

Title: The effectiveness of increased physical activity in improving the mental health of patients admitted on an acute mental health hospital ward: A systematic review

Abstract: Treating depression is often linked to the usage of pharmacological interventions, and often non-pharmacological interventions, such as exercise, is overlooked as a significant intervention to prevent the development of comorbidities associated with the mental health condition. Changes in the approach on how depression is treated allowed for non-pharmacological interventions to surface as a priority area to be understood by health professionals. However, the current research is composed of small sample sizes that examine the effects of physical activity for an extended period, resulting in significant dropout rates. Thus, even though increased physical activity has positive effects on the mental health of patients admitted to hospital under an acute mental health ward, there is still a need for more research to evaluate the effects of physical activity in shorter and applicable terms.

Rationale: Clinical practice has shown that an increased level of physical activity for mental health patients admitted under an acute mental health hospital ward can improve their mental health. However, these interventions are generally seen as part of standard practice. Therefore, there is a need to evaluate the literature to examine the effectiveness of increased physical activity and the correlation in improving patients' mental health under a mental health ward.

Objective: To conduct a systematic review on current health literature to evaluate the effects of increased physical activity in improving the mental health of patients admitted on an acute mental health hospital ward: a systematic review

Keywords: physical activity, adult mental health, mental health inpatient, hospital, review

Introduction: The treatment of depression is often linked to the usage of antidepressants, and often non-pharmacological interventions, such as exercise, are overlooked as a significant intervention to prevent the debilitating effects of the mental health condition (McIntosh, Hunter, & Royce, 2016; Morgan, Olagunju, Corrigan, & Baune, 2018; Stubbs, Vancampfort, Rosenbaum, Ward et al., 2016b). The change of the treatment paradigm of depression towards a more holistic approach has resulted in increased awareness of the linkage of physical activity and mood (Morres et al., 2019; Stubbs, Vancampfort, Rosenbaum, Ward et al., 2016a). A thesis established that patients admitted under a mental health ward could often develop sedentary behaviour due to the hospital environment (Fraser, 2016). The previous combined with the symptomatology of depression can be debilitating for the

individual. Increasing physical activity has always been speculated to improve the mental health of patients. However, the availability of research literature on this area is developing, and undertaking a systematic review would assist in translating the current literature to current practice and recommend the future research that needs to undertake on this topic area.

Methods

Eligibility criteria

The gathered literature will be screened against the is following criteria. First, the literature must include an evaluation of the effects of increasing physical activity in improving the mental health of adult mental health patients admitted under an acute mental health hospital ward. Additionally, the criteria considered was that the literature needed to be peer-reviewed and published over the last five years.

Information sources

Several sources of information were consulted to obtain the necessary literature to conduct the systematic review. The following health literature databases were accessed: CINAHL, Ovid Medline, ClinicalKey for Nursing and PubMed. Additionally, reports from the Australian website Trove and the national library of Australia were accessed to obtain reports that could be used supporting literature for the systematic review.

Search strategy

The search strategy for the systematic review yielded successful data saturation. Boolean terms were used to create results that could be more applicable for the systematic review. The keywords were utilised in conjunction with the database search strategy, yielding studies a wide range of records for the systematic review. On the other hand, the keywords were utilised with the additional Boolean for "Thesis." The search resulted in two hundred and thirty-one results.

Selection process

The search through the databases and registers yielded successful results. The author initially reviewed the results, and the abstract and results were examined to ascertain the applicability of the study towards the systematic review. If the study satisfied the eligibility criteria at first, the literature would be pooled for further examination.

Data process

The data was then extracted from the articles utilising the critical appraisal skills programme tool from the University of Oxford (Critical Appraisal Skills Programme, 2018) to estimate the level of trustfulness and rigour of the selected studies.

Data Items

Some data items are essential for the review. The following data will be extracted: patient population on the study, length of the study, type of intervention implemented and outcome of the intervention concerning mental health.

Study risk of bias assessment

The data will be gathered using the University of Oxford guidelines (Critical Appraisal Skills Programme, 2018) and other guidelines set out by PRISMA (Page et al., 2021), preventing the contribution of selection, information confounding bias. However, only one author is present on this review which, despite the previous strategies implemented before, there should be an acknowledgement that some bias might result because of this.

Effect measures

The data gathered from the data items will be examined and then compared to evaluate the effects of increased physical activity and mental health with mental health patients admitted to the hospital acute mental health setting.

Synthesis method

The synthesis method will be composed of elaborating the effects of the previous data items. The CAPS tools set out by the University of Oxford will be utilised as the structure to synthesise the data in

Reporting bias assessment

Bias will be prevented by following the structure of the PRIMA guidelines (Page et al., 2021). Additionally, the data will be reported utilising evidence-based tools from the University of Oxford (Critical Appraisal Skills Programme, 2018). Finally, assistance from university academics will be utilised to assist in the production of this systematic review and assist with the reduction of subjective bias and increased level of objectivity.

Certainty assessment

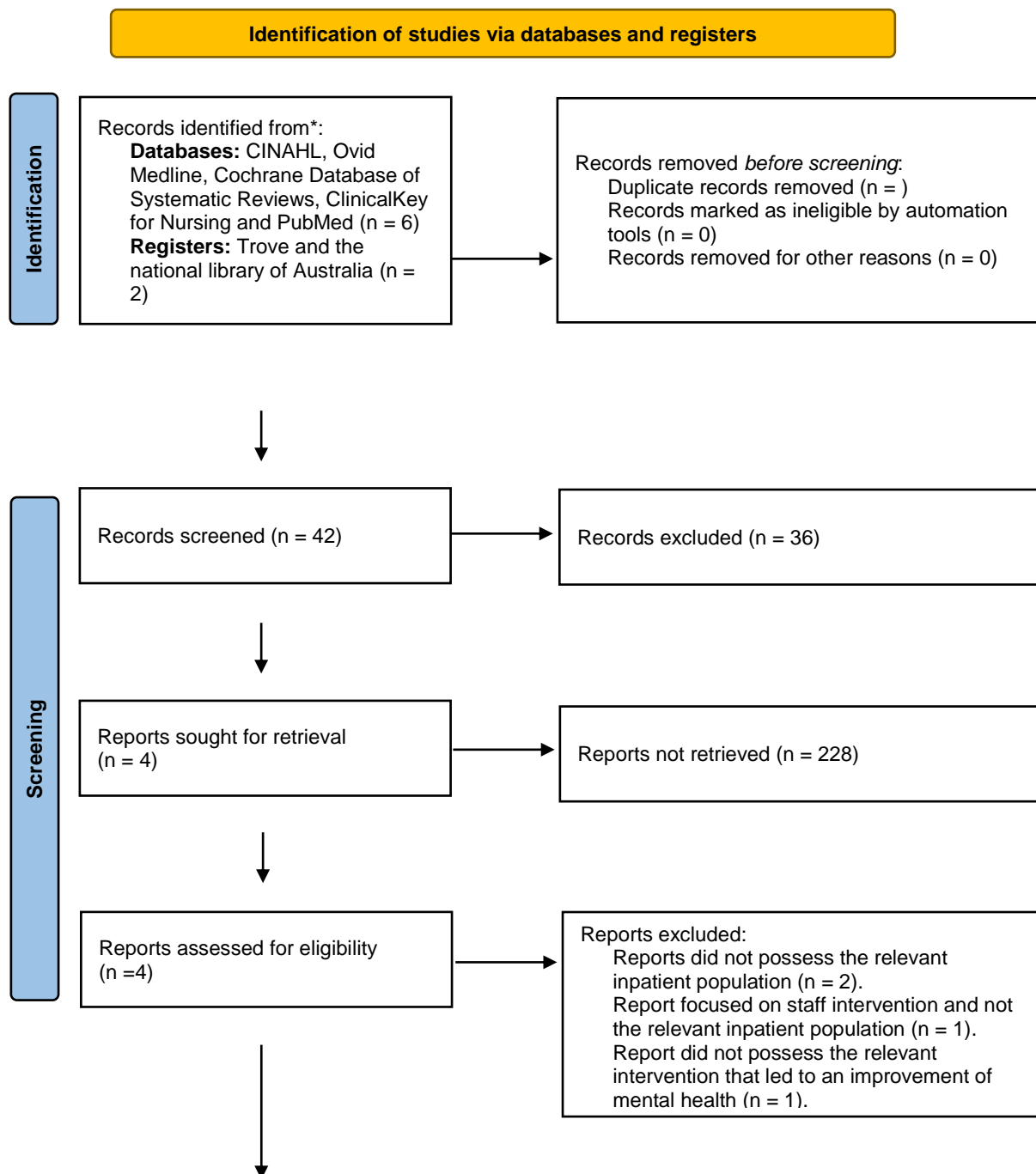
Interventions identified previously to increase the level of physical activity resulting in the improved mental health of patients admitted to hospital under a mental health ward will

be evaluated in their transferability to current practice. An initial assessment of the application to practice and the necessary changes that need to occur for the previous interventions to be successful in the hospital setting will be undertaken. Barriers will also be identified in this section.

Results

Study Selection

The following flow diagram from PRISMA elaborates the rationale for selecting the relevant studies for the systematic review (Page et al., 2021).



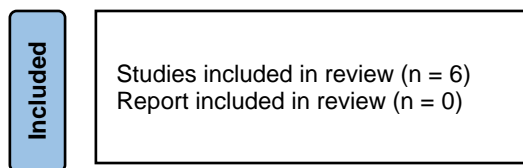


Figure 1: Preferred reporting items for systematic reviews with the reports flow diagram

Forty-two studies were successfully screened against the selection criteria, and six were concluded to be included in the review. Initial examination of the forty-two studies led to eliminating most of them due to the following characteristics. Some studies were focused on the community mental health setting and not on the desired inpatient setting (Alexander & Cooper, 2015; Liss, Uchida, Wilkes, Radakrishnan, & Linder, 2021). Additionally, some studies on the selection pool had participants who were not congruent to the selection criteria (Alexander & Cooper, 2015; Cunningham, O' Sullivan, Caserotti, & Tully, 2020; Jin & Ying-Yu Chao, 2018; Korczak, Madigan, & Colasanto, 2017). Some studies did not meet the selection criteria as the desired condition of examination was the improvement of mental health (Morgan et al., 2018; Shrestha, Ng, & Gray, 2021; Vancampfor et al., 2015). One piece of literature was suitable with the selection criteria and the study, but this piece of literature could not be retrieved from the databases (Moxley, 2019). The remainder of the studies not included in this selection did not meet the selection criteria in combination for more than one characteristic. The final screen resulted in six being considered for inclusion in the review.

The register search yielded two hundred and thirty-two reports; upon initial examination against the selection criteria, the author pooled four reports to be retrieved from the register. Following the retrieval of the four reports, further screening concluded that two reports did not possess the relevant patient population (Rhiannon Lee White, 2016; Susan Hunt, 2017). Another report only focused on staff intervention and not relevant inpatient population (Hamish Fibbins, 2021). Additionally, another report did not possess the relevant intervention that led to improved mental health (Fraser, 2016). Therefore, all the reports were excluded from being implemented in the review. However, some aspects from the excluded literature will be utilised to support the discussion.

Study Characteristics and results of individual studies

Literature	Type of study	Population/studies examined	Interventions	Results
Morres et al. (2019)	Systematic review	Eleven studies including 455 adult patients with median age ranging from 20.9 to 49.1. Each study possessed a patient population from European and Caucasian countries—hospital and community settings. Studies were from 1985 to 2015.	The majority of studies possessed a mean of 45 minutes of aerobic exercise with patients for a mean of nearly five months of ongoing intervention.	Moderate improvement in mental health.
Stubbs et al. (2016b)	Systematic review and meta-analysis	Forty-four studies included 1122 adult patients with major depressive disorder with mean age of 49.8 years, 63% were females, and 38.1% were antidepressant use. No cultural background is established. Studies examined were from 1989 to 2015.	6 of the 44 studies only implemented exercise in addition to the treatment as usual (psychotherapy and psychopharmacology) for a mean of 5 months of ongoing intervention.	Marked improvement in depressive symptoms.
Gómez-Gómez et al., (2020)	Systematic review and meta-analysis.	Twenty-three studies including 7758 patients with mean depressive patients of 46.55% and a mean age of 52.5. A multitude of countries around the world. Hospital and community setting. Studies ranging from 1999 to 2019.	All studies implemented exercise as their intervention and only ten measured depressions as the primary outcome. Mean of 26 months of ongoing intervention.	No reduction in depressive symptoms.
Kvam, Kleppe, Nordhus, & Hovland	Meta-analysis	Twenty-three studies including 1494 patients with major depressive disorder. The mean age	All studies implemented exercise as their intervention for a mean of 7 months of ongoing	Moderate improvement in mental health.

(2016)		of 52.2 and from both sexes. A multitude of countries around the world. Studies ranging from 1985 to 2014. Unknown setting.	intervention.	
Ashdown-Franks et al. (2020)	Meta-analysis	Eight metanalyses with patients with major depressive disorder. Unknown background and setting.	Exercise to improve mood.	Improvement in mental health for the younger and older population. Otherwise, when implemented as an add-on to treatment can have some impact on mental health.
Hu et al. (2020)	Systematic review	3 of 8 studies included 196 adult patients with depressive symptoms. Unknown background and setting.	Exercise as an intervention for a mean of 7 months of ongoing intervention.	Exercise has been shown to decrease depressive symptoms and improving mental health.

Risk of bias in studies

All the studies examined the potential risk of bias. Four studies identified a very low risk of bias (Gómez-Gómez et al., 2020; Hu et al., 2020; Morres et al., 2019; Stubbs et al., 2016b). However, other studies highlighted that they could possess a higher degree of bias from the literature examined (Ashdown-Franks et al., 2020; Kvam et al., 2016). In addition, due to the utilisation of randomised control studies in the previous six highlighted evidence, they all utilised the Cochrane tool to identify the risk of bias (Ashdown-Franks et al., 2020; Gómez-Gómez et al., 2020; Hu et al., 2020; Kvam et al., 2016; Morres et al., 2019; Stubbs et al., 2016b).

Result of synthesis

The following section will examine the trustworthiness and rigour of the chosen literature by utilising the CASP tool by the University of Oxford (Critical Appraisal Skills Programme, 2018). All the literature was able to respond to the research question, and the author has examined the necessary number of papers required for the systematic reviews. The relevance of studies was examined and considered in the research paper. The authors of the literature were able to establish the quality of the included studies. The results were clear and congruent with the research question, and they were mainly supporting the initial thesis. Due to the higher level of evidence produced, the studies could produce precise results that were congruent with minimal bias (Morres et al., 2019).

Reporting biases

Stubbs et al. (2016b) highlighted a high dropout rate on their sample size and established that only six of forty-four included studies had an exercise intervention. Additionally, bias was identified due to the high dropout rate in the sample size in some of the randomised control trials examined (Ashdown-Franks et al., 2020; Kvam et al., 2016). However, on further evaluation of the discussion, it was further explored that bias was not present in the literature examined due to the low degree of bias identified and the conduct of meta-regression analysis (Ashdown-Franks et al., 2020; Gómez-Gómez et al., 2020; Stubbs et al., 2016b).

Certainty of evidence

The quality of evidence evaluated appears to be appropriate to evaluate for the research question in how effective the increased physical activity of adult mental health patients is admitted to hospital under an acute mental health ward. The evaluation previously examines a small risk of bias and no significant bias identified during the review that would link to publication and information bias. However, the transferability of the before current practice might be challenging. Often patients admitted to the acute mental health ward do not stay on the facility for longer than a mean ten days. Therefore applying appropriate interventions as set out by the previous literature will undoubtedly be challenging. Furthermore, there could be a consideration to brief interventional strategies to be implemented in current practice that could be not time-consuming—for instance, thirty-minute exercise sessions with a group of patients.

Discussion

The prevalence of depressive disorders across the globe is a cause of public health concern and has been identified by health organisations as possessing a high burden of

disease (Gómez-Gómez et al., 2020; Morres et al., 2019; Stubbs et al., 2016b). The effectiveness of the pharmacological interventions only reduces the symptomatology a small amount (Gómez-Gómez et al., 2020). Changes in the treatment paradigm have allowed for the increased awareness of physical activity and the effect of the mental health affected with depression. Current health practice has reflected on the previous, as the treatment of depression has changed to undertake a more holistic approach.

The evidence of physical activity and mental health has been present in the health literature. However, the effects of physical health activity concerning depression is yet to be fully understood. The health literature examined in this systematic review has evaluated that mental health can benefit from increased physical activity (Hu et al., 2020; Kvam et al., 2016; Morres et al., 2019; Stubbs et al., 2016b).

The interventions set out by the previous literature to increase physical activity by instructing patients in a group setting to increase physical activity can be potentially transferable into current practice. The studies examined extended periods of interventions ranging from one month to one year (Ashdown-Franks et al., 2020; Gómez-Gómez et al., 2020; Hu et al., 2020; Kvam et al., 2016; Morres et al., 2019; Stubbs et al., 2016b). However, the feasibility of applying these interventions in current practice can be challenging as patients admitted under a mental health ward stay a mean of ten days. Therefore, consistent exercise groups involving patients and trained healthcare staff for thirty minutes could be more applicable for practice.

A thesis evaluated that mental health patients admitted in the acute setting are generally interested in improving their physical health (Fraser, 2016). However, the ongoing studies on this population turned out to have a high dropout rate, which is hypothesised for the high commitment required. A way to address this in practice is to create regular exercise groups that are not commitment based that any mental health patient can drop in and out at any time.

Barriers could arise as the new practice is implemented in the workplace. Workplace culture can play a factor when implementing change. Therefore the staff need to be supported to transition to this new role.

There is a lack of research directed to the effects of physical activity in improving the mental health of adult patients admitted to hospitals under an acute mental health ward. The majority of the research directed to this area had a small sample size, and some of these studies had a considerable dropout of participants (Kvam et al., 2016; Morres et al., 2019). However, the results promoted the initial thesis that patients that undertake physical activity have improved mental health. Therefore, more research in the acute mental health setting in

smaller samples and studies should undertake to understand the effects of increased physical activity on mental health.

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