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Hospital Avoidance – Systematic Review

This briefing was prepared as part of a primary health care research collaboration between Griffith University and General Practice Queensland.

Background

This briefing is summary of the key findings, which emerged out of the systematic review of published papers that identify significant predictors of hospitalization. The study aimed to identify the key modifiable determinants of avoidable hospitalization in chronic disease to inform the development a coherent framework from which to interpret findings and for consideration in the development of preventative approaches to disease management and understanding processes associated with chronic disease management (see briefing 8). The full article (in journal publication review) can be found at www.gpqld.com.au/Programs/Collaborative_Research_Hub

Avoidable admissions are defined as admissions that might ordinarily have been controlled or avoided.¹ In Australia it is estimated that the number of avoidable admissions in a calendar year is approximately more than half a million admissions.² A disproportionate number of avoidable hospital admissions occur in relation to chronic conditions, usually due to an acute exacerbation of one or more symptoms and often as a result of the absence of preventative measures or timely access to primary health care services.^{2,3,4}

Systematic Review and Findings

The systematic review methodology and process for identifying the key research findings which influence predictors of hospitalization can be found in the full paper. The findings includes a summary of predictive factors which influence hospitalization outlined below.

Summary of Predictive Factors

31 unique factors were identified as determinants of avoidable hospitalization. These were grouped into three categories according to the individual, health service system and environmental factors.

Individual Factors

Age

Age was the most frequent predictor for hospitalisation, particularly those older than 65 years. A U-shaped distribution finding was also identified with both older (>64 years) and younger patients (<19 years) who were at higher risk of avoidable hospitalization, particularly those who lived in urban areas, were of low socio-economic status, have access to Medicaid and who have 'tertiary' education.¹

Gender

Findings within studies vary considerably and highlight that the risk of hospitalization with regard to age is dependent on age related to the specific chronic disease. The implications for practice and communities addressing hospitalization suggests that investigation into the major chronic illness impacting on hospitalization, needs to include reviewing disease specific approaches impacting at the local level.

Socioeconomic Status

Socioeconomic status (including the combined effect of education and income) was found to be a strong predictor of hospitalization in nearly half of the studies selected (n=23, 39%). Social disadvantage, defined by Census Collection District Index of Relative Disadvantage, which included qualifications, income, unemployment, type of job, home ownership, single parent families, marital status, car ownership, school leaving age, Aboriginal and Torres Strait Islander descent, number of families per household and English proficiency according to Brameld et al. (2006)⁵ confirmed that individuals with low levels of socio-economic status incurred more hospital admissions for avoidable conditions.

Race and Ethnicity

Race and ethnicity contributed to predicting avoidable hospitalization in almost one quarter of the studies (n=18, 23%). Variables impacting on the predicted use of hospital resources were difficult to distinguish between ethnic or racial origin and lower socioeconomic status, access to services, and the variation in cultural origins and how different ethnic groups behave and respond in different ways.^{6,7}

Social Support

A limited number of studies (n=4, 5%) reported on the important role of social support in avoidable hospitalization. Risk factors associated with social support include people with limited social contact causing social isolation, marital status, whether they lived at home alone and family contact whilst takes may forms with the broader definition of social support, were found to impact on hospital admission rates.

Living Arrangements

A small number of studies reported on the association between living arrangements and hospitalization (n=6, 7%). Household crowding was related to hospitalization,⁸ however the overall results were conflicting and the conclusion indicated that living arrangements were not significantly related to hospitalization risk for chronic conditions.

Biomedical Markers and Treatment

Bio-medical markers were frequent and significant predictors of hospitalization for chronic disease (n=24, 30%). These factors were usually condition specific, and most often included FEV (Forced Expiratory Volume), dyspnea, hypertension, body mass index, and blood pressure (systolic). Other clinical indicators were identified as predictors of hospitalization (eg chronic mucus hyper-secretion, airflow obstruction, nephropathy) and treatment and therapy indicators (eg. Insulin treatments, home oxygen therapy, steroid treatment) were also identified as predictors of hospitalization for chronic disease.

Medication

Five studies (6%) identified medication use associated with hospitalization for avoidable conditions. Medication use was found to be associated with the complexity of the illness and the treatment of co-morbid conditions,⁹ along with non-compliance with medication.¹⁰

Health Status

Multiple studies (n=27, 33%) identified the important role of health status (including physical and mental health) and health quality of life in the prevention of hospitalization. In fact, current health status (incorporating physical and mental health) was the second most frequent indicator of hospitalization reported. The overall research findings suggest that the consequences of a chronic condition for a person's life may be more important than the actual condition in predicting hospitalization.

The complexity of mental health issues was identified as a predictor for hospitalization and one researcher reporting that depressed people from rural communities were three times more likely to be admitted for physical problems due to their rurality.¹¹

Co-Morbidity

Co-morbidity was consistently associated with avoidable hospitalization, with the risk of hospitalization increasing alarmingly for every additional co-morbid chronic condition. The severity of the chronic condition is also associated with the risk of hospitalization, which highlights that both the complexity of an individual's condition in relation to their disease profile and the severity impact on risk associated with hospitalization.

Health Service System Factors

Prior Hospitalization

Prior hospitalization for the same condition was found to be a significant predictor of hospitalization among people with chronic disease. Prior hospitalization was usually measured as any admissions to hospital within the last 12 months, and did not necessarily include emergency department visits, although this was also a significant predictor outcome in all studies reporting this factor (n=5). Providing primary care sector strategies to support care in the community (eg Asthma Action Plan, problem-focused coping strategies) were associated with reduced hospitalization rates.¹²

Availability of Health Services

Availability of health services was related to hospitalization and included physician availability as well as hospital bed availability. Findings confirmed that in areas where there are fewer General Practitioners per capita, this impacted on people being forced to seek treatment as an inpatient, noting that such treatment could have been offered in the community.³

Integrated Services and Coordinated Care

The coordination or integration of primary care services emerged as a consistent predictor of hospitalization in the chronic disease population. The findings support the delivery of an integrated care intervention with enhanced self-management and increased access to the health care professional, helping to control symptom management and early identification in reduced episodes requiring hospitalization.¹³ A multidisciplinary approach in providing community care and implementing a managed care program was associated with reduction in hospital admissions.¹⁴

Physician Characteristics

The findings suggest that practitioners use both clinical and social information (eg socio-demographic concerns for patients, insufficient financial or self-care resources) to guide their decisions about hospital admission. Practitioners who practice in more socially disadvantaged areas, where there is a higher proportion of revenue, which comes from the government-sponsored (USA) Medicaid program¹⁵ may impact on the greater likelihood of hospitalization due to the lower rate of reimbursement for services. This potentially impacts on resources, which could be directed toward supporting the care process through education or self management to help prevent hospitalization.¹⁵

Self Management Supports

The impact of self-management on avoidable hospitalization was reported in a small number of studies (n=7, 9%). Similar to continuity of care, findings across almost all studies reported that an increased focus on self-management for patients resulted in less likelihood of avoidable hospital admission. Although hospitalization is not often used as an outcome indicator of self-management education, there are findings that disease-specific education can improve specific clinical indicators (eg. in diabetes, COPD and asthma) and the extent to which a physician has the capacity in accessing self-management resources, such as health counsellors, management programs and community-based treatments, has been associated with reduced risk of hospitalization (eg. in COPD).¹⁵ These risk factors are associated with an increase in acute episodes if ignored, and provides the potential for self-management training to support the management and prevention of people with chronic disease and potentially contribute to hospital avoidance.

Environmental Factors

Atmospheric Conditions

Atmospheric conditions (including air quality, atmospheric temperature, air pollutants) were predictive of hospitalization, but were only reported in a small number of studies. A four year large sample study found seasonal variation rates of hospitalization (i.e., highest in spring months) was significantly associated with the presence of air pollutants (levels of ozone, carbon monoxide, sulphur dioxide and nitrogen dioxide respectively). Variation was negatively correlated with climactic factors (i.e., low temperature, reduced hours of sun exposure and low barometric pressure).¹⁶ The findings highlight the need for early warning systems and pollutant monitoring devices to support individuals to manage their conditions more effectively.

Geographical Factors

A small number of studies reported significant relationships between hospitalization and geographical factors. Factors included distance from home to hospital (n=2), topographical barriers to access (n=2), and rurality/urbanization (n=7). Physical accessibility emerged as a predictor of hospitalization, but was associated with an unexpected pattern.

Physical barriers (eg hills, lakes or inlets, mountain or river crossing) increased the likelihood of an avoidable hospitalization, presumably due to the lack of primary care facilities and lack of ambulatory services. Likewise the influence of remoteness and rurality increased the likelihood of hospitalization for chronic disease.

Multiple factors impact on the geographical interaction between socio-economic status and residential area. Low-income neighbourhoods (eg those from ethnic minority groups or Aboriginal and Torres Strait Islander backgrounds) were more than 40% more likely to be hospitalized for an acute complication (Diabetes in this study).¹⁷ Fewer services per capita and a limited capacity to use the services, which could have been prevented through ambulatory care, resulted in a circular effect on hospitalization that is distinct from the issue of distance. Regional settings-based response that seeks to balance the tensions between multiple factors including the combined effect of the person-place interaction must be addressed to improve hospitalization rates associated with geographical factors.¹⁷

Briefing number 8 identifies a possible framework to understand avoidable hospital admissions.

Acknowledgments

This briefing is a summary of a research paper (in journal publication review)

Paper Title: **Determinants of avoidable hospitalization in chronic disease: Development of a predictor matrix**

Available at: www.gpqld.com.au/Programs/Collaborative_Research_Hub

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