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Additional weekend allied health services reduce length of stay in subacute rehabilitation wards but their effectiveness and cost-effectiveness are unclear in acute general medical and surgical hospital wards: a systematic review

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KEY WORDS

Systematic review
Meta-analysis
Allied health
Physical therapy
Weekend

ABSTRACT

Question: Are additional weekend allied health services effective and cost-effective for acute general medical and surgical wards, and subacute rehabilitation hospital wards? **Design**: Systematic review and meta-analysis of studies published between January 2000 and May 2017. Two reviewers independently screened studies for inclusion, extracted data, and assessed methodological quality. Meta-analyses were conducted for relative measures of effect estimates. **Participants**: Patients admitted to acute general medical and surgical wards, and subacute rehabilitation wards. **Intervention**: All services delivered by allied health professionals during weekends (Saturday and/or Sunday). This study limited allied health professions to: occupational therapy, physiotherapy, social work, speech pathology, dietetics, art therapy, chiropractic, exercise physiology, music therapy, oral health (not dentistry), osteopathy, podiatry, psychology, and allied health assistants. **Outcome measures**: Hospital length of stay, hospital re-admission, adverse events, discharge destination, functional independence, health-related quality of life, and cost of hospital care. **Results**: Nineteen articles (20 studies) were identified, comprising 10 randomised and 10 non-randomised trials. Physiotherapy was the most commonly investigated profession. A meta-analysis of randomised, controlled trials showed that providing additional weekend allied health services in subacute rehabilitation wards reduced hospital length of stay by 2.35 days (95% CI 0.45 to 4.24, $I^2 = 0\%$), and may be a cost-effective way to improve function (SMD 0.09, 95% CI –0.01 to 0.19, $I^2 = 0\%$), and health-related quality of life (SMD 0.10, 95% CI –0.01 to 0.20, $I^2 = 0\%$). For acute general medical and surgical hospital wards, it was unclear whether the weekend allied health service model provided in the two identified randomised trials led to significant changes in measured outcomes. **Conclusion**: The benefit of providing additional allied health services is clearer in subacute rehabilitation settings than for acute general medical and surgical wards in hospitals. **Registration**: PROSPERO CRD76771. **[Sarkies MN, White J, Henderson K, Haas R, Bowles J, Evidence Translation in Allied Health (EviTAH) Group (2018) Additional weekend allied health services reduce length of stay in subacute rehabilitation wards but their effectiveness and cost-effectiveness are unclear in acute general medical and surgical hospital wards: a systematic review. *Journal of Physiotherapy* XX: XX–XX]**

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Background

Allied health services, medicine and nursing are considered to comprise three pillars of the healthcare system.[1] Allied health professionals provide diagnostic and therapeutic services across different settings,[2] and represent a large proportion of the healthcare workforce internationally.[3,4] Allied health is often organised and managed in professional groups, including physiotherapy, psychology, occupational therapy, speech pathology, dietetics, podiatry, and social work, within an over-riding inter-professional comprehensive care model.[5,6]

The routine provision of weekend allied health services is variable across hospitals both in Australia and worldwide. For example, a survey of tertiary care hospitals in Canada reported that

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97% of facilities provided routine weekend physiotherapy services, with diversity in the amount and focus of service delivery.[7] In Australia, 61% of hospitals routinely provided physiotherapy on Saturdays, and 45% on Sundays, with more provided in metropolitan and acute hospitals than regional and subacute hospitals.[8] Aside from physiotherapy, comparatively little is known about the practices of other allied health professions. The evidence about the effects of providing these services during weekends is unclear. Providing earlier,[9,10] additional,[11–13] or higher intensity[14] allied health services can improve health outcomes. However, it is unclear whether these benefits occur when weekend allied health staffing models are used to deliver additional services on a routine basis.[15] The provision of allied health services on weekends incurs more cost and logistical difficulty than during traditional business hours, with uncertainty around the experience of staff, appropriateness of referrals, and whether the mix of professions achieves the intended benefits.[16]

The aim of this review was to synthesise the available evidence examining the effectiveness and cost-effectiveness of providing additional weekend allied health services to patients on acute general medical and surgical hospital wards, and subacute rehabilitation hospital wards.

Therefore, the research question for this systematic review was:

> Are additional weekend allied health services effective and cost-effective for acute general medical and surgical wards, and subacute rehabilitation hospital wards?

Box 1. Inclusion criteria.

Design
- Randomised, controlled trials
- Non-randomised, controlled trials
- Observational studies

Participants
- In-patients on a general medical or surgical wards or a subacute rehabilitation ward of a hospital

Intervention
- Additional allied health service delivered at the weekend

Outcome measures
- Hospital length of stay
- Hospital re-admission
- Adverse events
- Discharge destination
- Functional independence
- Health-related quality of life
- Cost of hospital care

Comparisons
- Additional allied health services versus usual allied health services only

Methods

This systematic review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines.[17]

Identification and selection of studies

Ovid MEDLINE (all fields), PubMed (all fields), CINAHL (keyword, title, CINAHL subject headings, abstract, and instrumentation fields), Cochrane library (title, abstract, keywords), and Scopus (title, abstract, keywords) were searched for articles published between 1 January 2000 to 5 May 2017 to retrieve contemporary literature. Terms relevant to the population and intervention were combined and results were limited to English-language publications. See Appendix 1 on the eAddenda for the full search strategy. Electronic database searches were supplemented by cross-checking the reference list of included articles and relevant systematic reviews identified during the screening process. Publication lists from key authors in the field were also hand searched to identify additional studies. A web-based application[a] was used for reference management.[18]

The inclusion criteria for the review are presented in Box 1. For the purposes of this review, acute general medical and surgical wards included: general medical, general surgical, medical assessment unit, orthopaedic, vascular, plastics, ear nose and throat, thoracic, respiratory, coronary care unit, renal, rheumatology, neurology (including stroke units), infectious diseases, colorectal, endocrine, urological, and gastroenterology. Excluded acute wards were emergency department, intensive care unit, high dependency unit, burns, spinal, maternity, paediatrics, mental health, and palliative care. These wards were excluded because the allied health role was considered to be potentially different in these settings compared to acute general medical and surgical wards. For the purposes of this study, subacute rehabilitation wards included inpatient rehabilitation (both mixed and condition-specific wards), and geriatric evaluation and management wards. Excluded subacute wards comprised mental health and psychiatric, chronic and long-term care, alternative level of care, and extended care patients. The goals of care on these wards were considered to be different to those on inpatient rehabilitation and geriatric evaluation and management wards.

Interventions focused upon in this review included all services delivered by allied health professionals during weekends (Saturday and/or Sunday). This study limited allied health professions to: occupational therapy, physiotherapy, social work, speech pathology, dietetics, art therapy, chiropractic, exercise physiology, music therapy, oral health (not dentistry), osteopathy, podiatry, psychology, and allied health assistants.[19] An allied health service not delivered by an allied health professional or allied health assistant (eg, nursing staff or self-directed) was not eligible. Weekends were defined as complementary to the traditional workweek, as per the country the study was performed in. Studies that reported data relating to the provision of additional allied health services as part of changing timing of commencement, intensity, frequency or duration with a weekend component were included, but only if data relating specifically to weekend services with appropriate controls could be extracted.

Two reviewers (MS and JW) screened titles and abstracts independently against the above criteria. Studies determined to be potentially eligible were retrieved for full-text review. Two reviewers (MS and JW) independently assessed the full-text articles to ascertain eligibility for inclusion. Where there was any disagreement during the screening, a third independent reviewer (KH) was consulted. Authors of studies whose full-text article could not be retrieved were contacted. In the cases of non-response, these articles were excluded.

Assessment of characteristics of studies

Data were extracted using a customised pro-forma, which was developed and piloted for this review. One (JW) and either of two other reviewers (KH or JB) independently extracted data relating to the study details, design, setting, population, intervention, outcomes, and results for all included studies. Discrepancies in extracted data were resolved by discussion. Where agreement could not be reached, a fourth independent reviewer (MS) was consulted.

Quality

Two of three reviewers (JW, KH or JB) independently assessed the risk of bias for randomised, controlled trials using the Cochrane Collaboration's tool for assessing risk of bias,[20] and the Newcastle-Ottawa Quality Assessment Scale for observational studies.[21] Any discrepancy in the assessments of risk of bias was resolved by

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