COMPONENTS OF THE RISK INSTRUMENT FOR SCREENING IN THE COMMUNITY (RISC) THAT CORRELATE WITH PUBLIC HEALTH NURSES’ PERCEPTION OF RISK

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Abstract: Background: Functional decline and frailty are common in community-dwelling older adults, leading to an increased risk of adverse outcomes. Objective: To examine the factors that public health nurses perceive to cause risk of three adverse outcomes: institutionalisation, hospitalisation, and death, in older adults, using the Risk Instrument for Screening in the Community (RISC). Design: A quantitative, correlational, descriptive design was used. Setting and Participants: A sample of 803 community-dwellers, aged over 65 years receiving regular follow-up by public health nurses. Procedure and Measurements: Public health nurses (n=15) scored the RISC and the Clinical Frailty Scale (CFS) on patients in their caseload. We examined and compared correlations between the severity of concern and ability of the caregiver network to manage these concerns with public health nurses’ perception of risk of the three defined adverse outcomes. Results: In total, 782 RISC scores were available. Concern was higher for the mental state domain (686/782, 88%) compared with the physical state (306/782, 39%) and activities of daily living (595/782, 76%) domains. Concern was rated as severe for only a small percentage of patients. Perceived risk of institutionalisation had the strongest correlation with concern over patients mental state, (r=0.53), while risk of hospitalisation, (r=0.53) and death, (r=0.40) correlated most strongly with concern over the medical state. Weaker correlations were found for the other domains and RISC scores. The CFS most strongly correlated with the ADL domain, (r=0.78). Conclusion: Although the prevalence of concern was high, it was mostly rated as mild. Perceived risk of institutionalisation correlated most with concern over the ability of caregiver networks to manage patients’ medical state, while risk of hospitalisation and death correlated with patients’ medical state. The findings suggest the importance of including an assessment of the caregiver network when examining community-dwelling older adults. Validation of the RISC and public health nurses’ ratings are now required.

Key words: Screening, frailty, risk, adverse outcomes, public health nurses.

Introduction

Population ageing represents a considerable challenge for health and social care systems that are already struggling to meet the needs of the increasing numbers of older people, particularly during a period of economic adversity (1). The gains in longevity are undoubtedly something to be celebrated, but there has been a concomitant rise in the prevalence of disease and chronic conditions, including heart disease, arthritis, diabetes and dementia (2). As a result, there is growing international interest in reducing demand on acute hospitals services and residential care provision, by developing cost-effective interventions to support older people living in their own homes (3). The effectiveness of any intervention relies on the prompt identification of those older people who are likely to experience frailty and/or decline in function that may lead to adverse outcomes such as institutionalisation, hospitalisation, (admission to nursing home) or death. Once properly targeted, interventions can then reduce the burden on services through the allocation of resources, according to need.

Multidimensional interdisciplinary comprehensive geriatric assessment (CGA) is one of the key features of modern geriatric care (4). The assessment process facilitates the development of a coordinated and integrated plan for treatment and follow-up. CGA has been shown to improve outcomes for hospitalised older adults (4) and those assessed in the community (5). The success of CGA and subsequent patient management rely on the expertise of a dedicated team, including medical, nursing, physiotherapy, and occupational therapy specialists (4). It may not be possible or cost-effective to offer CGA to all older adults. It could be more appropriate, in the first instance, to identify those older adults at high risk of adverse outcomes and refer these individuals for more specialised assessment and management.

A variety of short screening tools have been developed to identify older adults at risk of functional decline, across a number of settings, for example, during hospitalisation (6), routine visits to the physician (7), and through self-reported
postal surveys (8). Other tools have attempted to predict the likelihood of adverse outcomes in the emergency room, including unplanned re-admissions (9). The predictive validity and generalisability of these tools has not been fully determined however, and currently there is no comprehensive screening instrument that is widely available, or used in the community, to simultaneously measure risk of hospitalisation, institutionalisation and death (10).

Multiple biological, social and psychological factors are associated with an increased risk of adverse outcomes (8), (9), (10), which can be grouped into three discrete domains: mental state, activities of daily living (ADL) and medical (including physical) state. These three domains form the basis of the short screening tool - the Risk Instrument for Screening in the Community (RISC) (11), formerly known as the Community Assessment of Risk Screening Tool (CARTS). The RISC was developed as part of a comprehensive screening, triage assessment and treatment programme - i.e. Community Assessment of Risk and Treatment Strategies (CARTS) [www. collage-ireland.eu]. The CARTS programme uses two tools - (i) the RISC and (ii) the more comprehensive assessment tool for those screened who are at greater risk of adverse outcomes - the Community Assessment of Risk Instrument (CARI) (12), (13).

The RISC identifies the presence and severity of concern in the three domains and quantifies the risk of adverse outcomes: hospitalisation, institutionalisation and death. Individuals scoring as medium or high risk are referred for a more detailed assessment. The RISC includes an assessment of the ability of the individuals’ caregivers, formal and informal, to manage their care needs. Formal caregivers refer to health care professionals, such as Public Health Nurses (PHNs) and home help. Informal caregivers includes family, friends, neighbours etc. PHNs visit patients in their home and may be in the best position to screen older community dwellers (14), (15), (16), (17).

This study examines the correlations between PHNs ratings of concern, in the three domains of the RISC, their interpretation of the severity of the risk of the three adverse outcomes, and their perceived view of the ability of an individuals’ caregiver network to manage these concerns.

Methods

A quantitative correlational descriptive design was used.

Sample

A convenience sample of older adults (n=803), aged 65 years and older, under regular follow-up by PHNs, in two community areas in a Southern County in Ireland, were assessed. Those living in nursing homes, or other long-term care institutions were excluded.

Outcome measure

The Risk Instrument for Screening in the Community (RISC)

The RISC has three domains: (i) Mental state (i.e. cognition, mood, psychiatric issues and behaviours), (ii) Activities of Daily Living (basic ADL; self-care activities such as grooming, dressing, mobility, feeding and instrumental ADL; managing shopping, finances, medication management) and (iii) Medical (including physical) state (medical problems, medical conditions, falls, nutrition and environment). A space is provided for the assessor to include other issues where necessary (see Appendix 1).

The scoring of each domain follows three steps. First, ‘cause for concern’ is scored dichotomously (i.e. yes or no). If there is no concern, the rater simply moves on to the next domain. If there is concern, the rater scores the ‘severity of concern’ on a scale of 1-3 (mild, moderate or severe). The ability of the caregiver network to manage the care needs on a five-point Likert scale of 1-5 (1 = can manage, 5 = absent/liability), is then scored. The caregiver network represents all of the formal and informal resources, and services that are available to the person. The effectiveness of the caregiver network and severity of concern, are taken into account when completing the global risk scores. The risk of the three adverse outcomes (institutionalisation, hospitalisation, and death) occurring in the next year, are then scored on a Likert scale from 1-5 (1 = minimal /rare, 5 = extremely likely/certain).

Frailty Measure - Clinical Frailty Scale

The Clinical Frailty Scale (20) is a nine-point scale that stratifies older adults according to their level of frailty. Scores range from one (very fit) to nine (terminally ill).

Data Collection

Training program

PHNs received a short face-to-face training workshop (approximately 4 hours) that was developed to establish optimal understanding of the tool and to maximise inter-rater reliability (IRR), between the trainees (18). At the start of the training, the PHNs were asked to score six standard cases; two low-risk, two medium-risk and two high-risk. The programme explains the concept of risk, the different elements of the instrument, and scoring criteria using the six sample cases as examples. Upon completion of training, PHNs were requested to score six different cases (two low-risk, two medium-risk and two high-risk). Their scores were correlated against those generated by a panel of experts to facilitate an evaluation of each trainee’s performance and understanding of the instrument. Those who “passed” were certified, and those who required further training were identified. High levels of IRR have been demonstrated in Ireland (18) and in Australia (13).

The PHNs (n=15) who successfully completed the training and were certified accordingly, completed a desk-based clinical
assessment from patient records of older adults, within their caseload (n=803), using the RISC tool and the Clinical Frailty Scale (20). Ethical approval was obtained in advance, from the Cork Research and Ethics Committee of the Cork University Hospitals, Ireland.

Data Analysis
The Statistical Package for Social Sciences (SPSS 17.0 for Windows) was used for storage, analysis and presentation of data. A data coding framework was designed and pre-coded data from all questions on the scales were tabulated and entered into SPSS. Data were analysed using descriptive and inferential statistics. Normality was tested using the Shapiro–Wilk test. The majority of the data were not normally distributed and were analysed using Spearman (non-parametric) correlation coefficients.

Results

Demographic Characteristics
The RISC was scored on 803 patients living in urban/suburban districts of Cork City and County; 516 were female, (64%) and 287 male (36%). Their mean age was 79.8 years (SD: 7.4). Females were significantly older than males (p = 0.04) with mean ages of 80.2 years, standard deviation (SD) = 7.4 and 79 (SD = 7.5) respectively. The majority of the patients (n=723, 90%) lived in their own homes, and nearly half lived alone (n = 374; 47.4%). Other variables were collected and are reported elsewhere (12).

Risk Instrument for Screening in the Community scores
The RISC score was available for 782 out of 803 patients, with 21 patients, who had not been reviewed within the last six months, excluded. The frequency scores for the RISC are presented in Table 1. There was a higher rate of concern for the medical state, with 686/782 (88%) deemed to have issues relating to this domain, compared to the other two domains: 306/782 (39%) for mental state and 595/782 (76%) for ADL, although this concern was rated as severe for only a small percentage, 26/782, (3%) of the total sample. The ratings suggest that overall, the caregiver network was perceived to manage care across all three domains, with only 1% of the total sample considered to either be unable to manage (“cannot manage”) or “absent/liability”. The majority of the sample was perceived to be at minimal/low risk of each of the three adverse outcomes.

The Clinical Frailty Scale
The Clinical Frailty Scale was available for 784 patients (97%), 426 (54.3%) of whom scored >5 and were categorized as frail. A further 171 (21.8%) scored 4, i.e. demonstrating
vulnerability to frailty, while 187 (23.9%) scored three or less, i.e., classified as very fit, well or managing well (robust).

### Correlational analysis

The relationship between Global Risk scores (institutionalisation, hospitalisation, and death) and the other measures (severity of concern and caregiver network) across the three domains (Mental State, ADLs and Medical state), were examined using Spearman’s correlation coefficients (Table 2).

Risk of Institutionalisation had the highest correlation with the severity of concern and the perceived ability of the caregiver network to manage that risk, for the patients’ mental state (r = 0.53, p <0.001), ADL (r = 0.47 and 0.55 respectively, p <0.001), and the frailty measure (r = 0.42, p <0.001). It seems that as concern over these areas increases, so does the strain on the caregivers, leading to the possible need for long-term care placement. Risk of Hospitalisation had the highest correlation with severity of concern for the medical state (r = 0.53, p <0.001) and with the frailty measure (r = 0.43, p <0.001). There was a moderate correlation between Risk of Death and the severity of concern over the patients’ medical state (r = 0.40, p <0.001). Weaker correlations were found for the other domains and RISC scores. All of the correlations reached statistical significance at the 0.001 level.

The Clinical Frailty Scale most strongly correlated with the ADL domain. In particular, it correlated strongly and significantly with both the severity of the concern for ADL (r = 0.78, p <0.001) and concern over the ability of the caregiver network to manage a patients’ ADL (r = 0.70, p <0.001). Correlation with the other domains were significantly weaker (p <0.001), than for ADL, see Table 3.

### Discussion

This paper presents the internal correlations of the RISC, a new multi-modal risk screening instrument, for use in community dwelling older adults. The results of the internal correlations contribute to an understanding of the relationship between factors associated with adverse outcomes in older adults, and the perception of risk as quantified by PHNs. The results suggest that PHNs’ concerns related to patients’ mental and functional (ADL) states were associated with a perceived risk of institutionalisation. This risk is likely to be exacerbated if the caregiver network is experiencing difficulties managing these areas. These findings are consistent with other
RISC COMPONENTS AND PERCEPTIONS OF RISK

studies that have suggested that predictors of nursing home placement are mainly based on underlying cognitive and/or functional impairment, and associated lack of support and assistance in daily living (21). In the current study, perceived risk of hospitalisation and death were most strongly correlated with concerns over patients’ medical state. This is intuitive as medical conditions are more likely to place an individual at risk of hospitalisation and of dying, than institutionalisation.

This study is one of the first to examine the perceived impact of a patient’s existing caregiver network on their perceived risk of adverse outcomes. In general only a small number of caregiver networks were felt to be failure. Concerns over a patient’s caregiver network’s ability to manage mental and functional (ADL) states correlated most strongly with their perceived risk of institutionalisation. Correlations between the caregiver network and other adverse outcomes were much weaker, albeit statistically significant. There are a number of possible explanations for the lower correlations between the caregiver network and risk of hospitalisation/death. First, informal caregivers who are frequently older themselves (22) may not have the necessary skills or abilities to manage complex medical conditions in the home. Second, the focus of home-care services is often on the completion of household tasks and/or personal care (24), rather than meeting medical needs. Finally, while it is possible to deliver professional and effective acute medical care in the home (25), it is not readily available in many settings. Other studies have suggested that effective discharge planning and continuity of care post-discharge, can reduce unplanned hospital re-admissions for older adults, although factors associated with re-admission are not well understood (23), (26), (27). The on-going prospective study validating the RISC and following this cohort of older adults, may help to clarify some of these factors.

There was a high prevalence (54%) of frailty defined by the Clinical Frailty Scale, among this cohort of older adults. This could be expected as the sample was taken from the existing caseloads of the PHNs and as such, these older adults are more likely to have medical and other co-morbidities, than a cross-sectional sample of all community-dwelling older adults. The Clinical Frailty Scale produced moderate correlations across all adverse outcomes, mainly correlating with components of the ADL domain. This would be expected given that the Clinical Frailty Scale primarily assesses ADL. In addition, it does not include an assessment of the caregiver network and may as a result, under- or over-estimate the risks.

This study has a number of limitations. This study was a retrospective review of patients’ PHN records and depended upon patients having been reviewed recently. Some demographic data, including 21 RISC and 19 CFS scores were not available, which may have led to bias. It is however important to note that the PHNs involved in this study were very familiar with the older adults they assessed, and the RISC was designed with this in mind. Previous analysis of a risk register suggested that PHNs needed a quick screening tool to support their judgements in terms of allocating resources to those most in need (28). Other professionals, who have less knowledge about a particular client, may need to gather additional information before using the RISC. Likewise, the patients included (those under active follow-up) were more likely to be at greater risk of adverse outcomes than a cross-sectional community sample. This may also have created bias. Furthermore, the study is limited by the analytical techniques employed. While correlations are useful in examining the interaction between different components of instruments, they do not establish predictive ability. Future research is now required to operationalise the domains and scoring system and add to its usability across other groups of health and social care providers. A one-year follow-up study that measures the predictive validity of the tool by recording the rates of institutionalisation, hospital admission and mortality amongst the original sample, is now underway.

In summary, the RISC is a promising new screening tool that will assist healthcare professionals working in the community to identify older adults at risk of adverse outcomes. Those at medium or high risk can be referred for a more detailed assessment and resources allocated to prevent or delay these events. The inclusion of an assessment of the caregiver network may help to direct interventions that help older adults to receive appropriate levels of support to meet their needs and remain in their own homes for as long as possible (29). This study proposes that the efficacy of the caregiver network is as important in contributing to risk of nursing home placement as the actual underlying concerns over patient’s mental and functional states and as such, it should be taken into account when screening frail older adults in the community.

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Conflict of interest: The authors report no conflict of interest.

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RISC COMPONENTS AND PERCEPTIONS OF RISK

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Appendix 1
Risk Instrument for Screening in the Community (RISC) Score Sheet

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