

Is there a correlation between cognition and the ability to remember how to use assistive devices?

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Abstract

Purpose – This study aims to establish a correlation between a patient's mini mental state examination (MMSE) score and their ability to remember how to use common assistive dressing devices.

Design/methodology/approach – The study was a prospective, cross-sectional and correlational study. A final sample of 63 patients formed the study. Patients' cognition was measured using the MMSE, and a new assessment tool was developed to assess patients' ability to use three assistive devices and piloted on 15 patients to address normality, reliability, validity and clinical usefulness. Pearson's rank correlation coefficient was used to establish direct correlations between the MMSE score and the assessment tool score. Eta squared was used to calculate the effect size to achieve an indication of the difference between the groups. Ethical approval had been granted by the regional ethics committee. The null hypothesis states that patients with an MMSE score of 22 or less show no difference in their ability to safely and appropriately use assistive devices provided and demonstrated by an occupational therapist than patients with an MMSE score of 23 or higher.

Findings – The null hypothesis was rejected and patients with an MMSE score of 22 or less showed a significant difficulty in their ability to use the three devices. Correlation coefficients showed significant positive correlations between MMSE scores and assistive devices scoring tool results for all three devices: Helping hand ($r = 0.677, n = 60, p = 0.01$), shoe horn ($r = 0.649, n = 54, p = 0.01$) and sock aid ($r = 0.877, n = 54, p = 0.01$).

Originality/value – The study is in an Irish context and demonstrated primary, objective evidence of the impact of impaired cognition on functional ability. Patients with cognitive deficits pose a larger safety challenge but still should be afforded an opportunity to use and benefit from assistive devices. The assessment tool is a new and unique instrument and although requires further development, may conceivably act not just as an assessment instrument but also an effective treatment tool.

Keywords Assistive devices, Cognitive impairment, Mini mental state examination

Paper type Research paper



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Introduction

There is a significant research gap in the field of provision of assistive devices (AD) including a shoe horn, sock aid and helping hand by occupational therapists. Although patient safety, cognition and appropriateness of the intervention is at the heart of the study, there are also significant implications for cost effectiveness, compliance and training which the study also aimed to address.

In light of the growing concern about the future of occupational therapy research, the [Department of Health and Children \(DOHC\) \(2010\)](#) commissioned a project to identify research priorities for the six therapy professions in Ireland including occupational therapy and urged researchers to provide evidence of clinical and cost effectiveness of interventions.

ADs are provided in the acute and community setting although the provision of assistive dressing devices is primarily the work of the hospital occupational therapist in the traditional “dressing practice”. This practice is one such intervention where holism and quality care are being challenged, as many devices are prescribed without any evaluation of cognition. There is a growing concern that the cognitive ability of patients to learn and retain knowledge of ADs is not thoroughly evaluated.

There is a strong need to marry a cognitive score with a patient’s ability to safely and appropriately use ADs, based on objective data, to target patients who are more likely to benefit from ADs. Furthermore, this will also highlight patients’ with cognitive deficits who may require further demonstration and training with ADs before discharge from the hospital and continued care in the community.

The aim of the study was to ascertain whether patients in an acute regional hospital with a mini mental state examination (MMSE) score of 23 or better can effectively remember to use prescribed and demonstrated devices and if patients with an MMSE score 22 or less are unable to effectively use the devices.

Literature review

Introduction

Within occupational therapy, there is a significant emphasis on evidence-based practice; however, many practice areas are largely based on what has been done historically and what appears to work well. The practice of providing AD by occupational therapists in the acute setting is often conducted quickly and routinely without due consideration being given to the patient’s cognitive ability. AD devices are a financial strain on any department budget. The annual non pay budget for an occupational therapy department in an acute hospital has been reduced by as much as 61 per cent since 2006 [[Health Service Executive \(HSE\), 2011](#)]. Subsequently, it is pertinent to ensure adequate clinical reasoning when providing AD to effectively manage departmental budgets. An extensive literature search was carried out using the search strategy described by [Polit *et al.* \(2001\)](#). Databases searched were Cinahl Plus, Medline, Psychoinfo, Psychology and Soc Index. Occupational therapy specific databases searched included occupational therapy seeker, OTD base, occupational therapy education finder and the physiotherapy database Pedro.

The history of provision of assistive device

The provision of AD has a long association with occupational therapy and is rooted in its practice. According to [Neville-Jan *et al.* \(1993\)](#), the history is traced back to the mid 1940’s and the end of World War II when there was a strong move towards rehabilitation. Although occupational therapy literature is consistent in the endorsement of ADs to promote independence, there is a limited evidence base for the rationale for using AD beyond the realms of total hip replacement (THR) and biomechanical principles.

Smith (1995) describes a client centred model for equipment provision through a single case study design. Although this research is clearly dated and lacking in evidence base, it makes the important point that the focus must shift from devices as being the solution, to a more client centred approach, which includes cognitive evaluation. No further studies have attempted to build on this work.

Usage rates and teaching

Research into usage rates of AD is abundant in the literature. Two literature reviews, Kraskowsky and Finlayson (2001) and Wielandt and Strong (2000), feature the most extensive collective body of research and conclude that compliance and usage rates vary significantly from 46 to 86 per cent compliance with AD. The reviews concluded that equipment suitability, adequate assessment and effective teaching were paramount in the effective provision of AD. Both reviews also concluded that further research was crucial, especially around optimal device use. Despite this, there are few up to date studies, which is a concern, as ADs are constantly being redesigned and changed.

There is no universal consensus in the literature about the best way to demonstrate and teach the use of AD. Moreover, research in the literature is largely confined to teaching dressing skills, rather than teaching the use of AD. The few studies that target AD use patients who are cognitively intact which makes teaching and demonstration easier (Schemm and Gitlin, 1998), (Guidetti and Tham, 2002). Teaching the use of AD should not only include technical information but also consider psychological and cognitive factors such as trust and understanding. Furthermore, it needs to use a variety of communication and teaching methods, which incorporate the value of both holistic and client centred practice.

The abandonment of assistive device and the role of occupational therapy

Reasons for abandonment of AD feature prominently in the literature; however, contemporary evidence-based research is lacking. Thomas *et al.* (2010) have explored the reasons for noncompliance with AD, targeting patients following THR. There is general agreement that reasons for abandonment fall into four common themes: a non-collaborative approach in prescription, poor instruction from therapists, an improvement in physical ability and help from spouses (Gitlin and Burgh, 1995). Most abandonment studies are definitive in that they ascertain whether devices are used or not. It is of perhaps greater concern to establish whether AD are being used safely and appropriately according to their primary prescription.

The ability to dress and undress is one of the most fundamental aspects of human occupation and the activity of "dressing practice" is often reviewed as occupational therapy's single largest contribution to the assessment and treatment of self-care tasks. Dressing is a complex activity and although McIntyre (2005) describes how physical difficulties are often easier to highlight and address, she describes the unravelling of cognitive, perceptual and executive functions in relation to dressing practice as much more difficult to address. Unfortunately, there is limited evidence in this area to guide occupational therapy practice, thus leaving practitioners largely to their own intuition, experience and knowledge.

There are up to 50 standardised activities of daily living (ADL) assessments available to occupational therapists (Boop, 2011). The difficulty however is that many of these assessments examine a range of tasks such as feeding, toileting and dressing rather than comprehensively targeting a single skill or task. The need to use valid and reliable

assessments is well documented to enhance evidence based practice and research; however, there are currently no available tests to target specific AD use and skills.

The relationship between cognition and assistive device

The relationship between cognition and AD use is not well interlinked in the literature. Indeed, only one retrieved study, [Nochajski et al. \(1996\)](#), can be found which targets the use and satisfaction with AD by older persons with cognitive impairment. The authors concluded that there is a need “for on-going therapist involvement to assess changes and provide devices and interventions appropriate to the status of the individual” (p. 29). No further studies have built on this research.

The under detection of cognitive impairment and its increasing prevalence has brought cognitive assessment and screening to the forefront. Despite the wide use of the MMSE, attempts to use its results when prescribing and utilising AD is not well researched. No known study has directly attempted to correlate an MMSE score with a patient’s ability to appropriately use AD. The MMSE is ideally placed to identify a level of cognition because of its frequent and popular usage by occupational therapists and its strong psychometric properties ([Douglas et al., 2007](#)).

Occupational therapists working in the acute setting need to re-examine their rationale for providing AD in relation to cost, but more importantly they have a duty to their patients to appropriately assess for and prescribe AD using a more patient centred approach, which targets the appropriateness and safety of future AD use. There was a strong rationale for this study based on the lack of research identified in the literature and the research priority to provide evidence of clinical and cost effectiveness for occupational therapy interventions.

Methodology

The fundamental aim of the study was to ascertain whether patients with an MMSE score of 23 or higher can remember how to use the AD and if patients with an MMSE score of 22 or less are unable to remember how to use the AD.

The most widely accepted and frequently used cut off score for the MMSE is 23 out of a total of 30 ([Cullen et al., 2005](#); [Koder and Klahr, 2010](#)). Scores of 23 or lower indicate the presence of a cognitive impairment but should not be used to make a formal diagnosis, as warned by the authors. In this study, an MMSE score of 22 was used as the cut off, as several authors have challenged the use of 23 as being under representative of cognitive impairment ([Lopez et al., 2005](#); [Friedman et al., 2011](#)) and to provide definitive quantitative correlation. The literature also stresses that raw MMSE scores should be adjusted for age and education and population norms developed by [Crum et al. \(1993\)](#) should always be used when necessary. This was done for this study.

The study objectives were as follows:

- to evaluate a patient’s ability to effectively use the AD directly after demonstration using a reliable and validated scoring tool developed by the researcher;
- to re-evaluate patients’ ability to effectively use the AD 48 hours later using the objective scoring tool; and
- to examine the relationship between MMSE scores and the AD scoring tool results using descriptive and inferential statistics.

In terms of the study process, all patients were in-patients of an acute regional hospital and the researcher was a senior occupational therapist.

All patients had been initially referred to the occupational therapy service for assessment and treatment and all patients had an MMSE score as part of their initial assessment.

The three ADs used were a long handled shoe horn, a sock aid and a helping hand which are commercial devices and have CE marking.

Patients who were deemed suitable for the provision of AD by an occupational therapist were deemed suitable for the study and patients who were eligible and had consented to the study were brought to the occupational therapy assessment bedroom where the research took place. Patients were also asked to bring their own shoes and socks.

The researcher demonstrated the use of 1, 2 or 3 AD using a structured teaching protocol developed by the researcher and the researcher then repeated the demonstration procedure.

Patients were then asked to use the AD and were assessed on their ability based on the objective scoring tool. A total score out of 10 could be achieved. The patients were escorted back to the occupational therapy department 48 hours later and reassessed on their ability to remember how to use the AD based on the scoring tool.

The researcher did not provide any demonstration at this stage and the researcher was also blinded to the patients' MMSE score when demonstrating and assessing the use of the AD.

A pilot study of 15 patients was conducted over a three-month period prior to the main study, and the specific design for the study was a prospective, cross-sectional and correlational study which is common in rehabilitation research.

In terms of sample size, an estimation of 60 participants was made based on referral numbers, a department log, use of statistical software and the pilot study to ensure that acute hospital attrition were factored into the final sample.

The *p*-value/significance level was set at 0.05 and statistical power set at an accepted level of 80 per cent and formal ethical approval for the study was granted by the research ethics committee.

Structured teaching protocol

As part of the analysis process for the teaching protocol, a total of ten occupational therapists were sought to individually demonstrate the use of all three ADs. Permission and consent was requested from each individual occupational therapist. Demonstration was videoed and analysed for content, common themes and terminology. A tally table of findings was constructed for each AD for all 10 occupational therapists and totalled by the researcher. A non-clinical member of the occupational therapy staff was employed in the patient role for demonstration of the AD in this process and again consent, confidentiality and data protection applied.

Other important aspect of the demonstration process was the allowance of two practice attempts before testing and retesting in 48 hours in keeping with current clinical practice and to consolidate working memory and motor planning.

Instrument development

In the absence of specific ADL assessments which target dressing skills and the use of AD, a new instrument was developed which was specifically designed to assess the ability to use all three ADs. The following process guided the development:

- An occupational therapy focus group of ten occupational therapists, researcher experience and aspects of the Klien Bell ADL score, which has strong interrater reliability, were used as content analysis.

- The focus group was conducted, audiotaped and analysed by the researcher.
- Three versions of the instrument were compiled and given back to the ten occupational therapists for opinion and feedback.
- The researcher collated the findings and decided which was the most appropriate and popular version.

The assessment was also reviewed for normality, reliability, validity and clinical usefulness using SPSS, and Pearson's correlation was used and a correlation score greater than 0.7 was taken as an indicator of significance.

A Cronbach's alpha value of 0.95 was used to determine the internal reliability of the instrument.

The predictor variable was the MMSE score and the criterion value was the demonstration and provision of the ADs, and Scatter plots were used to present data and establish the correlations.

All aspects of the study were undertaken and funded by the researcher.

It was decided to use one instrument as a generic tool for all three ADs, with a consistent scoring method with scores out of a possible 10 and 1 mark for each criterion achieved. Patients were seen as able to perform or unable to perform. Ten criteria were established in the final version of the tool. Criteria 1-4 targeted whether the patient could appropriately name, identify, select the garment, manipulate and demonstrate appropriate safety awareness with the AD. Criterion 5 targeted the correct sequence for the use of the device which was as per the standard demonstration procedure and provision was made in the assessment tool for the recording of this. The tool also recorded whether the patient was independent with the AD and independent as per the structured demonstration. One of the principal concerns from the occupational therapists' qualitative review was the need to decipher between a patient using the AD independently and using the AD independently as initially demonstrated. Evidence shows that many patients manage AD independently but this is not consistent because they lack a structured, learned procedure (Griffin *et al.*, 2007). The tool also caters for awareness of success and failure with the AD, and performing the task within an appropriate time frame. A period of 15 min was chosen for this tool both for practical and ethical reasons. The same tool was used in the subsequent evaluation 48 hours later. This timeline was chosen based on current practice, practical limitations of an acute hospital and to allow working memory to be evaluated.

A copy of the assessment tool is provided in [Appendix 1](#), and a description of the assessment tool properties is provided in [Appendix 2](#).

Particular emphasis was placed throughout the study on the retention of subjects, which is a concern in research involving older persons (Bowsher *et al.*, 1993), and included positive communication and respect for patients' time. The fact that all patients were acute hospital patients meant that the researcher's primary concern was not to cause undue pain, discomfort or stress.

To increase the homogeneity of the study, a number of diagnoses were excluded from the study because of their direct influence on cognition, ability to physically use the AD or the patients' knowledge and previous use of the AD.

The null hypothesis for the study states that:

Patients with an MMSE score of 22 or less show no difference in their ability to safely and appropriately remember how to use AD provided and demonstrated by an occupational therapist than patients with an MMSE score of 23 or higher.

Results

Demographics

Data were collected over a four-month period. The total number of valid participants was 63, which was the desired sample size. There was an almost equal split of males and females in the study with 33 female and 30 male participants. The mean age was 72.33 with a minimum age of 36 and a maximum age of 96. Although the age profile generally follows a normal distribution, there was a high frequency of participants in the 80 years age group which is above the mean score. There was a significant range and diversity of diagnoses. Chronic obstructive pulmonary disease was the most common diagnosis, while falls, chronic cardiac failure and fractured neck of femur also featured prominently in the study. The mean MMSE score was 22.76 and also followed a normal distribution. There were nine readmissions in the following six months post discharge, although specific data concerning their readmission are lacking and were not a primary aim of the research.

Correlations between mini mental state examination and helping hand. There was a large positive correlation between MMSE scores and times 1 helping hand, ($r = 0.598$, $n = 60$, $p = 0.01$) and an even larger positive correlation ($r = 0.677$, $n = 60$, $p = 0.01$) for MMSE scores and times 2 helping hand. This means that with decreasing MMSE score comes a decrease in the ability to remember to use the helping hand appropriately. This correlation gets even stronger with time. (See [Figure 1](#) showing correlation of MMSE scores with times 2 helping hand).

Correlations between mini mental state examination and shoe horn. There was again a large positive correlation between MMSE scores and times 1 and 2 shoe horn. ($r = 0.646$, $n = 54$, $p = 0.01$) ($R = 0.649$, $N = 54$, $P = 0.01$) indicating that lower MMSE scores are associated with lower scores on the assessment tool. (See [Figure 2](#) displaying MMSE and times 2 shoe horn).

Correlations between mini mental state examination and sock aid. The correlations obtained concerning MMSE and sock aids again displayed strong positive correlations. The most significant of all correlations was between MMSE and times 2 sock aids ($r = 0.877$, $n = 54$, $p = 0.01$) as shown in [Figure 3](#).

There was a statistically significant decrease in scores from times 1 to times 2 for all ADs and a large Eta Squared effect size: Helping hand 0.59, shoe horn 0.45 and sock aid 0.64. Clearly, the sock aid showed the largest effect size of all ADs. This means that the sock aid,

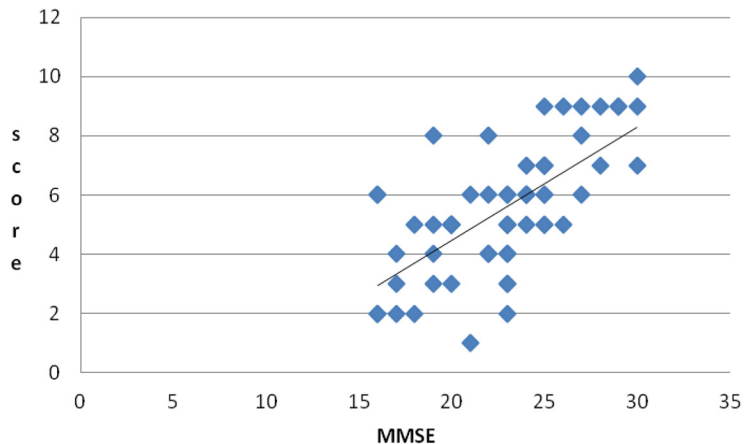


Figure 1.
Correlation of MMSE
scores with times 2
helping hand

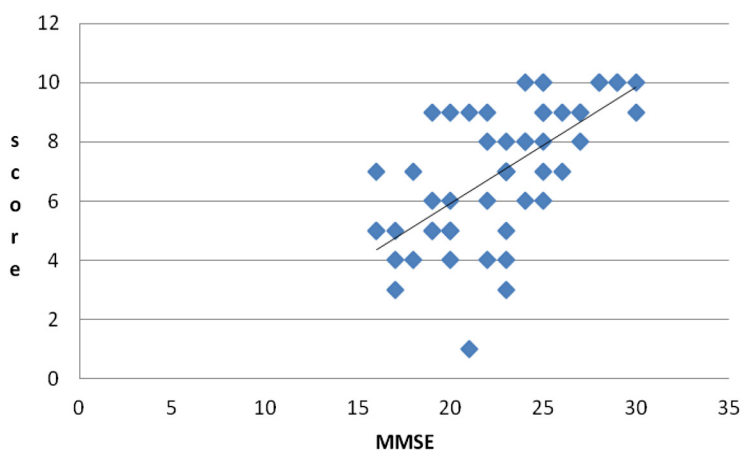


Figure 2.
Correlation of MMSE
scores with times 2
shoe horn

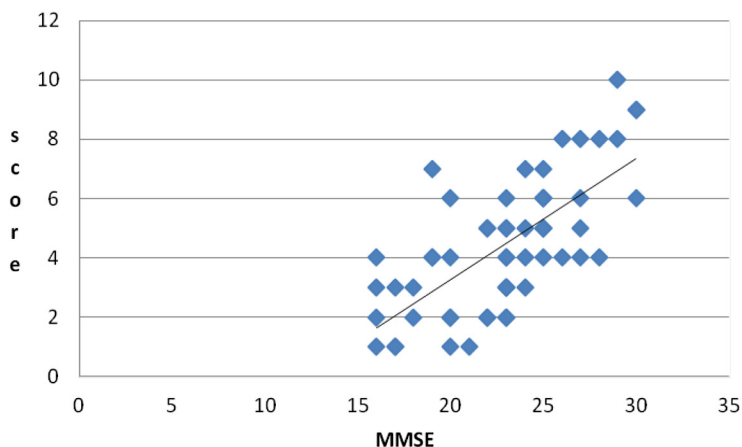


Figure 3.
Correlation of MMSE
scores with times 2
sock aid

which was the most complex of all three ADs, was deemed the most difficult device to use particularly after 48 h had elapsed and particularly with patient's with lower MMSE scores

Results of the study obtained from the correlations indeed indicate significance and an unlikelihood that the results are because of chance. In this study, the null hypothesis can be rejected; however, literature warns that results are still based on probability and the importance of cautious interpretation must be stressed (Field, 2005).

Discussion

Despite cautious interpretation, a statistically significant relationship between variables is a pre-condition of causality, and therefore the results must be interpreted as positive. This study has provided primary, objective evidence of difficulties with decreased cognition and functional ability with AD. This is a potentially significant finding in the light of current occupational therapy practice.

Occupational therapists are at the very core of discharge planning in the acute hospital and are facing increasing pressure to safely facilitate a discharge and enable patients to

return home at the earliest possible time. Although the concept of decreased length of stay is important, it must not be abused in the pursuit of high-quality patient care as warned by [Williams *et al.* \(2010\)](#). The provision of AD is one area where time, patient centeredness and indeed accountability are required.

The study has also highlighted a clear shift in the provision of AD from traditional physical diagnoses such as THR to more medical, chronic based diagnoses. This provides an even greater rationale to use individual methods of assessment and treatment and avoid the “one size fits all” practice of AD provision.

The fact that scores have disimproved does not mean AD should be dismissed. Occupational therapists should trust their clinical reasoning about why they are required in the first instance and aside from cognitive issues, need to shift their focus to a more individualised training experience for their patients. Time and practice should remain the cornerstone of the intervention.

In addition, effective teaching of the use of AD often involved not just patients but caregivers, and this provides a further incentive and need to develop and implement effective teaching strategies for all persons involved in AD provision.

A concerning observation from the study was the amount of readmissions to hospital after several weeks, of patients who were discharged home with ADs. Although specific data is lacking, it is still an alarming reflection. The ability or inability to remember to use AD may not have caused their readmission, but a careful prescription and teaching of AD may well contribute to more independent living at home. The cost of a hospital admission is much more significant than the cost of AD and the level of intervention needed to make them successful ([Deloitte and Touche, 2008](#)). A true cost benefit analysis would ultimately show them to be a value for money intervention.

At the heart of this study was cognition. Occupational therapy plays a crucial role in the assessment of cognition and is considered expert in advanced cognitive assessments. It is imperative that all patients who receive AD also have some assessment of cognition to get a more holistic picture of their needs. This should be done as part of good practice.

Ineffective or inappropriate intervention is perhaps more problematic than no intervention at all and this may be particularly important for AD. AD used wrongly may be unsafe or even hazardous.

The study also calls into question the worthiness of prescribing AD to those who are unlikely to use them and with increased emphasis on quality and safety; this has never been more paramount. Although the study has opened up the debate on whether to provide or not provide AD based on levels of cognition, there are many ethical and practical considerations to consider before they are dismissed. There would need to be more substantial, objective evidence, beyond the realms of this study, before this could confidently infiltrate clinical practice, but this study has opened the debate to challenge therapists’ current practice on AD provision.

The wider implications of this are also very clear and the benefits of cognitive evaluation in areas such as wound care, medication management and dietary management are evident ([Olsen-Keller and Strohschein, 2016](#)). Indeed, effective cognitive evaluation and patient training should pre-dominate all health interventions, particularly in the light of home interventions and the increasing desire to keep patients at home for longer.

The assessment tool was designed with core values of holism, function and independence in mind and does appear to be suitable to measure competencies in AD use. It must be stressed, however, that it is based on limited psychometric data and a limited sample size. There would need to be more work done on making the tool more responsive to change and cater for varying levels of competence. Despite this, the tool has proved very valuable to establish correlations with cognitive scores, which was the aim of the research.

Conclusion

Occupational therapy is a traditional rehabilitation profession and prides itself on the achievement of maximum potential for all its patients. The challenge for occupational therapy is not just in the prescriptive stages of AD provision, but also in the demonstration, teaching and follow up stages to help all patients achieve their full potential and benefit from AD. Patients with cognitive impairment pose a larger safety challenge but still should be afforded an opportunity to use and benefit from AD. There may come a point, however, when AD provision is not appropriate or safe for patients with significant cognitive impairment and occupational therapy must also face this challenge while still allowing them to achieve their full potential.

This may involve not just new and innovative ways of teaching, but also calls on therapists to go back to basic skills such as problem solving, activity analysis and client centred practice and virtues such as trust, time, understanding and practice. Although in the short-term this may be more costly and time-consuming, it may ultimately be a more cost effective and efficient way of delivering care and maintaining independence. This would also contribute in a positive way to accountability, evidence-based practice and patient centred care.

The research and assessment tool is a new and unique way of looking at the provision of AD, particularly when cognitive impairment is a factor. Although results and correlations are significant, this only really highlights the need for much larger research to follow.

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Appendix 1. Final assessment tool

Patient research number: _____

Date:

Assessment: A

B

Assistive dressing device used: Shoe horn

Sock aid

Helping hand

Score 1 for yes, zero for no.

	Yes	No
	1	0
1. Patient identifies device by name and use		
2. Patient demonstrates adequate safety awareness throughout the process		
3. Patient selects appropriate garment for the device		
4. Patient manipulates the device appropriately		
5. Patient follows all of the correct sequence for the use of the device.		
Refer to structured demonstration.		
(a) Shoe Horn		
5 (b) Sock Aid		

(continued)

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5 (c) Helping hand		
6. Patient successfully completes the task independently		
7. Patient successfully completes the task independently as demonstrated		
8. Patient safely and appropriately ties the device following use by returning it to its original position.		
9. Patient demonstrates an adequate awareness of the process by verbal expression of the success/failure		
10. Patient performs the task within 15 minutes		
	Total	

Signature of Researcher

Appendix 2: Assessment tool properties

Although the tool used in the study falls short of a complete standardised test defined by Finch *et al.* (2002) as a “published assessment tool that provides detailed instructions on administration and scoring and has published results of reliability and validity” (p. 78), the tool used has made a considerable contribution to such a test.

The reliability of the tool, both inter-rater and test re-test has been well proven with Cronbach’s alpha values of 0.927, 0.938 and 0.964, for all three ADs. This is above the value of 0.7, and indeed, 0.9 is used as a strong indicator of internal consistency in clinical studies (Holli *et al.*, 2007).

Despite this, it is important to consider that these values are based on a pilot study of fifteen patients. To deem the test truly reliable an increased sample size would be desirable. Brentnall and Bundy (2009) state that a larger sample size is statistically more reliable, and there is a need to provide more reliable data if the tool is to be used going forward.

In terms of validity, the tool does measure what it claims to measure and has content, construct and face validity based on significant work at its development stage. The concept of safety, which is well represented, probably needs further definition and objectivity in its scoring to augment content validity. Holli *et al.* (2007) describe innovative methods of qualifying content validity such as a content validity ratio, which would require extensive research and development, and which is beyond the realms of this study.

Responsiveness to change

Re-evaluation and retesting of an instrument is an important factor to establish baseline performance and identify responses to therapy or intervention. Although the tool has proven useful and decisive in establishing statistically significant differences in scores, clinically significant changes remain unclear and would need further work such as the minimal clinical important difference described by Haley and Fragala Pinkham (2006).

Following feedback from the research assistants, question five in the tool, which requires the standardised sequence of use, does not cater for different levels of competence. Despite some patients getting only one step or all steps in the sequence wrong, they are still awarded a zero. This effectively means that this particular item can be failed quite easily. The tool needs to cater for varying levels of competence within this item and be rewarded accordingly. This would bring in a more complex marking system and may not have been practical for the study, but would ultimately be more responsive to change for future use.

Clinical utility

Although the tool was designed and developed for the purpose of the study and despite its shortcomings, it must also be considered useful from both a clinical and practical viewpoint to use within occupational therapy practice. There are low costs involved, ease of administration and little extensive training required to administer successfully. The tool is ideal to use in both an acute hospital and in the home setting, where it could potentially be used with greater effect.

The tool is unique and although designed with three specific ADs in mind, the template could be tailored to suit other AD. There would obviously need to be significant work in terms of standardisation and provision of a manual before it could be used in the open occupational therapy market. Klein *et al.* (2008) states that occupational therapy needs measures that are not just psychometrically sound, but are also fundamental to the profession’s values and beliefs, and the assessment tool was designed with core values of holism, function and independence in mind.

Direct observation

The importance of direct observation, as a data source, was well highlighted in the methodology as part of the development of the tool. Direct observation of every ADL has been criticised, (Sonn *et al.*, 1999) because of all the time involved; however, the benefits in specific ADL tasks such as AD use are very clear. The assessment tool allows for accuracy, consistency, detection of unsafe methods, which was central to the study and specific areas which need further work.

The assessment tool does appear to be suitable to measure competencies in AD use; however, it must be stressed that it is based on limited psychometric data and a limited sample size. There would need to be further work in establishing subtle changes to make it more appealing clinically although from a study viewpoint has been more than adequate to establish correlations with cognitive scores, which was the fundamental aim of the research.

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