**Use of Therapy Outcome Measures (TOMs) and Australian Therapy Outcome Measures (AusTOMs) in Community Physiotherapy and Community Occupational Therapy Services: A Scoping Review**

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**Abstract (199 words)**

**Background:**

Outcome measures enable benchmarking within and between services, which is essential for ensuring best practice standards. There is limited consensus regarding which outcome measures should be utilised within the community. Therefore, the aim of this scoping review is to provide an overview on the Therapy Outcome Measures (TOMs) and Australian Therapy Outcome Measures (AusTOMs) in community physiotherapy and occupational therapy services whilst identifying any gaps that exist in the evidence base.

**Methods:**

A Scoping review was conducted as per PRISMA guidance. CINAHL, MEDLINE, EMBASE, EMCARE and PubMed were researched, and articles were screened based on pre-defined criteria. The results were themed for reporting.

**Results:**

13 studies included. Article themes were sensitivity, validity and reliability of the outcome measures and the use of the TOMs/AusTOMs in community settings.

**Conclusion:**

Both the TOMs and AusTOMs have been shown to be potentially valid and reliable tools for use in community therapy services. Different levels of improvement have been reported across services using either outcome measure. Future research should investigate the specific floor and ceiling effects of both measures within community populations. Additionally, comparing TOMs data with AusTOMs data could help identify whether one measure is more advantageous than the other in specific circumstances.

**Introduction**

The use of outcome measures is necessary to monitor the quality-of-service delivery and patient progress (Duncan & Murray, 2012); two things which are considered top research priorities (Chartered Society of Physiotherapy (CSP), 2018). Using outcome measures also allows benchmarking within and between services which is crucial to ensure that services are meeting the best practice standards (CSP, 2022). Barriers to the use of outcome measures include: the time taken to administer, and the cost associated with the use of the outcome measure (Duncan & Murray, 2012). Thus, for effective use in clinical practice an outcome measure needs to be both easy to administer and inexpensive.

**Rationale for this review:**

To the authors knowledge, there have been no reviews published on the use of the outcome measures used specifically in community physiotherapy and occupational therapy services. Currently, there are a broad range of outcome measures available for use within community therapy. However, many of the frequently used outcome measures such as the Barthel Index (Mahoney and Barthel, 1965) and Functional Independence Measure (Guide for the Uniform Data Set for Medical Rehabilitation, 1999) focus on only one area of patient health such as activity or disability (Unsworth, 2000), as such their ability to detect improvements in other areas may be limited. Other outcome measures that can be used to focus on more than one area of patient health such as the Goal Attainment Scale (Hurn et al., 2006) and the Canadian Occupational Performance Measure (COPM) (Carswell et al., 2004) have been time consuming in clinical practise (Colquhoun et al., 2010) or have been difficult to administer with cognitively impaired patients (Stolee at al., 2012). In addition, there are added costs associated with using these two outcome measures. The Euroquol-5D (EQ-5D) (Brooks, 1996), a patient reported outcome measure, does not take any measurement of patient impairment or participation (Unsworth, 2005), which again means it may miss any patient improvement that occurs in these areas.

**Therapy Outcome Measures:**

The Therapy Outcome Measures (TOMs) (Enderby and John, 2015; Enderby John and Petheram, 2006) was designed within the United Kingdom (UK) to align with the World Health Organisation’s (WHO) International Classification of Disability and Function (WHO, 2001), which outlines three domains of patient health: impairment, activity, and participation. In addition, Enderby (1992) suggested a fourth domain, which was of significance to measure, the domain of wellbeing/distress. Each of the four TOMs domains are rated a scale from 0-5 with zero indicating a high severity of difficulty experienced within a domain and 5 representing normal for the patients age, sex, and culture (Enderby, 1992). Patients can also be scored with half points, to increase the sensitivity of the measure (Enderby and John, 2015; John, 2011). Initially a core scale, which was non-condition specific, was established and then further scales were developed for different patient groups to improve decision making (Enderby and John, 2015). There are now 60 adapted TOMs scales currently in use; patients are rated on the four domains of health using a TOMs scale that best fits their pathology (Enderby and John, 2019).

**Australian Therapy Outcome Measures:**

The Australian Therapy Outcome Measures (AusTOMs) (Perry et al., 2004) was adapted from the TOMs. It maintains the use of the four domains of patient health and the same scoring system is present, however different scale headings were used, and the scale headings were divided into profession specific categories for occupational therapy (AusTOMs-OT), physiotherapy (AusTOMs-PT) and speech and language therapy (AusTOMs-SP). There are 12 AusTOMs-OT scales and 9 AusTOMs-PT scales. Though of note, it has been suggested that any professional can score a patient with AusTOMs using any of scales (Unsworth et al., 2015). Whilst the impairment and activity domains vary according to scale selected, the participation and wellbeing/distress domains are consistent across all scales (Unsworth et al., 2004).

**The importance of the TOMs/AusTOMs in community practice:**

There is an urgent need to collect information about outcomes of care so the effectiveness of intervention can be captured in real-world settings. Health care professionals have constant pressure to collect information on outcomes to prove that their services are valuable to the public. Collecting outcome measurements is complex, as individual goals can yield varied effects especially in the long term as this information is invaluable in-patient healthcare benefit. Both the TOMs and the AusTOMs are freely available and do not require a licence to use. Further to this, evidence has suggested that they are an easy outcome measure to use in clinical practice (Caldwell, Twelvetree and Cox, 2015), quick to administer and ratings are assigned only after the individual has been assessed and goals have been set or reassessed (Enderby and John, 2019; Unsworth et al., 2004). Though there are varying amounts of evidence to support both the use of the TOMs and the AusTOMs in different professional groups and different conditions, to date, there has not been a review which specifically looks at the evidence surrounding both the TOMs and the AusTOMs within community physiotherapy and community occupational therapy services. This is required as the population treated within community therapy services often have multiple pathologies (Caldwell, Twelvetree and Cox, 2015), therefore it is vital to establish that outcome measures are effective within this population specifically. A deeper knowledge and understanding of the evidence base will assist community clinicians in making an informed decision about what outcome measure is appropriate to use with their patient population.

The aim of this scoping review is to present an overview of the evidence base related to both outcome measures, including their application within community services and evaluation of psychometric properties in community populations. Additionally, it seeks to identify research gaps and propose future areas for research interest.

**Methods**

***Search Strategy:***

A search strategy was developed and reviewed and refined by a clinical librarian at Mersey and West Lancashire Teaching Hospitals NHS Trust. The literature search (contained in appendix one) was conducted in July 2023 in the following databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL) (via EBSCO platform), MEDLINE (via EBSCO platform), EMBASE (via OVID platform) EMCARE (via OVID platform) and PubMed. In addition, a lateral search of the literature was conducted where a manual review of the references of all relevant studies were undertaken to ensure no relevant research was missed.

The following terms and Boolean operators were searched in the title and abstract fields “Intermediate Care” or “Rehabilitation” or “Physiotherap\*” or “Physical Therap\*” or “Occupational therap\*” or “Home Based therap\*” or “Home care service\*” or “Community therap\*” and “Therapy outcome measure\*” or “TOMs” or “AusTOM\*” or “AusTOMs-OT” or “AusTOMs-PT”.

To ensure no other grey literature was missed a search of Google Scholar was also performed using the advanced “in title” settings and the phrase “therapy outcome measures in community physiotherapy or occupational therapy”. Results were sorted by relevance. Due to the large number of results obtained through Google scholar (8,480), the first 200 results searched revealed no additional relevant literature.

***Inclusion/Exclusion Criteria:***

All studies that investigated the use of the TOMs or AusTOMs in community physiotherapy or occupational therapy were included. For the purposes of this scoping review, community physiotherapy and community occupational therapy were defined as services delivering therapy. either within the patient’s home environment or within rehabilitation hospitals as these can also be considered as part of community rehabilitation (CSP, 2022). The search criteria for this review did not include any restrictions on publication date, however, case reports and conference presentations were excluded. Paediatric studies were excluded due to the significant difference between paediatric and adult therapy interventions. Due to time and funding constraints, articles published in languages other than English were excluded.

A decision was made to include studies where the outcome measure was investigated in other services in addition to community (e.g., acute services) to ensure that no relevant studies were excluded. However, studies that investigated the use of the outcome measure alone in these services without the addition of community services were excluded. As community therapy involves the treatment of people with multiple pathologies and co-morbidities, studies that investigated the use of the outcome measure in only clients with specific health conditions were excluded.

A table of all inclusion and exclusion criteria can be found in table 1 below**.**

|  |  |
| --- | --- |
| **Inclusion Criteria** | **Exclusion Criteria** |
| * Studies involving adult participants. * Articles published in English language. * Studies investigating the use of TOMs or AusTOMs in community settings. * Studies investigating community clinicians (occupational therapists or physiotherapists) or patients receiving services in community-based settings. * Studies which investigated a range of clinical conditions. * Studies where TOMs or AusTOMs scores are considered as one of the primary outcome measures and are a main feature of the study. | * Studies involving children. * Articles not written in English. * Studies that investigate the use of TOMS or AusTOMs only in a subset of patients that have been diagnosed with specific health conditions (for example investigated in stroke population or mental health population only). * Studies investigating a translated version of the TOMs/AusTOMs. * Studies investigating the use of TOMs or AusTOMs in the acute or outpatient setting alone. * Studies where TOMs or AusTOMs were used as secondary outcome measure only or where the TOMs/AusTOMs was not the main focus of the study. * Conference abstracts or case reports |

*Table 1 – Illustrates the list of full inclusion and exclusion criteria.*

***Study selection and Charting:***

A systematic search of the literature was conducted in July 2023 which revealed 297 unique titles following removal of duplicates. For the purposes of this scoping review Arskey and O’Malley’s framework (2005) was used as a guide. In addition, the Preferred Reporting Items for Systematic reviews and Meta-Analysis extension for scoping reviews (PRISMA-ScR) was followed (Tricco et al., 2018). A PRISMA diagram is presented in figure 1 below.

All identified studies were thoroughly screened for against the inclusion and exclusion criteria. For studies meeting the inclusion and exclusion criteria, the full text was obtained. In case where it was not clear from the abstract whether the study met the inclusion/exclusion criteria, the full text was obtained for review. Details of all included studies were then transferred to a table on Microsoft Excel that specified information on the Author, year of publication, type of study, study participants and aims of thestudy.

Considering the heterogeneity of the literature identified and the diverse focal points of the uncovered papers, conducting a systematic review would not be suitable for this literature review. A narrative review is undertaken instead allowing for a comprehensive study of the relevant literature. This approach will facilitate the synthesis of information and allow a cohesive exploration of the topic, ensuring a meaningful and comprehensive overview.

***Reporting the results***

Studies were grouped into categories depending on the study aim. The following categories were reported on;

* Reliability of the outcome measures: including inter-rater reliability, i.e. the degree of agreement between two individual raters, intra-rater reliability i.e. agreement between the same raters and test-retest reliability i.e. the consistency of measurements from the same subject for an outcome measure (Koo and Li, 2016).
* Validity of the outcome measures, including construct validity which shows whether two different outcomes are measuring similar constructs (Unsworth et al., 2004).
* Sensitivity of the outcome measures i.e. whether the outcome measure is able to detect change in patient condition over time (Unsworth, 2005) including the minimal clinically important difference (MCID); the minimum change that would be considered beneficial to the patient (Copay et al., 2007).
* use of the TOMs/AusTOMs in community settings.

**Identification of studies via other methods**

**Identification of studies via databases and registers**

Records identified from:

Websites (n = 0)

Organisations (n = 0)

Citation searching (n = 2)

Records removed *before screening*:

Duplicate records removed (n = 281)

Records identified from Databases: (n = 578)

**Identification**

Records screened

(n =297)

Records excluded

(n = 281)

Reports not retrieved

(n = 0)

Reports sought for retrieval

(n = 2)

Reports sought for retrieval

(n = 14)

Reports not retrieved

(n = 0)

**Screening**

Reports assessed for eligibility

(n = 2)

Reports excluded:

Investigated patients with one condition only (n =1)

Reports assessed for eligibility

(n = 14)

Reports excluded:

Unclear of therapist background (n = 1)

Unclear if patient population was limited to certain conditions (n = 1)

Studies included in review

(n = 13)

**Included**

Figure 1: PRISMA diagram, adapted from Page et al. (2020).

**Results**

***Description of Studies:***

Thirteen studies met the inclusion and exclusion criteria for this scoping review. A total of 297 papers were found from the database search of which 281were excluded from review of the title/abstract due to not meeting the criteria. Full text articles were obtained for 16 studies, a further3were excluded due to not meeting the criteria.

All studies included were either from the UK or Australia. Year of publication ranged from 1995-2022. The study themes and aims varied. The themes raised were demonstrating the use of TOMs or AusTOMs in community services and investigating aspects of validity, reliability, and sensitivity. A complete description of the included studies is provided in Table 2 below.

***Use of the TOMs/AusTOMs in community settings:***

Seven studies investigated the use of TOMs or AusTOMs in community settings. Four studies reported on the TOMs and three on the AusTOMs.

During the development of TOMs, Enderby and Kew (1995) conducted a pilot study on community and neurological physiotherapists investigating the improvement in TOMs score which were dependent on patient condition. They found that improvement in certain domains differed depending on patient condition, though analysis of whether these differences were significant was not performed in this study.

In their secondary analysis, Ariss et al. (2015) reviewed improvements in TOMs score across intermediate care teams. On average 43% of patients improved in the impairment domain, 44% in the activity domain, 37% in the participation domain and 32% in the wellbeing domain. The level of improvement appeared to decline with age and females were more likely to show an improved score. In addition, a lower TOMs score on admission was associated with a greater improvement in TOMs score. Patients were more likely to improve their TOMs score if they were referred from acute settings; living at home was also found to be associated with greater improvements in TOMs score. Half of all patients did not improve in any TOMs domain.

Caldwell, Twelvetree and Cox (2015) investigated the use of TOMs in a community rehabilitation team. Data was available on 26 patients who were admitted and discharged from the team. Nineteen patients improved by 1 point or more in one or more TOMs domain. The largest improvement was seen in the participation domain whereas the least improvement was seen in the wellbeing domain. Ten different TOMs scales were used, with the core scale being the most often utilised.

Davenport (2021) examined the use of the TOMs in an adult social care occupational therapy service, which provided a short-term assessment, major adaptations and a reablement service. 94% of patients showed improvement by 0.5 or more in at least one TOMs domain. The impairment domain showed the least improvement with only 2 out of 70 patients demonstrating improvement. The activity domain showed the most improvement with 55 out of 70 patients showing improvement. Nine different scales were used with multifactorial being the most utilised scale.

In a home-based therapy service, Abu-Awad et al. (2014) investigated the number of client improvement in the participation restriction domain with use of the AusTOMs-OT. Data on 506 patients were analysed; 48.9% of patients improved with the rest showing no change in score. No patients were reported to have deteriorated.

Alderdice et al. (2022) explored the use of the AusTOMs-OT in an occupational therapy service which provided therapy to the homeless. Data from 58 patients was analysed using three scales: transfers, self-care, and domestic life-home. The greatest improvement was in the activity limitation and participation restriction domains (ranged from 86-91% improvement), 77% of patients improved in the wellbeing/distress domain and the lowest level of improvement was seen in the impairment domain.

Smith and Fields (2020) examined the change in AusTOMs-OT scores after participation in a transition care program, which is a service available in Australia providing support to patients who having been discharged from hospital to a residential or community setting (Australian Government, 2023). The service involves support from a wide range of members in the multi-disciplinary team including physiotherapy and occupational therapy. Data was analysed from 110 participants. The most frequently used scale was self-care (used in 69.1% of cases), followed by functional walking and mobility (used in 61.8% of cases). Further data analysis was conducted on the five most used scales (self-care, upper limb use, functional walking and mobility, domestic life – home and community life/recreation/leisure/play) along with the global participation restriction and wellbeing/distress domains. There was a statistically significant improvement in scores from admission to discharge in all scales analysed. Across all scales, improvement was higher in the activity limitation domain over the impairment domain. Data on the MCID showed that the lowest percentage of patients demonstrating a MCID was in the wellbeing domain, in which only 43% of patients demonstrated a MCID.

***Reliability of the outcome measures***:

Three studies reported on the reliability of the TOMs or AusTOMs with reference to community settings, one reported on the TOMs and two reported on the AusTOMs.

In their 2006 book; Enderby, John and Petheram present data from the original TOMs reliability trials conducted between 1993 and 1999; the results of these trials are reported only in their book. One hundred and forty-eight physiotherapists, occupational therapists and rehabilitation nurses from 11 different NHS services each rated 10 case studies from their previous caseloads. Twenty-eight trials were conducted, some of these were repeats due to low inter-rater class coefficients (ICCs) in the first trials. Overall, results varied, the domain of impairment was the most consistent with only two trials showing an ICC below 0.6. Twenty of the trials showed moderate to high reliability across all four domains. Where ICCs where initially low, the team participated in training and then a repeat trial was completed which improved the inter-rater reliability.

Morris et al. (2005) reviewed the inter-rater and test-retest reliability of the AusTOMs (PT, OT and SP scales). Results reported in this review focus on the OT and PT scales. Forty-one physiotherapists and 53 occupational therapists across a range of specialties including community services were recruited and reliability was assessed using case vignettes. The authors proposed that an 80% agreement between raters was adequate for demonstrating reliability, other statistical methods such as ICCs and Kappa statistics could not be reported on. For the AusTOMs-PT, for inter-rater reliability only the urinary and bowel continence scale was able to demonstrate an 80% agreement across all four domains, though most scales were able to demonstrate an 80% agreement in at least one domain. For test-retest reliability, there was a large degree of variability with some scales demonstrating high levels of agreement but other demonstrating lower levels of agreement. For the AusTOMs-OT, high levels of agreement for inter-rater reliability were obtained for 2 scales across all 4 domains; upper limb use and carrying out daily life tasks and routine. Test-retest reliability showed high levels of agreement in 8 of the scales for the impairment domain with more variability in the activity limitation, participation restriction and wellbeing/distress domains.

Unsworth, Timmer and Wales (2018) reported on the inter-rater, intra-rater and test-retest reliability of the AusTOMs-OT scales. Twenty-eight occupational therapists from a range of specialities including community services were recruited and reliability was examined using written case studies. The participation restriction and wellbeing/distress domain ICCs showed high levels of inter-rater reliability, and the impairment and activity limitation domain ICCs showed moderate to high levels of inter-rater reliability, with ICCs ranging from 0.531-0.922. Inter-rater reliability was lowest in the impairment domain. Intra-rater reliability was found to be moderate to high (ICCs ranging from 0.675 to 1000). For test-retest reliability, participation restriction and wellbeing/distress domains demonstrated high to very high reliability, including impairment and activity limitation scales which showed moderate to very high reliability.

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| --- | --- | --- | --- | --- | --- | --- |
| **Author (year of publication) and study country** | **Sample Size** | **Study design type** | **TOMs or AusTOMs used** | **Study participants and therapy settings** | **Aims of Study** | **Main findings** |
| Alderdice et al. (2022), UK | 58 patients | Service evaluation | AusTOMs | Patients from one community-based service of OTs working with homeless people. | To illustrate how an appropriate outcome measure was chosen for the service and determine the changes in patients using the outcome measure. | - 86% of patients improved (by at least one point or more) in the activity domain.  - 91% in the participation domain.  - 77% in the wellbeing domain. |
| Davenport (2021), UK | 70 patients | Audit | TOMs | Patients receiving occupational therapy from one team of adult social care OTs. | To demonstrate the outcomes of the adult social care OT team using the TOMs. | 93% of patients showed an improvement in score (by 0.5 points or more) in at least one TOMs domain. |
| Smith and Fields (2020), Australia | 110 patients | Retrospective clinical audit | AusTOMs-OT | Patients admitted to one transition care program receiving occupational therapy. | To investigate how admission to a Transition Care Program impacts on AusTOMs-OT score. | Patients made statistically significant and clinically significant (defined as a 1 point or more increase in any domain) improvements in AusTOMs score. |
| Unsworth, Timmer and Wales (2018), Australia (+ OTs from UK and republic of Ireland) | 31 OTs | Reliability study using case vignettes | AusTOMs-OT | OTs from a range of specialities including rehabilitation and community services. | To examine the reliability of the 12 AusTOM-OT scales. | Inter-rater reliability was found to be moderate to very high for all scales. Intra-rater reliability was found to be moderate to high for all scales. |
| Ariss et al. (2015), UK | 8070 patients | Secondary analysis of retrospective data | TOMs | Patients receiving therapy from 32 community-based intermediate care settings. | To examine who is likely to benefit from intermediate care. | 50% of all patients demonstrated improvement in at least one TOMs domain by 0.5 points or more. TOMs were reported to be valid for use in intermediate care. |
| Caldwell, Twelvetree and Cox (2015), UK | 26 patients | Action research | TOMs | Patients receiving therapy from one community rehabilitation team. | To investigate the practicality of utilising the TOMs in a community rehabilitation team | 73% of participants improved their TOMs score by one point or more in a least one domain. |
| Unsworth et al. (2015), Australia (+ survey of international clinicians) | 30 clinicians, 787 patients | Survey + prospective observational study | AusTOMs-OT | OTs, PT, SLT and social workers from a range of specialities including community therapy. Patients from one home-based therapy service in Australia. | To investigate the minimal clinically important difference of the AusTOMs-OT using criterion and distribution-based approaches. | A change of 0.51-1 point demonstrated clinical significance, recommended that a change of 1 point in any domain should be considered as clinically significant. |
| Abu-Awad et al. (2014), Australia | 787 patients | Retrospective analysis | AusTOMs-OT | Patients receiving occupational therapy from 3 community therapy settings. | To examine whether patients improved as measured by Aus-TOMs-OT in the participation domain. | 48.9% of patients improved in the domain of participation |
| Morris et al. (2005), Australia | 41 PT, 53 OTs, 56 SLT | Reliability study using case vignettes | AusTOMs (OT, PT and SLT) | OTs, PTs and SLT from a range of different settings including community and rehabilitation. | To determine the reliability of the AusTOMs (OT, PT and SLT). | Satisfactory inter-rater reliability was observed for most scales. Satisfactory test-retest reliability was observed across all professions. |
| Unsworth (2005), Australia | 466 patients | Prospective observational study | AusTOMs-OT | Patients receiving occupational therapy from 12 occupational therapy services with a range of specialities including community therapy. | To investigate whether the scales of the AusTOMs-OT are sensitive to detecting change. | All 12 AusTOMs-OT scales showed the ability to detect statistically significant change over time in patients (in the region of a one-point shift in each domain). |
| Unsworth et al. (2004), Australia | 38 OTs, 30 PTs, 47 SLT | Prospective longitudinal cohort study | AusTOMs (OT, PT and SLT) | OTs, PTs, SLT and patients from a range of different settings including community facilities. | To examine the construct validity of the AusTOMs (OT, PT and SLT). | AusTOMs was compared against EuroQuol-5D and overall, both outcome measures were shown to be measuring similar constructs. |
| Enderby and Kew (1995), UK | 17 patients | Pilot study | TOMs | PTs from community and neuro disciplines. | To investigate whether there is a change in TOMs score in different patient groups. | Patients with different conditions showed varied rates of improvement in each of the four domains. |
| Enderby, John and Petheram (excerpt from 2006 book -original data gained between 1993-1999), UK | 148 OTs/PTs and RNs over 28 trials. Individual trial sample sizes ranged from 2-11. | Reliability study using case histories | TOMs | OTs/PTs and RNs from 11 different NHS services including community and rehabilitation services. | To examine the inter reliability of the TOMs. | Inter-class correlations were variable between teams, but the overall trend showed moderate - high inter-rater reliability. |

*table 2: summary of papers included OT = Occupational Therapist, PT = Physiotherapist, SLT = Speech and Language Therapy, RN = Rehabilitation Nurse.*

***Validity of the outcome measures:***

Two studies reported on the validity of the TOMs or AusTOMs with reference to community services; one reported on the AusTOMs and the other on the TOMs. Since there is no gold-standard technique in evaluating TOMs or AusTOMs against (Enderby and John, 2015; Unsworth 2004), the studies have compared the scores against other measures such as the EuroQoL-5D (EQ-5D) and Levels of Care (LoC).

In a secondary analysis, Ariss et al. (2015) found that there were relationships observed between TOMs and LoC scores. They found that those with LoC scores of 0 were less likely to improve in any domain of the TOMs, whilst those with LoC scores of 3,4 or 5 were more likely to improve their TOMs scores. The authors concluded that TOMs are a valid outcome measure to use in community intermediate care teams, however, they were not specific in terms of defining what type of validity had been measured in this study.

Unsworth et al. (2004) investigated the construct validity of the AusTOMs (PT, OT and SP scales). Results that were reported in this review focus on the OT and PT scales. Thirty-eight occupational therapists and 30 physiotherapists were recruited from a range of specialities including community services, EQ-5D ratings were obtained from patients and therapists rated the same patients via a selection of AusTOMs scales. The results showed correlations between the EQ-5D scores and AusTOMs scores, for admission, discharge and changes in scores. The exception was the AusTOMs-OT wellbeing/distress domain, which did not demonstrate a statistically significant correlation with the EQ-5D score. Of note, data analysis was performed on only a subset of the most frequently used scales for both the AusTOMs-PT and AusTOM-OT.

***Sensitivity of the outcome measures:***

Two papers reported on the sensitivity of the AusTOMs with reference to its use in community services. Unsworth (2005) investigated the sensitivity of the AusTOMs-OT scaled in 466 patients from 12 occupational therapy services, including community services. There was a statistically significant change in patient scores over time in each of the 12 scales for each of the four domains.

Unsworth et al. (2015) investigated the minimal clinically important difference (MCID) of the AusTOMs-OT. Criterion determined MCID was obtained through a survey of 30 clinicians (including those who worked in community services) and distribution determined MCID was obtained through analysis of AusTOMs data from patients seen in a home-based therapy service in Australia. For the activity limitation, participation restriction and wellbeing/distress domains, over 50% of clinicians felt that a 1-point change signified a MCID. For the impairment domain, results were varied with some clinicians indicating that a 0.5-point change signified a MCID and a similar amount indicating that a 1-point change signified a MCID. For distribution based MCID, data was analysed on three OT scales (functional walking and mobility, transfers and self-care), in which half standard deviations were used to calculate the MCID which resulted in resulting indicating that the MCID for all domains was between 0.5-0.61. The authors suggested, for simplicity in clinical practice, a 1-point change across all domains to be used for the MCID.

**Discussion**

This scoping review was completed to summarise the evidence surrounding the use of the TOMs and the AusTOMs within community physiotherapy and occupational therapy services in the aims to provide knowledge of the gaps that exist in the evidence base. This was all done in order to assist community clinicians with selecting an appropriate outcome measure to use in clinical practice.

Both the TOMs and the AusTOMs appear to have been used successfully in several different therapy teams, though outcomes varied between teams, with some showing very high levels of improvement in scores (Alderdice et al., 2022 Davenport, 2021), some showing moderate to high improvement in scores (Caldwell, Twelvetree and Cox, 2015) and others showing lower levels of improvement (Abu-Awad et al., 2014; Ariss et al., 2015). There could be many reasons for these differences such as the sample size used in the studies or inherent differences within teams analysed; for example, some teams may have had longer referral to treatment times or stringent referral criteria which may have impacted on improvement. However, one reason for the difference may also be linked to what is considered an improvement in TOMs score. For the TOMs, different papers use different criteria for defining improvement. For example, Caldwell, Twelvetree and Cox (2015) use a difference of one point or more in any domain, whilst Davenport (2021) uses a difference of 0.5 or more to define improvement.

There is a distinct difference between what is classed as a statistically significant improvement and what is clinically meaningful for the patient. Enderby and John (2019) suggest that a change of 0.5 or more be considered as clinically meaningful, whilst other speech and language therapy studies have also used this to denote clinical significance (Palmer et al., 2019). However, no study has formally investigated the MCID within community physiotherapy and occupational therapy settings. For the AusTOMs the MCID has been reported to be close to a 1-point change within each of the domains (Unsworth et al. 2015) and it has been found that the measurement error is close to 0.5 (Unsworth, Timmer and Wales, 2018), therefore a 1-point change would be needed to indicate that the change is not due to measurement error.

Consideration must also be given to the fact that patients who are referred to community teams often have multifactorial issues, some of which may not improve, and it has been suggested that no deterioration in scores could be seen as a good outcome (Ariss et al., 2015). However, there may also be floor and ceiling effects to take into consideration and whilst there has been shown to be a correlation between lower TOMs score on admission and improvement gained (Ariss et al. 2015), the specific floor and ceiling effects of the TOMs and AusTOMs have yet to be investigated in relation to community services.

Both the TOMs and the AusTOMs have been reported to be valid and reliable for use in community teams (Ariss et al., 2015; Enderby and John, 2015; Unsworth et al., 2015; Unsworth et al., 2004). In terms of validity, it should be noted there is no gold measure to compare the TOMs or AusTOMs against (Enderby and John, 2015, Unsworth et al., 2004), thus this prevents criterion validity from being measured. Face and content validity are stated to have been assessed by a panel of experts for both the TOMs (Enderby and John, 2015) and the AusTOMs (Perry et al., 2004) however in both cases, it is unclear whether community clinicians were involved. Further evidence of construct validity has been obtained for the AusTOMs (Unsworth et al., 2004). For the TOMs, Ariss et al. (2015) states that the correlation between LoC scores and TOMs scores is further evidence for the validity of the TOMs, though they are not specific as to which type of validity has been measured through this, it is likely that this is further evidence of construct validity.

In terms of reliability, the TOMs have been reported to show moderate to high inter-rater reliability (Enderby, John and Petheram, 2006), however no studies could be found that investigated intra-rater reliability in community physiotherapists and occupational therapists. The AusTOMs have been reported to demonstrate moderate to high inter and intra-rater reliability and moderate to very high test-retest reliability, in which the results were varying across the different domains (Unsworth, Timmer and Wales, 2018).

In terms of sensitivity, only the AusTOMs appears to have been investigated within community therapy services with Unsworth (2005), reporting a statistically significant change over time. No studies could be found that investigated the sensitivity of the TOMs within the community population.

Whilst the TOMs and AusTOMs do have some inherent differences, the AusTOMs was developed from the TOMs and has retained the same scoring system and headings to allow for comparison (Unsworth, 2005), yet no study has compared the TOMs with the AusTOMs. The TOMs are condition based which does present some challenges in relation to community services due to the number of patients referred to community therapy with additional co-morbidities, or that were referred to community therapy for reasons not related to their main condition. The AusTOMs-OT is goal orientated and the difference between the two could impact on patient outcome. It could be argued that in previous research (Caldwell, Twelvetree and Cox, 2015; Davenport, 2021) community clinicians would use the multifactorial or core TOMs scales as these are not condition specific, however without comparison it is impossible to deduce whether one outcome measure would serve better over the other for community services. Whilst AusTOMs was initially created for use in Australia as it was felt that the TOMs were not appropriate due to differences in professional culture (Perry et al., 2004), the AusTOMs has since been utilised within other countries (Alderdice et al., 2022; Unsworth, Timmer and Wales,2018; Unsworth et al., 2015).

***Suggestions for future research:***

Future studies could investigate the MCID for the TOMs, which look at sensitivity and intra-rater reliability in the community settings for the TOMs, and they could also examine the floor and ceiling effects of the TOMs or AusTOMs, whilst potentially looking to compare the TOMs and AusTOMs in a community setting. Additionally, whilst there is a breadth of evidence that utilises the AusTOMs-OT scales in community services, no study could be found investigating the use of the AusTOMs-PT scales in community services (with the exception of the validity and reliability studies). Future studies could review whether the AusTOMs-PT scales are suitable for use within community physiotherapy and occupational therapy services.

***Limitations:***

All studies included in this review were published in the UK or Australia, as such, some results may not be generalisable to other countries with different healthcare systems. Due to the heterogeneity of the literature, quality assessment was not conducted as part of this review, thus, inferences regarding the quality of data included cannot be made. Additionally, a large majority of the literature referred to in this review is dated, and although the data is still relevant, further recent research is required.

***Conclusion:***

There is a range of evidence that shows that both the TOMs and AusTOMs can be successfully used in community physiotherapy and community occupational therapy services. Both have been shown to be potentially valid and reliable for use within these services. The two outcome measures are inexpensive and have been reported to be easy to use, which further supports their use in community services. However, more recent research is required. Specifically, data is needed on floor and ceiling effects of the outcome measures in relation to community services as well as data that compares the TOMs and AusTOMs to determine whether there may be an advantage in using one over the other in specific teams or circumstances.

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**Declaration of interest**

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**References**

Abu-Awad, Y., Unsworth, C.A., Coulson, M. and Sarigiannis, M. (2014) ‘Using the Australian Therapy Outcome Measures for Occupational Therapy (AusTOMs-OT) to measure client participation outcomes’, *British Journal of Occupational Therapy*, 77(2), pp.44-49. doi: [10.4276/030802214X13916969446958](http://dx.doi.org/10.4276/030802214X13916969446958).

Alderdice, E., Wolfe, D., Timmer, A.J. and Unsworth, C.A. (2022) ‘Use of the AusTOMs-OT to record outcomes in an occupational therapy homeless service’, *British Journal of Occupational Therapy*, 85(1), pp. 669-676. doi: [10.1177/03080226211067427](http://dx.doi.org/10.1177/03080226211067427).

Ariss, S.M., Enderby, P., Smith, T., Nancarrow, S.A., Bradburn, M.J., Harrop, D., Parker, S.G., McDonnell, A., Dixon, S., Ryan, T., Hayman, A. and Campbell, M. (2015) ‘Secondary analysis and literature review of community rehabilitation and intermediate care: an information resource’, *Health and Social Care Delivery Research*, 3(1). doi: [10.3310/hsdr03010](http://dx.doi.org/10.3310/hsdr03010).

Arksey, H. and O’Malley, L. (2005) ‘Scoping studies; towards a methodological framework’, *International Journal of Social Research Methodology: Theory and Practice*, 8(1), pp. 19-32. doi: [10.1080/1364557032000119616](http://dx.doi.org/10.1080/1364557032000119616).

Australian Government (2023) *Transition Care Program*. Available at: <https://www.health.gov.au/our-work/transition-care-programme> (Accessed August 2023).

Brooks, P. (1996) ‘EuroQol: the current state of play’, *Health Policy*, 37(1), pp. 53-72. doi: 10.1016/0168-8510(96)00822-6.

Caldwell C., Twelvetree T. and Cox D. (2015) ‘An evaluation of Therapy Outcome Measures (TOMs) in community rehabilitation’, *International Journal of Therapy and Rehabilitation*, 22(7), pp. 310-319. doi: [10.12968/ijtr.2015.22.7.310](http://dx.doi.org/10.12968/ijtr.2015.22.7.310).

Carswell A., McColl, M.A., Baptiste, S., Law, M., Polatajko, H. and Pollock, N. (2004) ‘The Canadian occupational performance measure: a research and clinical literature review’, *Canadian Journal of Occupational Therapy*, 71(4), pp. 210-22. doi: 10.1177/000841740407100406.

Chartered Society of Physiotherapy (2018) *Discovering physiotherapy research priorities that matter to patients, carers and clinicians* [Online]. Available at chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.csp.org.uk/system/files/documents/2018-11/001566%20Discovering%20Research%20Priorities%20-%20Final%20Report.pdf.

Chartered Society of Physiotherapy (2022) *Community rehabilitation best practice standards* [Online]. Available at chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.csp.org.uk/system/files/publication\_files/Rehab%20on%20Track\_Community%20Standards\_ENG\_FINAL.pdf.

Colquhoun, H., Letts, L., Law, M., Macdermid, J. and Edwards, M. (2010) ‘Feasibility of the Canadian occupational performance measure for routine use’, *British Journal of Occupational Therapy*, 73(2), pp. 48-54. doi: [10.4276/030802210X12658062793726](http://dx.doi.org/10.4276/030802210X12658062793726).

Copay, A.G., Subach, B.R., Glassman, S.D., Polly, D.W. and Schuler, T.C. (2007) ‘Understanding the minimum clinically important difference: a review of concepts and methods’, *Spine Journal*, 7(5), pp. 541-546. doi: 10.1016/j.spinee.2007.01.008.

Koo, T.K. and Li, M.Y. (2016) ‘A guideline of selecting and reporting interclass correlation coefficients for reliability research’, *Journal of Chiropractic Medicine*, 15(2), pp. 155-163. doi: 10.1016/j.jcm.2016.02.012.

Davenport, S.J. (2021) ‘Impact of occupational therapy in an integrated adult social care service: audit of therapy outcome measure findings’, *Journal of Integrated Care*, 29(4), pp.439-451. doi: [10.1108/JICA-04-2021-0020](http://dx.doi.org/10.1108/JICA-04-2021-0020).

Duncan, E.A.S. and Murray, J. (2012) ‘The barriers and facilitators to routine outcome measurement by allied health professionals in practice; a systematic review’, *BMC Health Services Research,* 12(1). doi: 10.1186/1472-6963-12-96.

Enderby P. (1992) ‘Outcome measures in speech therapy: Impairment, Disability, Handicap, and Distress’, *Health Trends*, 24(2), pp. 61-64.

Enderby, P. and Kew. E. (1995) ‘Outcome measurement in physiotherapy using the World Health Organisation’s classification of impairment, disability and handicap: a pilot study’, *Physiotherapy*, 81(4), pp. 177-180. doi: 10.1016/S0031-9406(05)67093-9.

Enderby, P., John, A. and Petheram, B. (2006) *Therapy outcome measures for rehabilitation professionals: speech and language therapy, physiotherapy, occupational therapy, rehabilitation nursing & hearing therapists*, 2nd edn., UK: John Wiley & Sons Ltd.

Enderby, P. and John, A. (2015) *Therapy outcome measures for rehabilitation professionals*, 3rd edn., UK: J&R Press.

Enderby, P. and John, A. (2019) *Therapy Outcome Measure User Guide*, Croydon UK: J & R Press.

Enderby P. & John A. (2020) Therapy Outcome Measure Theoretical Underpinning and Case Studies published by J&R. Press Croydon UK

Guide for the Uniform Data Set for Medical Rehabilitation *Adult FIMSM*(1999). Version 5.0, Buffalo, NY: State University of New York at Buffalo.

Hurn, J., Kneebone, I. and Cropley, M. (2006) ‘Goal setting as an outcome measure: A systematic review’, *Clinical Rehabilitation*, 20(9), pp.756-772. doi: 10.1177/026925506070793.

John A. (2011) ‘Therapy outcome measures: where are we now?’, *International Journal of Speech-Language Pathology*, 13(1), pp. 36-42. doi: 10.3109/17549507.2010.497562.

Mahoney, F. and Barthel, D. (1965) ‘Functional evaluation: the Barthel Index’, *Maryland State Medical Journal*, 14, pp.61-65.

Morris, M., Perry, A., Unsworth, C., Steat J., Taylor, N., Dodd, K., Duncombe, D. and Duckett, S. (2005) ‘Reliability of the Australian Therapy Outcome Measures for quantifying disability and health’, *International Journal of Therapy and Rehabilitation*, 12(8). doi:[10.12968/ijtr.20059.12.8.19536](http://dx.doi.org/10.12968/ijtr.2005.12.8.19536).

Page, M.J., McKenzie, J.E., Bossuyt, P.M., Boutron, I., Hoffmann, T.C., Mulrow, C.D. Shamseer, L., Tetzlaff, J.M., Akl, E.A., Brennan, S.E., Chou, R., Glanville, J., Grimshaw, J.M., Hrobjartsson, A., Lalu, M.M., Li, T., Loder, E.W., Mayo-Wilson, E., McDonald, S., McGuinness, L.A., Stewart, L.A., Thomas, J., Tricco, A.C., Welch, V.A., Whiting, P. and Moher, D. (2021).’ The PRISMA 2020 statement: an updated guideline for reporting systematic reviews’, *BMJ*, 372(71). doi: 10.1136/bmj.n71.

Palmer, R., Dimairo, M., Cooper, C., Enderby, P., Brady, M., Bowen, A., Latimer, N., Julious, S., Cross, E., Alshreef, A., Harrison, M., Bradley, E., Witts, H. and Chater, T. ‘Self-managed, computerised therapy for patients with chronic aphasia post stroke compared with usual care or attention control (Big CACTUS): a multicentre, single blinded, randomised controlled trial’, *The Lancet* *Neurology*, 18(9), pp.821-833. doi: 10.1016/S1474-4422(19)30192-9.

Perry A., Morris M., Unsworth C., Duckett S., Skeat J., Dodd K., Taylor N., and Reilly K. (2004) *‘*Therapy outcome measures for allied health practitioners in Australia: the AusTOMs’, International *Journal for Quality in Health Care*, *16*(4), pp.285-291. doi: [10.1093/intqhc/mzh059](https://doi.org/10.1093/intqhc/mzh059).

Smith, H.N. and Fields, S.M. (2020) ‘Changes in older adults’ impairment, activity, participation and wellbeing as measured by the AusTOMs following participation in a transition care program’, *Australian Occupational Therapy Journal*, 67(346), pp. 517-527. doi: [10.1111/1440-1630.12667](http://dx.doi.org/10.1111/1440-1630.12667).

Stolee, P., Awad, M., Byrne, K., Deforge, R., Clements, S., Glenny, C.; Day Hospital Goal Attainment Scaling Interest Group of the Regional Geriatric Programs of Ontario (2012) ‘A multi-site study of the feasibility and clinical utility of gals attainment scaling in geriatric day hospitals’, *Disability and Rehabilitation*, 34(20), pp. 1716-1726. doi: 10.3109/09638288.2012.660600.

Tricco, A., Lillie, E., Zarin, W., O.Brien, K.K., Colquhoun, H., Levac, D., Moher, D., Peters, M.D.J., Horsley, T., Weeks, L., Hempel, S., Akl, E.A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M.G., Garritty, C, Lewin, S., Godfrey, C.M., Macdonald, M.T., Langlois, E.V., Soares-Weiser, K., Moriarty, J., Clifford, T., Tuncalp, O. and Straus, S.E. (2018) ‘PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation’, *Annals of Internal Medicine*, 169(7), pp. 467-473. doi: [10.7326/M18-0850.](http://annals.org/aim/fullarticle/2700389/prisma-extension-scoping-reviews-prisma-scr-checklist-explanation)

Unsworth, C. (2000) ‘Measuring the outcome of occupational therapy: tools and resources’, *Australian Journal of Occupational Therapy*, 47(4), pp. 147-158. doi: 10.1046/j.1440-1630.2000.00239.x.

Unsworth, C.A., Duckett, S.J., Duncombe, D., Perry, A., Skeat, J. and Taylor, N. (2004) ‘Validity of the AusTOMs scales: a comparison of the AusTOMs and EuroQol-5D’, *Health and Quality of Life Outcomes* 2(1), pp. 64-75. doi: [10.1186/1477-7525-2-64](https://doi.org/10.1186/1477-7525-2-64).

Unsworth, C.A. (2005) ‘Measuring outcomes using the Australian Therapy Outcome Measures for Occupational Therapy (AusTOMs-OT): data description and tool sensitivity’, *British Journal of Occupational Therapy*, 68(8), pp.354-366. doi: [10.1177/030802260506800804](http://dx.doi.org/10.1177/030802260506800804).

Unsworth, C.A., Coulson, M., Swinton, L., Cole, H. and Sarigiannis, M. (2015) ‘Determination of the minimal clinically important difference on the Australian Therapy Outcome Measures for Occupational Therapy (AusTOMs-OT)’, *Disability and Rehabilitation*, 37(11), pp. 997-1003. doi: 10.3109/09638288.2014.952450.

Unsworth, C.A., Timmer, A. and Wales, K. (2018) ‘Reliability of the Australian Therapy Outcomes Measures for occupational therapy’, *Australian Occupational Therapy Journal*, 65(5), pp. 376-386. doi: 10.1111/1440-1630.12476.

World Health Organization (2001) *International classification of functioning, disability and health (ICF)*. Geneva: WHO.

**Appendix one – search strategy**

**CINAHL Search**

|  |  |  |
| --- | --- | --- |
| **Search Term** | AND | **Search Term** |
| “Intermediate care” OR | “Therapy Outcome Measure\*” OR |
| Rehabilitation OR | TOMs OR |
| MH Rehabilitation, community based OR | AusTOM\* OR |
| Physiotherap\* OR | AusTOMs-OT OR |
| “Physical therap\*” OR | AusTOMs-PT |
| “Occupational therap\*” OR |  |
| “Home-based therap\*” OR |  |
| MH “Home Health Care” OR |  |
| “Home Care Service\*” OR |  |
| “community therap\*” |  |  |

**MEDLINE Search**

|  |  |  |
| --- | --- | --- |
| **Search Term** | AND | **Search Term** |
| “Intermediate care” OR | “Therapy Outcome Measure\*” OR |
| Rehabilitation OR | TOMs OR |
| MH Rehabilitation OR | AusTOM\* OR |
| Physiotherap\* OR | AusTOMs-OT OR |
| “Physical therap\*” OR | AusTOMs-PT |
| “Occupational therap\*” OR |  |
| “Home Health Care” OR |  |
| “Home Care Service\*” OR |  |
| “Home-based therap\*” OR |  |
| MH “Home Care Services” OR |  |
| “Community therap\*” |  |

**EMBASE Search**

|  |  |  |
| --- | --- | --- |
| **Search Term** | AND | **Search Term** |
| “Intermediate care” OR | “Therapy Outcome Measure\*” OR |
| Rehabilitation OR | TOMs OR |
| MH “Community-based rehabilitation” OR | AusTOM\* OR |
| Physiotherap\* OR | AusTOMs-OT OR |
| “Physical therap\*” OR | AusTOMs-PT |
| “Occupational therap\*” OR |  |
| “Home Health Care” OR |  |
| MH “Home Care” OR |  |
| “Home Care Service\*” |  |
| “Home based therap\*” |  |
| “Community therap\*” |  |  |

**EMCARE Search**

|  |  |  |
| --- | --- | --- |
| **Search Term** | AND | **Search Term** |
| “Intermediate care” OR | “Therapy Outcome Measure\*” |
| Rehabilitation OR | TOMs OR |
| MH “Community-based rehabilitation” OR | AusTOM\* OR |
| Physiotherap\* OR | AusTOMs-OT OR |
| “Physical therap\*” OR | AusTOMs-PT |
| “Occupational therap\*”OR |  |
| “Home Care Service\*” OR |  |
| MH “Home Care” OR |  |
| “Home Health Care” OR |  |
| “Home based therap\*” |  |
| “Community therap\*” |  |

**PubMed Search**

|  |  |  |
| --- | --- | --- |
| **Search Term** | AND | **Search Term** |
| “Intermediate care” OR | “Therapy Outcome Measure\*” OR |
| Rehabilitation OR | TOMs OR |
| Physiotherap\* OR | AusTOM\* OR |
| “Physical therap\*” OR | AusTOMs-OT OR |
| “Occupational therap\*” OR | AusTOMs-PT |
| “Home Health Care” OR |  |
| “Home Care Service\*” OR |  |
| “Home Based therap\*” OR |  |
| “Community therap\*” |  |