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Locating assistive technology research in a clinical setting: an occupational perspective

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Abstract. Peer research was used to identify the experience and perceptions of assistive technology and telecare adoption in a UK healthcare context. A narrative account of participation and learning is intended to provoke further dialogue. There have been a range of policy and implementation initiatives that are within the direct experience of organisational actors over the last 15 years and this engagement allows for specific reflection on the service achievements and some of the barriers to implementation of technology changes in rehabilitation practice and service design. Insights are presented that suggest a reification of research priorities and a need to align technology, through patient and public engagement, to provider priorities. In addition, an improvement in adoption would be based on sustained capacity building within the Occupational Therapy workforce and a re-focus on specific knowledge sharing and learning about technology. Given the shared desire to promote the sustained adoption of appropriate technology for assistance and rehabilitation it is suggested the voice of practitioners is strengthened through research and knowledge exchange in the clinical setting.

Keywords. Assistive technology, qualitative research, occupational therapy

1. Introduction

Occupational Therapists (OT's) aim to view people as occupational beings that are intrinsically active and creative and needing to engage in a balanced range of activities in their daily lives to sustain health and wellbeing [1]. The purpose of Occupational Therapy is to enable people to fulfil, or work towards fulfilling their potential as occupational beings. In order to participate in this range of meaningful activities, assistive technology can be utilised as an enabler to achieve a greater level of activity or in some cases independence. There is a symbiotic relationship between the potential of assistive technology and the philosophy of the OT Profession.

Given this symbiosis there are many examples of the selection and provision of assistive equipment in activities of daily living such as mobility, eating, drinking, and bathing and leisure activities by Occupational Therapists. The recent practice guideline for the prevention and management of falls from the College of OT [2] is explicit "*occupational therapists should offer service users who are living in the community advice, instruction and information on assistive devices as part of a home*

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hazard assessment". It is therefore curious that the scale and sustainability of adoption of newer and advanced healthcare technologies has been variable and in spite of several policy initiatives and investments in systems level deployment, there remains a gap between the aspiration and the actual use of technology in health services.

One example: the adoption of telecare within a single acute hospital setting has been low, despite the allocation and training of local 'champions' and a service designed to promote assessment and simplify provision. An assessment of the older person occurs to anticipate assistive devices that would enable a discharge from hospital care following an acute episode. Opportunities for technical demonstration to therapists, patients and carers have not resulted in increased referrals nor has it resulted in a take up of the wider range of telecare devices and sensors. This suggests that a number of barriers exist at micro systems level i.e. that the timing of this hospital based assessment is a 'poor fit' for the patients and carers.

Given an opportunity to increase sustainable research capacity in Occupational Therapy, afforded by a knowledge exchange initiative entitled CABOT the authors sought to undertake a retrospective review of the experiences of advancing and improving professional practice in relation to the adoption and deployment of assistive technology in a clinical context. The national, regional and local experiences of a healthcare manager and an academic project manager were reviewed. As Occupational Therapists, the purpose was to identify some of the barriers to adoption and deployment of assistive technology in rehabilitation, to consider barriers to scaling implementation and furthermore, to begin a debate about the way to equalise access to technological requirements of patients and carers.

2. Methodology

Peer research is a participative methodology that seeks to empower experts, practitioners and stakeholders to engage with a critical issue. The method is simple and conversation based. Peers interview each other and aim to expose their experience and share their 'data' with each-other so that comparison can be made to achieve learning and insight. Peer or participant corroboration within a programme of work can be used as a naturalistic enquiry [3] that should lead to a more sophisticated understanding of the factors that increase or decrease the likelihood of positive outcomes [4]. Within the peer conversations, it is imperative that dual roles are declared and acknowledged [5] so that respective context of the peer experience is evidenced.

A simple process was agreed between the peers, and a number of meetings arranged to coincide with the end of the CABOT (Collaboration Aiming at Building Occupational Therapy Research) project, to take advantage of the expertise offered by academic colleagues from the Centre for Assistive Technology and Connected Healthcare (CATCH). Both Occupational Therapy managers were currently working within a large teaching hospital where a wide diversity of specialist services exists but where the majority patient group could be regarded as frail and elderly. The colleagues shared an interest and involvement in a project to advance occupational therapy research in assistive technology. Their current roles, one in professional leadership and

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the other as a clinical academic and research development officer were based on prior experience of assistive technology and telecare implementation, engagement with national policy implementation, service delivery and re-design and curriculum development. The purpose of the peer research was; to achieve a shared analysis of the opportunities and barriers for research into assistive technology in rehabilitation and as a secondary objective, to achieve a strategic awareness that would lead to a more sustained deployment of technology in healthcare practice. Both researchers were actively involved with all stages of the research including data analysis and writing up for the purpose of publication.

A critical analysis of the combined experience was collated and discussed in order to build a reflexive perspective on the history of involvement in assistive technology projects. This was then shared as qualitative data with a third party to identify the opportunities and barriers and to validate the peer experience in relation to wider policy and practice drivers. A rapid review, using Google Scholar™ was used to support and to substantiate the findings and was based on the research question: How do Occupational Therapists understand the opportunities and barriers to research into assistive technology in rehabilitation? The results were sorted by relevance with references reviewed by title and abstract between 2010- 2014.

3. Results

3.1 Historical perspective

Over 15 years of management and academic practice in Occupational Therapy, peers identified a number of national and local policy, projects and research involvement that had influenced their practice and had led to service innovation in the NHS, acute and community services, occupational therapy curriculum changes at undergraduate and post graduate level, policy implementation programmes with partners in the 3rd sector (particularly involving users of assistive technology) and research projects.

These shared experiences were tabled and aimed to demonstrate an engagement with technology from an Occupational Therapy perspective; where values and opinions of Occupational Therapists had shaped the development and had led to further knowledge or skills. Table 1 summarises the timeline of participation, learning and development identified by peers.

Table 1. Peer review of engagement in the adoption and deployment of assistive technology research

Project	Type of participation	Date
Audit Commission Report- Fully Equipped [6]	Radical revisions to OT curriculum to support improvements in access to AT for disabled people based on integrated budgets	1997 onwards
Occupational Therapy Service Management- demonstrator site	Service re-design frustrated by limited procurement practices and poor inter-operability of telecare	2003 onwards
Preventative Technology Grant (PTG) [7]	Participation on the National Telecare Advisory Network to promote telecare through re-ablement	2004 onwards
DH/ College of OT Telecare promotion	National events across England to engage OT's in PTG- national speaker	2006 onwards

Trusted Assessor Programme commissioned project via Assist UK	National 3rd sector initiative to train trainers to deploy assistive technologies- new curriculum	2007
Re-ablement Knowledge Transfer Partnership (KTP) York City Council	Assistive technology used within service improvements designed to facilitate re-ablement services	2009 onwards
COBALT (Challenging Obstacles and Barriers to Assisted Living Technologies	Interviews and focus group of Occupational Therapists looking at facilitators and barriers to adoption of AT. Project had good PPI involvement but minimal knowledge exchange and practice changes.	2013onwards
Collaboration Aiming at Building Occupational Therapy Research - CABOT	Close scrutiny of Occupational Therapy priorities for innovation and design in technology innovation and research	2014-2015

3.2 Current Insights

The historical perspective was then complimented by a further discussion based on peers' current professional activity:

- a stakeholder analysis undertaken within one manager's doctoral study and
- a report on the roles of Occupational Therapists in public health.

This led to a further discussion about the ways that Occupational Therapists are currently engaged in the adoption of assistive technology and where barriers exist.

3.2.1 Stakeholder Analysis - Occupational Therapy with Frail Older People

A variation in the skills and behaviours of Occupational Therapists was noted by several stakeholders; based largely on the acceptance or reduction of risk. Factors associated with risk tolerance appeared to vary according to the working environment, the level of experience of the therapist and their relationship with members of the multi-disciplinary team. If there was a discrepancy in the approach to risk reduction then there will be consequential difference in the adoption and provision of assistive devices; uptake is dependent on a complex relationship between all stakeholders [8].

The utility and usability of technology is a key factor in Occupational Therapist's decision to deploy technology [9] and in a telecare example; provision requires a monthly cost per device and so acceptability to the patient and family influences adoption. This pragmatic consideration strongly influences patients and therapists with a primary need for efficacious, simple, and easy-to-use technology that could be individualised and motivate therapeutic choices [10]. For the older stakeholders there is some ambivalence about what they need and their familiarity with technology is another important variable. Stakeholders expect Occupational Therapists to know what assistive devices are available and for their approach to be inclusive and collaborative.

Assistive technology assessment and deployment must therefore be seen in the context of environmental adaptation and as a therapeutic intervention [11]; the means that Occupational Therapists use to facilitate the performance of everyday tasks with a disability, and this capability remains the core requirement as Occupational Therapists engage with designers and researchers to develop and innovate in a clinical and service context. Occupational Therapists are seeking to engage actively with advanced technology that enhances their ability and the patient's benefits (see Virtual Reality Interior Design Application [12] where patients can become more active and equal partners in deciding the technology they use in rehabilitation.)

3.2.2 Mapping Occupational Therapy Effectiveness to Public Health Outcomes

Research into the effectiveness and impact of Occupational Therapy has identified a public health contribution that has been hitherto under recognised as a population based intervention. Some key indicators with the Public Health Framework [13] demonstrate a need to promote the high user-satisfaction rates for aids and adaptation provision when these are provided in a timely way [14] and, to measure the impact and outcomes for a frail and older population as a key priority. According to NICE[1] guidelines for older people who have received treatment in hospital following a fall should be offered a home hazard assessment and safety intervention/modifications that include assistive technologies. NICE CG 161 also recommends a wide range of assessments/ interventions which fall within Occupational Therapy role and remit.

A number of studies reinforce the evidence for service effectiveness based on the impact of an OT Environmental assessment and modification to prevent falls [15]. Similarly, a randomised controlled study of 'Independence at Home Service' suggests a time limited intervention, to address all activity and participation needs through provision of assistive devices. The study is based on a three armed trial (238 total cohort: 78 in control, 78 received intervention from a trained assessor, 87 received intervention from an OT) with follow up at 3, 6, and 12 months[2]. The group receiving the intervention from OT had significantly fewer falls than the control group at 12 months follows up [16].

As the evidence for the effectiveness of assistive technology and the positive impact of its deployment is more widely acknowledged, so the interest and concern about patient use and the pathways to innovation and adoption are better resourced. This includes capacity and capability to engage in research.

3.3 Key findings

Reflexive processes can lead to greater awareness and understanding about the context for the adoption and deployment of assistive technology and the findings from the conversations and shared analysis can be summarised as follows:

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[1] *National Institute for Clinical Excellence*
[2] *The Westmead home safety assessment used to guide intervention, measurements for fear of falling, Falls QoL and ADLs taken*

- Reflection on different projects and membership of national policy suggested that a short term commitment to a large and complex agenda, allowed for only piecemeal progress.
- Investment (albeit large scale in some cases) and implementation planning has generally focused on technology and systems development rather than on systematic deployment or service development.
- Personal learning from research and service improvement initiatives has been important but was not always transferable to other projects and initiatives, although a focus on patient benefit has been essential.
- Project initiatives seldom lead to sustained organisational knowledge and sharing of insights through the Occupational Therapy workforce with the exception of undergraduate curriculum advances.
- Occupational Therapists have been regarded as 'gatekeepers' [13] to deployment of technology but have only recently been included as advocates for a patient's occupational need and wishes, and stakeholders in their own right.
- Occupational Therapists can be reserved about their potential role of technology specialists and this may be linked to the challenge of remaining up to date and knowledgeable in the face of new technology.
- Research and knowledge exchange involvement has allowed some Occupational Therapists to voice their perspectives and identify the provider role as a user of assistive technology.
- Technology innovation has focused largely on patient and family engagement in design and development and not on the wider leadership and systematic processes needed to deploy technology through services.
- Research is currently engaging and validating the efficacy of Occupational therapy as a partner in the development and scaling of assistive technology deployment and this is to be welcomed.

4. Discussion

The peer research was identified as a way of learning about the barriers to the wider and potential deployment of technology; particularly in the context of a project to advance the process of engagement between Occupational Therapists and technology academics and designers. For more than 15 years, these Occupational Therapy managers have engaged with policy directed initiatives that appear to have underachieved on the ambition, espoused by a range of policies, to achieve a systems level adoption of technology. Some of the barriers were identified in relation to short term funding and very local learning that did not generalise to other contexts and projects. In addition, as an Occupational Therapy workforce, there are limited opportunities and also some ambivalence, to a deeper engagement in systems level adoption of new technology.

The stakeholder activity provided some explanation of the need for Occupational Therapists to better express the values of the profession and a focus on occupation and achievement of daily activity that is much valued by patients and families. Occupational Therapists may need to contribute more to the strategic debate

about technology innovation, sharing their occupational perspective of disability and working more assertively with academics to promote user-centric design. A wider role for Occupational Therapists as clinical academics is being promoted by the UK National Institute of Health Research, to achieve a better stakeholder engagement and partnership between academics, users and carers and practitioners.

Capacity for provider services to engage as strategic partners in technology innovation and wide scale deployment is still under-developed. As the population needs of frail and older people become more complex there are limited opportunities for Occupational Therapists to participate in and lead research because of pressing service commitments. However, small pockets of engagement and some substantial evidence of effectiveness is helping to re-inforce the advice and partnership role that Occupational Therapists can play; leading to Occupational Therapists having a greater role in the development and innovation of assistive technology. Research and knowledge exchange initiatives (such as those mentioned in table 1) place emphasis on local, workforce familarisation and preparation for further assessment and adoption of assistive technology that is needed to build confidence and capacity in the Occupational therapy workforce.

A collaborative approach to successful adoption of assistive technology is currently being based on identifying technology needs within clinical Occupational Therapy services and an academic partner (CABOT). Taking this grounded approach; Occupational Therapists ideas have been aligned with research design expertise, alongside patient involvement. This approach has engaged the OT clinical staff to potentially generate new knowledge and be open to learning about existing technology solutions. In the experience of participating peers, there were few examples of an approach that brokered a provider perspective of assistive technology need and as a consequence the capacity within healthcare to track technology development has lagged behind both academic and technological partners.

5. Conclusions

A critical reflection of the management experience of working in technology and telecare projects, has led to a shared acknowledgement of barriers to its sustainable deployment across the healthcare systems. Key barriers to translation of assistive technologies into clinical practice are lack of knowledge, education, awareness and access. Reflection on projects in service design, curriculum and research, highlighted the need for more robust stakeholder engagement and an opportunity for Occupational Therapists to participate in a strategic way; that is grounded in the principle of technology supporting occupational outcomes and valued daily living activities.

As therapists and managers working across sectors and in a multidisciplinary context, there is a need to develop some 'translational competence'- including a confidence to speak about the quality of life of a given population and the reality of the workforce working in the practice context. An improvement in adoption would be based on sustained capacity building within the Occupational Therapy workforce and a re-focus on specific knowledge sharing and learning about new technology.

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In the light of the current UK policy landscape and the emphasis on public health priorities and innovation, it would seem timely to promote a shared strategic platform for implementing technology within provider services and evaluate the impact across populations of patients/users and associated professional workforces. Internationally, it would be useful to share an understanding and approaches to evolve best practice in Europe and indeed everywhere.

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