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Original Research

Testing the validity, reliability and utility of the Self-Administration of Medication (SAM) tool in patients undergoing rehabilitation

Jessica Anderson, B.Sc. (Hon.)[a,b], Elizabeth Manias, Ph.D.[a,b,*], Snezana Kusljic, Ph.D.[a], Sue Finch, Ph.D.[c]

[a] *Melbourne School of Health Sciences, Faculty of Medicine, Dentistry and Health Sciences, The University of Melbourne, Parkville, Victoria 3010, Australia*
[b] *Royal Melbourne Hospital Academic Centre, Parkville, Victoria 3010, Australia*
[c] *Statistical Consulting Centre, The University of Melbourne, Parkville, Victoria 3010, Australia*

Abstract

Background: Determination of patients' ability to self-administer medications in the hospital has largely been determined using the subjective judgment of health professionals.
Objectives: To examine the validity, reliability and utility of the Self-Administration of Medication (SAM) tool as an objective means to determine patients' ability to self-administer in a rehabilitation unit of a public teaching hospital in Melbourne, Australia.
Methods: To assess validity of the SAM tool, associations were examined between the total SAM tool score and of the patients' competence to self-administer from the perceptions of the tool administrator, patients and nurses. Validity also was determined from a principal component analysis. Pearson correlations were calculated for how SAM scores related to scores obtained from the Functional Independence Measure (FIM) and Barthel Score Index (BSI). To assess the SAM tool's reliability, a Cronbach's alpha coefficient was calculated. Utility of the SAM tool was evidenced by documenting its administration time.
Results: One hundred patients participated in this study. The SAM tool had a Cronbach's alpha coefficient of 0.75 and took a mean time of 5.36 min to complete. The capability to self-medicate section of the SAM tool had strong correlations with the FIM ($r = 0.485$) and BSI ($r = 0.472$) data, respectively, and the total SAM tool had moderate and strong correlations with the nurses' ($r = 0.315$) and tool administrator's ($r = 0.632$) perceptions of patients' ability to self-administer, respectively. Bland-Altman and ROC curve analyses showed poor agreement between the total SAM tool score and the nurses' perceptions.
Conclusions: The SAM tool demonstrated acceptable overall internal consistency. It only requires a short time to be completed and is more objective than seeking out health professionals' perceptions. Additional research is needed to further validate this approach to determining patients' ability to self-medicate.

* Corresponding author. Melbourne School of Health Sciences, Faculty of Medicine, Dentistry and Health Sciences, Level 7, Alan Gilbert Building, The University of Melbourne, Parkville, Victoria 3010, Australia. Tel.: +61 3 8344 9463; fax: +61 3 8344 5391.
E-mail address: emanias@unimelb.edu.au (E. Manias).

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Self-Administration of Medication (SAM) involves allowing patients to take their own medications in the hospital, under varying levels of supervision from health professionals such as pharmacists, nurses and doctors.[1] Evaluations of hospital inpatient SAM programs have shown improvements in patient satisfaction, patient knowledge and independence, and customized care in patients' management of medications.[2,3] SAM allows for more appropriate timing of medications[4–6] and decreases medication error rates in hospital.[7–9] The practice of SAM also has been found to decrease medication related problems in the community,[8,10] improve medication adherence[10–13] and decrease hospital readmission rates.[14]

Past work has shown that health professionals are not good at predicting patients' ability to perform activities such as managing their medications.[15] For this reason, various tools have been developed to assess patients' ability to self-administer using patients to complete the tools. A number of these tools measure patients' functional ability to administer medications.[16,17] An example includes the Medication Management Evaluation Instrument, where patients must read a prescription label, open and close a child-resistant and non-child-resistant cap and remove 2 tablets, interpret directions and differentiate tablets by color.[18] There are tools that consider patients' cognitive function,[19–21] such as the Cognitive Screen for Medication Self-Management that assesses sensorimotor, visuo sensory and clock-reading ability, as well as mental calculations, prospective memory, encoding, recall and executive functioning.[22] Several tools test patients' medication knowledge by considering their ability to follow a hypothetical medication regimen.[23–29] In the Medication Management Ability Assessment, a medication regimen with 4 mock medications is described to individuals and 1 hour later they have to demonstrate administration of the regimen, at the correct dose and time.[30]

There are also tools that test patients' knowledge of their own medications.[31–35] The Drug Regimen Unassisted Grading Scale requires individuals to name each of their own medications, open their containers, dispense the correct dose and report the correct administration times.[36] Unfortunately, there are only few tools that consider all 3 aspects: patients' functional ability, cognition and medication knowledge. The Pharmacy Assessment, designed by Romonko and Pereles[35] and the Self-Medication Risk Assessment Instrument (SMRAI), developed by Fuller and Watson,[20] are examples that consider all three aspects. Many also have long administration times ranging from 15 to 30 min, require additional equipment such as pseudo prescriptions, vials, labels, medication aids and medications prepared by pharmacy, and have not had adequate validity or reliability testing.

The SAM tool was developed to comprehensively examine patients' functional ability to self-medicate, patients' cognition, patients' knowledge and behavior of their own medication regimen and experience with self-medication.[1] The tool also takes into consideration patients' perceptions of their competence and desire for SAM. Previous validation work on the SAM tool showed it had high content validity scores for clarity, representation and comprehensiveness, with content validity index values ranging from 0.95 to 1.0.[1] The total SAM score correlated with measures of cognition ($r = 0.688$, $P = 0.0001$), self-reported adherence ($r = 0.434$, $P = 0.002$), functional independence ($r = 0.636$, $P = 0.0001$), self-efficacy ($r = 0.498$, $P = 0.001$) and dexterity ($r = 0.3610$, $P = 0.012$).[1] It had good internal consistency with a Cronbach's alpha of 0.899, and in over 43 valid cases, 95.3% of nurses agreed on patients' competence or lack of competence to self-administer using the SAM tool.[1]

Research undertaken to initially validate the SAM tool had a number of limitations. The tool was tested in an Australian private hospital, in a middle-class suburb, and all participating patients were required to be able to read and write English.[1] Most patients were from an Anglo-Saxon background, had high levels of education and demonstrated high levels of ability to self-medicate. To explore capabilities with a wider patient demographic, there is a need to test the tool in public hospitals, where the cultural mix of patients is generally greater, patients come from a variety of socioeconomic backgrounds and patients often have different levels of ability.[1] Addressing this gap in the psychometric assessment of the tool is important in terms of ensuring its ready applicability to patients from diverse backgrounds. The purpose of this study was to examine the SAM tool's validity, reliability and utility in a rehabilitation unit of a public teaching hospital in