist* or program* or programme* or broker* or development)).mp. [mp=abstract, title, original title, broad terms, heading words]
8	exp Homeless Persons/ or exp "Transients and Migrants"/ or ((migrant or transient*) adj2 (people or person* or individual* or population* or worker* or men or women or man or woman)).mp. or (street adj2 (people or person* or individual* or population* or men or women or man or woman)).mp. or ("hard to house" or "lack of housing" or substandard housing or unstably housed or underhoused or under housed or squatter* or homeless* or vagrant* or indigent).mp. or (marginal* adj2 (population* or people* or group* or hous*)).mp.
9	1 or 2 or 3 or 5 or 6
10	9 and 7
11	9 and 8
12	10 or 11
13	4 and 12

Table AIV - CINAHL Plus

	String terms
1	(MH "Brain Injuries+") OR (MH "Head Injuries+")
2	((brain or head or cranial or cerebrocranial) N2 (trauma* or contusion* or lacerat* or damage or injur* or lesion* or wound*))
3	("hard to house" or lack of housing" or substandard housing or unstably housed or underhoused or under housed or squatter* or homeless* or vagrant* or indigent).
4	(MH "homelessness") or "homeless"
5	(street) n2 (person or people or man or woman)
6	((housing or residence) N2 (plan* or adminst* or communit* or model or models or assist* or program*
7	S1 OR S2
8	S3 OR S4 OR S5
9	S6 AND S7 AND S8
10	S6 AND S7
11	S7 AND S8
12	S10 OR S11
13	(S10 OR S11) NOT (rat or rats or animal*)

Table AV – PsycINFO <1806 to November Week 2 2013>

String Terms	
1	((brain or head or cranial or cerebrocranial) adj2 (trauma* or contusion* or lacerat* or damage or injur* or lesion* or wound*)).mp.
2	exp Traumatic Brain Injury/ or exp Brain Damage/
3	exp Homeless/ or homeless*.mp.
4	("hard to house" or "lack of housing" or substandard housing or unstably housed or underhoused or under housed or squatter* or homeless* or vagrant* or indigent).mp.
5	(Street adj2 (person or people or man or woman)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
6	"skid row".mp.
7	1 or 2
8	3 or 4 or 5 or 6
9	7 and 8
10	((housing or residence) adj2 (plan* or administ* or communit* or model or models or assist* or program* or programme* or broker* or development)) or re-housing).mp.
11	9 and 10
12	7 and 10
13	9 or 12

Box A1 – Other search strings

String terms

SCOPUS

(TITLE-ABS-KEY (residential OR residences OR residence OR home or hous* OR shelter OR adobe)) AND ((TITLE-ABS-KEY ("hard to house" OR "lack of housing" OR homeless* or "substandard housing" OR "unstably housed" OR underhoused OR "under housed" OR squatter* OR homeless* OR vagrant* OR indigent OR "street people" OR "street person" OR "skid row" OR transient* OR migran*)) AND (TITLE-ABS-KEY (((brain OR head OR cranial OR cerebrocranial) W/2 (trauma* OR contusion* OR lacerate* OR damage OR injury* OR lesion* OR wound*))))))

LILACS

Brain Injuries [Subject descriptor] and housing [Words] and homeless [Words]

Sociological Abstracts

(su(homelessness) OR su (homeless people)) AND (brain injury* OR brain damage* OR (housing) AND (brain injury* OR brain damage*))

Proquest Dissertations and Theses

all ((brain OR head OR cranial OR cerebrocranial) NEAR/2 (trauma* OR contusion* OR lacerate* OR damage OR injury* OR lesion* OR wound*)) AND all(("hard to house" or "lack of housing" or "substandard housing" or "unstably housed" or underhoused or "under housed" or squatter* or homeless* or vagrant* or indigent OR street people or street person or skid row or transient* or migrant*) and (home or housing or residential or residence or residences) and not (rat or rats or animals))

Figure 1. Systematic literature search overview.

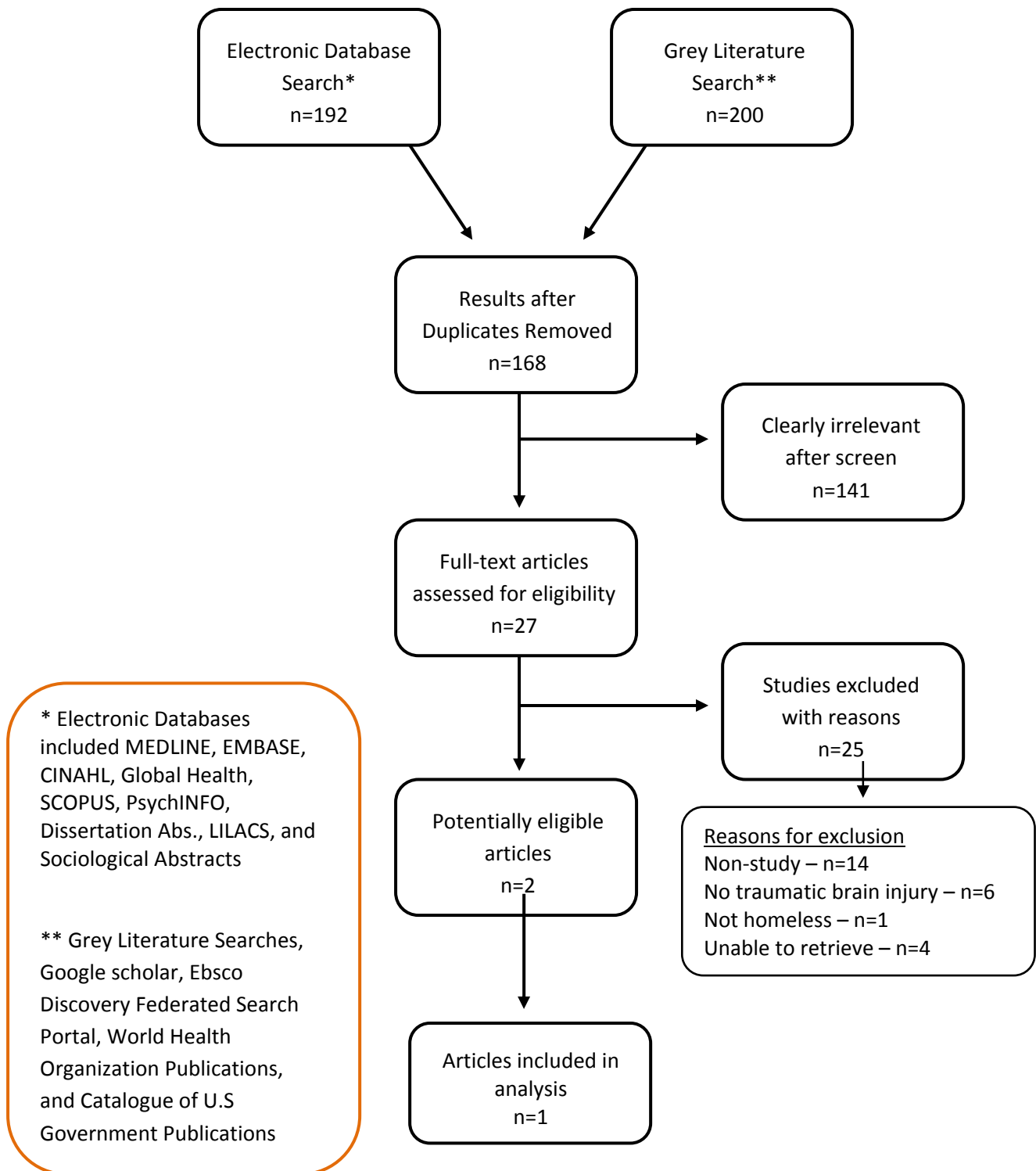


Figure 1. Prisma flow diagram delineating search, screening and eligibility assessment results for the comparative effectiveness systematic review of non-institutionalized housing programs for homeless population with acquired brain injury.

Table 1. Study Characteristics

Reference	Rota-Bartelink 2011
Location	Melbourne, Australia
No. of Subjects	14
Design	Non-blinded randomized controlled study: 18-month trial (method of randomization not described)
Participants	<ul style="list-style-type: none"> • Voluntary males \geq 50 years old • Homeless or at risk of homeless • Diagnosed or suspected of alcohol-related brain injury • Histories of challenging or aggressive behaviors, but no mental disorders concerning living in community housing • No addiction to drugs other than alcohol or cigarettes
Interventions	<p>Wicking model group</p> <ul style="list-style-type: none"> • 4-bedroom community home • 24-hour personalized care and behavior management • Individualized recreational programs • Individualized alcohol and cigarette management • Financial management (as needed) <p>Control group</p> <ul style="list-style-type: none"> • Pursued normal lifestyle without any interventions
Outcomes	<p>Wicking model group (vs. Control group)</p> <ul style="list-style-type: none"> • Reductions in anxiety and depression levels • Reductions in alcohol and cigarette consumption amount • Increase in productivity levels • Improvement in general health conditions (measured by frequency of diagnosis) • Improvement in quality of life (measured by valued life roles) <p>Control group</p> <ul style="list-style-type: none"> • Unchanged or slight deterioration in quality of life
Notes	<p>Link to Wicking project website: http://www.wintringham.org.au/Research/TheWickingProject.aspx</p>