Title: The experiences of professionals with using information from patient-reported outcome measures to improve the quality of healthcare: a systematic review of qualitative research

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ABSTRACT

Objectives: To synthesise qualitative studies that investigated the experiences of healthcare professionals with using information from patient-reported outcome measures to improve the quality of care.

Design: A qualitative systematic review was conducted by searching PubMed, PsycINFO and CINAHL with no time restrictions. Hand searching was also performed. Eligible studies were evaluated using the Critical Appraisal Skills Programme (CASP) toolkit for qualitative studies. A thematic synthesis identified common themes across studies. Study characteristics were examined to explain differences in findings.

Setting: All healthcare settings.

Participants: Healthcare professionals.

Outcomes: Professionals' views of PROMs after receiving PROMs feedback about individual patients or groups of patients.

Results: Sixteen studies met the inclusion criteria. Barriers and facilitators to the use of PROMs emerged within four main themes: collecting and incorporating the data (practical), valuing the data (attitudinal), making sense of the data (methodological) and using the data to make changes to patient care (impact).

Conclusion: Professionals value PROMs when they are useful for the clinical decision making process. Practical barriers to the routine use of PROMs are prominent when the correct infrastructure is not in place before commencing data collection and when their use is disruptive to normal work routines. Technology can play a greater role in processing the information in the most efficient manner. Improvements to the interpretability of PROMs should increase their use. Attitudes to the use of PROMs may be improved by engaging

professionals in the planning stage of the intervention and by ensuring a high level of transparency around the rationale for data collection.

INTRODUCTION

Patient-Reported Outcome Measures (PROMs) are questionnaires that assess patients' health, health-related quality of life, and other health-related constructs (1). They have traditionally been used to describe the burden of disease and to establish the comparative effectiveness of different treatments (2). There is increasing interest in the use of PROMs to improve health services. Many policy makers and researchers believe that PROMs provide an essential perspective on the quality of health services (2-4) and it has been suggested that they have the potential to transform how healthcare is organised and delivered (5). PROMs have been used to compare and reward the performance of healthcare providers in England (2), America (6, 7), Australia (8-10) and Sweden (7), and their potential to improve quality has also been recognised in Canada (4) and the Netherlands (11).

The mechanisms through which PROMs feedback to healthcare professionals might improve the quality of healthcare depends on the type of feedback provided.

PROMs may be used to provide professionals with information about their performance against their peers (1, 2). It is posited that PROMs should act to improve the quality of healthcare in the same way as any other benchmarking tool (2, 3). Peer benchmarking is thought to stimulate an intrinsic desire in healthcare professionals to succeed relative to their peers (12). In addition, it is hypothesised that professionals and organisations are motivated to avoid any negative consequences of peer benchmarking. These consequences depend on the extent to which the benchmarking exercise is used to support broader quality improvement strategies such as clinical governance, payment by performance, clinical commissioning and patient choice (2, 13). For example, PROMs are used alongside other indicators to measure the performance of English NHS providers and drive up quality throughout the NHS "by encouraging a change in culture and behaviour focused on health outcomes not process" (14). PROMs are also used in England to guide the award of 'bonus' payments to NHS Trusts (15), to inform the decisions of commissioning bodies about which NHS Trusts to contract with (16) and to facilitate patients when choosing a provider for certain

elective surgical procedures (17). Finally, it is hypothesised that although the benchmarking of outcomes does not provide a direct insight into the causes of inter-professional performance variation, it can stimulate audit and research activities that might lead to the discovery of these causes. For example, professionals who are discovered to have poor performance might learn from the practices of those with the best performance (18).

Patient-level PROMs feedback can also be provided to professionals. This is hypothesised to facilitate personalised care management by highlighting the concerns and needs of individual patients in a structured format (19). The information can be used to highlight previously unrecognised health problems (20), assess the effectiveness of different treatment plans (21), monitor disease progression (22), stimulate better communication (23) and promote shared decision making (24, 25). Specific quality improvements that might arise from a consideration of PROMs feedback include ordering additional tests, referring the patient to a new specialist, amending prescribed medicines or treatments, issuing personalised advice and education on symptom management, and altering the goals of treatment plans to better reflect patient concerns (26, 27).

The evidence supporting the effectiveness of PROMs in contributing to improvements in the quality of healthcare is heterogeneous and it has been difficult to draw definitive conclusions about their impact on patient care (28). While there is some evidence that PROMs are effective in enhancing patient-clinician communication and helping to recognise new health issues, there is little evidence that PROMs feedback to healthcare professionals changes care management or improves patient outcomes (28, 29). This evidence should be considered alongside findings from the broader literature. First, the effects of audit and feedback interventions are generally small to moderate and we understand relatively little about the complex process dynamics associated with successful interventions (30). Second, the use of theory in studies of audit and feedback is rare which signals a need for more theoretically informed interventions (31).

Qualitative research with end users plays an important role in helping us understand why interventions are ineffective in practice and in the development of theoretical models to support successful implementation. Examining first hand experiences may provide unique insights into the challenges associated with implementing and using PROMs in practice (32, 33). Synthesising this evidence may help explain the modest impact of PROMs on professionals' behaviour to date. Two previous reviews have reported the evidence about professionals' views on the use of outcome measures in general, not specifically focusing on PROMs (34, 35). The first was a non-systematic review which provided an overview of the barriers to the routine use of outcome measures (34). The second was a systematic review which looked at the barriers and facilitators to the use of outcome measures in routine practice (35). This review was limited to the views of allied health professionals and excluded professions such as medicine and nursing. Given the unique methods and perspectives introduced by PROMs, and their broad use across different professional groups, there is a clear need for a systematic review of the qualitative literature that focuses exclusively on PROMs and includes all relevant healthcare professionals.

This review aimed to identify qualitative studies that have investigated the experiences of healthcare professionals with the use of PROMs as a means to improve the quality of healthcare and to synthesise findings about the barriers and facilitators to their use. The review also explores how the characteristics of different studies influenced the results observed.

METHODS

Eligibility criteria

Studies that met the following criteria were included: language of publication was English; participants were healthcare professionals; examined professionals' views of PROMs after receiving PROMs feedback about individual patients or groups of patients; and used a qualitative design.

Information sources

A search without time restriction was performed in PubMed, PsychINFO and CINAHL in August 2013 (online supplementary appendix 1). Reference lists of included papers were screened for additional studies.

Search

A search strategy was developed comprising three blocks of terms relating to PROMs, qualitative research and professionals' opinions. Brettle et al. previously developed a comprehensive filter for PROMs which was used as the first block for this search (36). The second block was based on a published search filter developed to capture qualitative evidence (37). The third block was developed by the authors to meet the aims of this specific review. It combined terms relating to 'professionals' and 'opinions', and used a proximity operator which identified any combination of these terms when they appeared within three words of each other.

Study selection

MB initially screened the titles and abstracts of articles retrieved by the search strategy. The full text of potentially relevant articles was evaluated if there was not enough information to make an informed decision about relevance to the systematic review from the abstract. Where there was continued uncertainty about whether such papers met the inclusion criteria, another reviewer (JB) was consulted for a second opinion and discrepancies were discussed to form a consensus.

Data collection process

All articles that met the inclusion criteria underwent data extraction for information about study aims, location and setting, study design, participants, recruitment, PROMs used, level of application, feedback strategy and study findings. A quality appraisal of included studies using

an established toolkit was performed by MB, and reviewed by JB (38). The quality appraisal assessed the following criteria: appropriate design, appropriate recruitment strategy, appropriate data collection method, reflexivity, ethical research, appropriate analytic method, appropriate discussion of findings, and overall value. A sensitivity analysis was performed using matrices to compare the patterns of themes identified in studies of different quality.

Synthesis of results

Thematic synthesis was used to analyse the papers included in the review (39). It compares themes across studies, looks at study characteristics to help explain differences in findings and develops interpretations beyond original studies to generate analytical themes (39). The synthesis was performed by entering the entire results section from each study into QSR International's NVivo 10 software (40). The synthesis involved three stages: free line-by-line coding of findings from primary studies, categorising free-codes to develop descriptive codes, and developing analytical themes which explored the relevance of the descriptive codes in the context of the research question (39). Study characteristics and findings were cross-referenced on a matrix to explore whether thematic patterns were associated with certain studies. Meetings and correspondence between the co-authors throughout the analysis process helped to evolve the themes and challenge the interpretation of the data.

RESULTS

Study selection

8,344 potentially relevant publications were identified by our search strategy and 7,930 were excluded on the basis of their titles. An abstract review of the remaining 414 articles was performed and 87 were chosen for full text review. Seventy-one articles were excluded at the full text stage leaving 16 relevant articles (Figure 1 and Table 1). These were an entirely different set of studies to those included in the only previous systematic review of professional opinions about the routine use of outcome measures (35).

Study characteristics

Over half of the included studies were carried out in the UK (n=9). The remainder took place in Sweden (n=3), Australia (n=2), the United States (n=1), and Canada (n=1). The study settings included primary care (n=5), hospital care (n=4), hospice care (n=2), and mixed settings (n=4). The setting of one study was not clear (41).

The healthcare professionals studied included physicians (n=4), nurses (n=2) and therapists (n=1). Eight studies included a mixture of healthcare professionals and one study did not explicitly state the healthcare professionals involved (41). The treatment focus of the studies was mental health (n=7), palliative care (n=5), oncology (n=1), acute care (n=1), respiratory medicine (n=1), and rheumatoid arthritis (n=1).

Qualitative data was collected through interviews in nine studies, focus groups in five studies, and a mixture of interviews and focus groups in two studies. Most studies provided PROMs feedback to healthcare professionals at the individual patient level (n=13). Two studies provided feedback about the average scores of groups of patients and in one study this aspect of the design was unclear (42). All studies provided insights into how PROMs data is used by professionals in practice and a subset of eleven studies also explored the feasibility of data collection.

The quality appraisal exercise found that the included studies were generally good at justifying the research design, providing details on the participants included in the research, explaining the data collection process, clarifying ethical issues, outlining the data analysis methods and the findings, and identifying the value of the research. However, some shortcomings which emerged from the critical appraisal included: unclear rationale for the sampling methods used; a failure to explicitly justify the chosen data collection methods; inadequate incorporation of reflexivity into the research process; insufficient detail about the rigour of analysis; and inadequate methods to increase the credibility of findings (online supplementary appendix 2).

Three studies were judged to be of a higher standard than the rest on these latter criteria (43-45).

Synthesis of results

The themes and sub-themes which emerged from the thematic synthesis are described in Table 2 and excerpts from the original studies are provided for illustrative purposes. A detailed description of the themes identified in each study is displayed in the online supplementary appendix 3. As each paper had slightly different aims, their overall contribution to each theme depended on the focus of the original studies.

Theme 1: Practical considerations

This theme captures issues around the data collection process and the effective use of the information. Practical issues were identified in 14 studies (8, 9, 41, 42, 44-53). In nine studies the workload associated with collecting and analysing data was identified as a significant barrier to the routine use of PROMs (8, 9, 41, 42, 44, 48-50, 53). However, some of the studies identified that workloads could be reduced if PROMs feedback was integrated naturally into the consultation process (45, 49, 51). The difficulty or ease of PROMs administration also emerged as a determinant of successful implementation. Barriers emerged when the questionnaire was not user-friendly (8, 9, 41, 42, 44, 45, 47, 48, 50, 53), but data collection was facilitated when patients had few difficulties completing the measure (41, 42, 47). Some studies identified a lack of collaboration between colleagues as leading to the burden of data collection being placed on a small number of staff members (9, 42, 45, 48). Lack of clear guidelines on the data collection process (patient eligibility, timing, frequency and location of administration), and on how to correctly analyse and interpret the data created further barriers (8, 42, 44, 47, 49, 50, 52). However, some studies identified that flexibility in the data collection process was necessary due to variability in the acuity of patients (41, 51). Professionals were more willing to engage in the process when management showed

appreciation for the additional work involved and when management themselves became deeply involved in the process (8, 9, 42).

Study participants also stated that appropriate training was necessary to effectively engage in the process. They specifically proposed that a lack of training on how to recruit patients, deal with difficult scenarios and effectively use the information created inevitable barriers (8, 9, 42, 44, 48, 49, 51). Some studies found that having time to become familiar with the measures prior to implementation was a facilitating factor (8, 9, 41, 50, 51). Professionals recognised that support during the initiation stage of the data collection was helpful. The effective use of PROMs data was curtailed when statistical support was not available as professionals lacked the expertise to appropriately analyse and interpret the data (9, 42, 44, 45, 53). Professionals recognised that they also required support from the wider service to adequately deal with the issues that the measurement highlighted such as referral to specialist professionals or access to suitable treatments (44, 45). Lastly, the use of technology was recognised as a barrier when it slowed down the process (8, 9, 51) and a facilitator when it made the collection of the data and dissemination of the findings more efficient (8, 46, 49).

Theme 2: Valuing the data

This theme captures professionals' attitudes to the use of PROMs. It was identified in 11 studies (8, 9, 43-45, 48, 49, 51-54). Barriers to appreciating the value of PROMs emerged when the objectives for collection were not transparent. In such circumstances, professionals questioned the motives behind the data collection and expressed fear about how the results would impact on their practice and patient care (8, 9, 43, 48, 51, 53). Furthermore, barriers were identified when professionals were not open to receiving feedback or changing their clinical practice (8, 9, 43-45, 49, 51-54).

Theme 3: Making sense of the data

This theme captures the methodological considerations that are associated with PROMs. Methodological factors were identified in 13 studies (8, 9, 41-46, 48-50, 52, 53). The

interpretability of PROMs data influenced professionals' opinions about their scientific value in a quality improvement context (8). Professionals appreciated the graphic presentation of results (49), but identified the need for more sophisticated feedback which clearly depicts what constitutes a clinically important change (8). Others requested aggregated data about the effectiveness of different treatments to complement data about individual patients (46). Concerns about the validity of PROMs emerged in many studies as professionals questioned whether the data produced a genuine reflection of care (8, 9, 41, 43-45, 48, 50, 52, 53). Professionals identified situations where the validity of measurement was compromised including when patients did not complete the measures accurately, provided socially desirable responses, hid symptoms, failed to follow instructions, or when staff administered the measure incorrectly or in a non-standardised manner. Some professionals also criticised the sensitivity of the measures to accurately detect a change in specific patient populations (41, 42, 53).

Theme 4: Impact on patient care

This theme was identified in all studies and captures issues around the impact of PROMs on care processes and outcomes. There were mixed views regarding the causal link between the use of PROMs and improvements in patient care. Professionals identified that the use of PROMs in practice had the potential to improve the processes of care by enhancing communication, increasing patient education, promoting joint-decision making, screening for health issues, monitoring changes in disease severity and response to treatment, and stimulating better care planning. Professionals appreciated PROMs as a tool to complement their own clinical judgement and to stimulate professional development. The role of PROMs was also recognised as a research and audit tool (41, 42, 48). However, some professionals found that the measures were not of clinical value as the results provided them with no new information (8, 9, 41, 42, 44, 46, 50, 53, 54). Professionals highlighted some indirect effects of using PROMs on patient care. Negative effects included the intrusive nature of collection on the patient's privacy and the doctor-patient interaction, the capacity to narrow the focus of a

consultation, and the opportunity cost for what were perceived to be more important aspects of care. Furthermore, professionals found that certain questions distressed patients and thought the process had the potential to damage the patient-clinician relationship (8, 9, 41-45, 48, 50, 53). Positive indirect effects of collecting PROMs were also identified which included the ability to build patient confidence in the competence of the professional, to manage patient expectations and to assist in handing responsibility of care back to the patient (42, 43, 45, 46, 48, 50, 51).

Explaining the findings

The relationship between themes and study characteristics was examined to help explain the findings. The characteristics examined included the professional group under study, the study setting, the healthcare issue under examination and the function of the PROM. No explicit pattern was explained by the inclusion of different professionals, settings or healthcare issues. However, the function of the PROMs used in individual studies may have influenced the study findings. Practical facilitators were most likely to be observed in studies where PROMs functioned as a care management tool; however these studies also tended to use computer administration and feedback (8, 9, 45, 46, 49, 51). A similar trend was observed with the facilitators identified in the methodological theme (8, 9, 46, 49). In addition, a lack of clarity regarding the objectives for measurement emerged as a barrier, and involvement of management emerged as a facilitator, when PROMs were used as performance monitoring tools (8, 9). Only one study did not identify any positive impacts of using PROMs. This study employed PROMs as a screening and care management tool for mental health issues (44). The studies which did not identify any negative aspects of collecting PROMs employed PROMs as care management tools (47, 49, 51, 52).

Risk of bias

The three studies identified as being of a higher quality did not identify any unique themes or sub-themes (43-45). However, one of these studies exclusively did not identify any positive

effects of using PROMs in practice (44).

DISCUSSION

The barriers and facilitators identified in this review were categorised into practical considerations, attitudes towards the value of the data, methodological concerns, and the impact of feedback on patient care. Practical considerations included workload implications, the ease of data collection, the level of collaboration among colleagues, the provision of clear guidelines for implementation, the level of managerial involvement, the availability of training and support, and the use of technology. Attitudes towards the use of PROMs were associated with the transparency of objectives, and the openness to feedback and change. Methodological concerns identified included the interpretability of the information and the validity of the measures. The impact of the feedback depended on the usefulness of the information to guide decisions on patient care and the indirect effects of routinely collecting PROMs data.

There is a subtle but important distinction between the need for support to correctly analyse and interpret PROMs data which we have classified as a practical issue, and the concerns raised by professionals about the validity and interpretability of PROMs which we have classified as a methodological issue. In the 'practical' theme we are addressing the support (statistical help and training) that professionals feel they need in order to familiarise themselves with a relatively alien concept. This is different from fundamental scientific concerns about PROMs which may endure even if statistical support and training are provided.

The themes presented in this review were consistent across different studies. There was some evidence that PROMs were viewed more positively when they functioned as care management tools for individual patients and more negatively when producing performance data about the care delivered by professionals to groups of patients. This may indicate that PROMs have more value to professionals when they produce data that can be linked to individual patient care but

this interpretation should be considered with caution due to the small number of studies where PROMs were used as performance monitoring tools.

Strengths and limitations

This is the first review to synthesise the qualitative evidence on the experiences of professionals who have first-hand experience of the use of PROMs as a means to improving the quality of healthcare. This review has some limitations. First, the review only focused on English-language articles and it is possible that different experiences with the use of PROMs may be apparent in countries where English is not the first language. Second, only one reviewer performed the initial screening and study selection, and although reference searching was performed to reduce the likelihood of missing appropriate studies there is still a small chance that some relevant literature was missed. Third, the results are based on the credibility of findings in the original studies and there is a lack of detail in all but three studies about the use of methods to enhance credibility. However, the themes identified are quite logical and are similar to those presented in previous reviews of the use of outcome measures generally (34, 35). Fourth, the study presents only the perceptions of healthcare professionals and it does not attempt to represent the views of patients or healthcare managers about the value of PROMs.

Relevance to previous literature

The themes identified in this systematic review are well-known barriers and facilitators to the success of audit and feedback interventions in other contexts. Our systematic review confirms the importance of these issues while revealing new insights specific to PROMs. For example, practical barriers such as inadequate organisational and technical support have been comprehensively documented in the quality improvement literature (55-57). This review deepens our understanding of these issues in the context of PROMs by highlighting the considerable barriers associated with data collection, and the need for specific training in the use and interpretation of psychometric instruments. Similarly, there is evidence from the

broader literature that interventions are more likely to fail when professionals display negative attitudes and are suspicious about the purpose of audit and feedback (58-60). Our review highlights the specific issues associated with negative attitudes to PROMs, including methodological concerns about the validity of patient-reported data and worries about the potential for routine PROMs administration to disrupt patient care. It is of note that these concerns have also been voiced by patients in separate qualitative studies (61, 62). Finally, there is evidence from other contexts that feedback has the greatest impact when it is focused on specific task based solutions and delivered in a goal-setting context (30, 63). Our review underlines how difficult it is for PROMs to satisfy these criteria given the problems experienced by professionals in attempting to interpret PROMs feedback and turn the information into concrete quality improvement solutions.

Implications for clinicians and policymakers, and future research

It is clear that many professionals remain to be convinced about the value of PROMs but that they could be encouraged to engage with their use given the right practical and methodological support. Greater investment in data collection technology could relieve much of the human workload and make feedback more timely (64). Greater clarity over the objectives of data collection and investment in methodological training are additional solutions. It is interesting that PROMs feedback have shown greatest promise in the area of mental health, a field where the use of these measures has long been embedded in routine practice, and where professional attitudes may be more positive as a consequence (21, 24, 28, 65). However, it is important to understand the cause of any resistance as professionals may have good reasons for not implementing or using PROMs (66). For example, PROMs have well known problems with interpretability and professionals may therefore have legitimate grounds for resisting their use (33, 67). The appropriateness of using PROMs in a quality improvement context is also a source of legitimate debate. Most commonly used PROMs were developed to evaluate the effectiveness of different treatments and therefore may not provide sufficient or appropriate information to guide quality improvement activities. This problem is

388 indicative of a relatively poor theoretical basis for the use of PROMs in a quality improvement
389 context (27).
390
391 The barriers identified in this review may represent a failing on the part of those who advocate
392 the use of PROMs to sufficiently engage professionals in the planning stage and to
393 acknowledge the conflict between managerial and professional objectives (68, 69). A deeper
394 understanding of the motivations of different stakeholders is essential to disentangle how
395 PROMs can be used to improve quality in reality. Further qualitative studies with professionals
396 and case-studies of PROMs initiatives are essential (7). This would help researchers and policy
397 makers gain an understanding of how this information impacts on clinical decision making.
398 Lastly, evidence is required to identify the specific healthcare issues and patient populations
399 that have large variability in outcomes as these are where PROMs data is likely to have the
400 greatest impact. Otherwise, as Wolpert points out, inappropriately implementing PROMs in
401 practice may only lead to an increased bureaucratic burden with little positive impact on care
402 (70).
403

404 **Table 1: Studies investigating the views of professionals (n=16)**

Reference	Location, setting and focus	Study design	Participants	PROMs feedback	Study Aims
Bendtsen, 2003 (46)	Sweden, hospital setting, COPD	Focus groups (n=2)	Physicians (n=9)	Patients completed SF-36 on a touch screen computer and feedback was provided during the consultation	'To examine the thoughts and attitudes among physicians concerning the value of an HRQoL measurement in addition to the traditional clinical and laboratory data used'
Callaly, 2006 (8)	Australia, public mental health service	Focus groups (n=13) and interviews (n=7)	Nurses (n= 64) Allied health professionals (n=12) Medical staff (n=7)	Patients completed BASIS-32 on a computer generating immediate feedback for professionals. Aggregated data reported publically	'This paper explores the attitudes of mental health workers in one public health service towards the implementation and use of routine measurement'
Cranley, 2004 (54)	Canada, hospital setting, acute care	Informal semi-structured interviews	Nurses (n= 29)	Continuous assessment and feedback of information on functional status, symptoms, therapeutic self-care, falls and pressure ulcers	'To provide initial insight from rational and phenomenological theoretical perspectives into how nurses integrate baseline and follow-up outcomes assessment into practice to inform their clinical decision-making'
Dorwick, 2009 (43)	UK, primary care, depression	Semi-structured interviews	GPs (n= 34)	Patients completed PHQ-9, HAS or BDI and feedback was provided immediately to GPs	'To gain an understanding of doctors' and patients' views of the introduction of severity questionnaires for depression and their implementation in practice'
Dunckley, 2005 (42)	UK, nursing home and hospice, palliative care	Action research including interviews	Nurses (n=8) Doctor (n=1) Health care assistants (n=6)	Unclear details on feedback. POS collected from patients and clinicians	'To further understand the barriers to outcome measure implementation and to identify and facilitate methods of over-coming these hurdles'
Eischens, 1998 (47)	US, hospice setting, palliative care	Interviews	Nurses (n=8)	Patients completed McGill and HQLI, and feedback was provided immediately to nurses	'The purpose of this study was to assess whether hospice nurses found QOL evaluations useful in designing and adjusting their patients care plans'
Hughes, 2003 (41)	UK, palliative care	Semi-structured interviews	Professionals (n=22)	Patients and staff completed POS, and feedback was provided to staff	'The objective of this study was to elicit professional views and experiences of using outcome measures'
Hughes, 2004 (48)	UK, hospital, nursing home and primary care setting, palliative care	Semi-structured Interviews	Staff (n=13 of which 12 were nurses)	Patients and staff completed POS, and feedback was provided immediately to staff	'The study aimed to: describe the implementation of a palliative care outcome measure in non-specialist palliative care setting and to understand the implementation of the setting'
Kettis-Lindblad, 2007 (49)	Sweden, hospital setting, oncology	Semi-structured interviews	Oncologists (n=6)	Patients completed SEIQoL-DW and disease-related SEIQoL on touch-screen computer, and feedback was provided during the consultation	'This study explored patients' and oncologists' perceptions of using a computer-administered, individualised QOL instrument to support an oncologic consultation'

Reference	Location, setting and focus	Study design	Participants	PROMs feedback	Study Aims
Mason, 2008 (50)	UK, primary care, post-natal depression	Semi-structure interviews	Health visitors and nurses (n=19)	Patients completed EPDS and feedback was provided immediately to GPs	To address beliefs behind attitudes using a qualitative methodology to access the perceptions of healthcare professionals towards screening using the EPDS
Meehan, 2006 (9)	Australia, mental health setting	Focus groups (n=34)	Mental health staff (n=324)	Patients completed Mental Health Inventory on a computer generating patient level feedback or summary reports for comparisons (clinician reported measures also collected)	'The aim of this study was to explore clinician reactions to (i) the introduction of routine outcome measures and (ii) the utility of outcomes data in clinical practice'
Mitchell, 2011 (44)	UK, primary care, depression	Focus groups (n=4)	Multi-disciplinary teams including GPs, nurses, doctors in training, mental health workers and managers (n=38)	Patients with new-onset depression completed PHQ-9 and feedback was provided immediately to professionals	'To explore primary care practitioner perspectives on the clinical utility of the NICE guideline and the impact of the QOF on diagnosis and management of depression in routine practice'
Slater, 2005 (53)	UK, hospice setting, palliative care	Focus group (n=1)	Nurses (n=4), allied health professional (n=1) support staff (n=3)	Patients and staff completed POS, and feedback was provided to staff	'The aim of the study was to evaluate the implementation of POS for use in the day hospice setting to improve patient care'.
Tavabie, 2009 (45)	UK, primary care, depression	Semi-structure interviews and focus groups	GPs (n= 20)	Patients completed PHQ-9 on a computer generating immediate feedback for professionals	'To identify effects of using mental health questionnaire on views of GPs managing depression, and how this might influence patient care'
Unsworth, 2011 (51)	UK, counselling service, psychological therapy	Focus groups (n=2)	Therapists (n=9)	Patients completed CORE-Net on computer generating immediate feedback for professionals	'The purpose of this study was to answer the research question: How do National Health Service (NHS) therapists and clients perceive and experience CORE-Net?'
Wressle, 2003 (52)	Sweden, day treatment programme, rheumatoid arthritis	Interviews	Psychotherapists (n=2) Occupational therapists (n=2) Physician (n=1) Social worker (n=1) Assistant nurse (n=1)	Patients completed the COPM and feedback was provided to interdisciplinary team members	'The aim of this study was to investigate whether the structured method focused on client involvement, the COPM, could work as a tool for a rehabilitation team in a day treatment programme for clients with rheumatoid arthritis'

Table 2: Taxonomy of themes, their definitions and excerpts from the studies

Themes	Sub-themes	Definition	Excerpts
Practical considerations	Time/Workload	The impact of PROMs on workloads	*Barrier:* 'I think time is the critical issue and that we are being asked to spend more and more time on collecting information and filling out forms'(8) *Facilitator:* 'Some doctors claimed that this intervention might save time, since it provides information in a systematic, time-effective way' (49)
	Administration	The difficulty or ease of collecting PROMs	*Barrier:* 'There were a number of nurses who reported difficulties administering the HQLI. The primary difficulty was patient's confusion with the answer scales' (47) *Facilitator:* 'Participants reported POS to be easy to use, brief and relevant' (41)
	Collaboration	The level of cooperation among colleagues	*Barrier:* 'I tried to leave [POS] questionnaires for people in the diary and it just didn't work. I actually came in [on days off] to do it because I rang up to see if anyone had bothered and they hadn't' (48)
	Guidelines	The provision of clear or flexible guidelines	*Barrier*: 'The hospice ARC (Action Research Collaboration) debated the frequency of POS administration at most meetings' (42) *Facilitator*: 'They expressed the need for user flexibility when using it' (51)
	Involvement of management/ Use of data	The level of management involvement in the process, and the active use of the information to guide decision making	*Barrier:* 'Many staff were frustrated that senior medical staff did not fully appreciate the process' (9) *Facilitator: '*Senior staff had pre-empted these concerns by discussing POS scores at weekly team meetings so enabling all staff to see the importance and relevance of the data' (42)
	Training/ Familiarisation	The provision of training and time to become familiar with measures prior to implementation	*Barrier:* 'I think we had little education about it really, they've just said this is QOF, this is what you've got to ask and they're the questions. We didn't really have any training' (44) *Facilitator:* 'It was recognized that as one became familiar with the measures the time required for data entry was considerably reduced' (9)
	Technology	The use of technology for collecting and disseminating the data	*Barrier:* 'Access to computers, slowness of the computer networks, lack of computer skills among staff, forgetting passwords and understanding the summary graphs were frequently mentioned' (9) *Facilitator*: 'Allowing the patient to complete the test at home and having the results transferred directly to the doctor's computer before the consultation' (49)
	Support	The provision of adequate support to correctly collect, analyse and interpret the data, and support from the wider service to help provide appropriate care	*Barrier:* 'This required more statistical analysis than was available to both settings' (42) *Facilitator*: 'There are many things that crop up once you start collecting the data …it's great to have someone to call on for help' (9)
Valuing the data	Transparent objectives	The provision of transparent objectives for collecting PROMs	*Barrier: '*Staff became disappointed in its performance as a patient-assessment tool, the staff's perception of its purpose became ambiguous, and there was uncertainty as to whether POS was an audit tool by which their effectiveness would be monitored by management' (53)
	Open to feedback and change	The openness to receiving feedback and willingness to change practice	*Barrier:* 'I have my own way of doing things' (54) *Facilitator: '*The cornerstone of good practice… a type of psychiatric X-ray that shows you where the problems are and how good our treatment… interventions are at sorting out these problems' (9)
Methodological considerations	Interpretation	The ability to make sense of the feedback	*Barrier:* 'Your gut feeling about how depressed someone is and their PHQ-9 score often don't marry up' (44) *Facilitator:* 'Some clinicians were seeking more sophisticated feedback than just graphs showing current or current-compared-with-past ratings' (8)
	Validity of measures	The belief that results were a true reflection of care	*Barrier:* 'They were also aware of the potential for manipulating scores' (43).
	Sensitivity	The sensitivity of the measures to detect change	*Barrier: '*Direct clinical benefits of using the POS were less apparent to hospice staff, probably owing to the complex clinical needs of their patients that the POS is not sensitive enough to detect ' (42)
Impact on patient care	Quality improvement	The impact of the information on patient care	*Barrier: 'QOF tick-box exercise as far as I'm concerned' (44)* *Facilitator:* 'Clients were given the opportunity to identify their own problems, and to make priorities according to what was meaningful to them, this resulted in more distinct goals than before they started to use the COPM'*(52)*
	Indirect effects	The additional factors that may impact on patient care	*Barriers: '*I've actually had people say it, they just make them feel worse…I know how bad I feel and I don't need to see it written down' *(50)* *Facilitator:* 'I think that people will develop a respect for your clinical judgement if you spend time listening to them' (45)

Competing interests

None declared

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Contributions

MB and JB were involved in the conception, design, analysis and interpretation of data. JG was involved in the design, analysis and interpretation of data. All authors were involved in drafting the article and revising it critically for important intellectual content, and approved the final version to be published. MB is the guarantor.

Data sharing

All supporting documents have been submitted as appendices.

Figures

Figure 1: Flowchart of study selection

Appendices

Appendix 1- Search strategy

Appendix 2: Critical appraisal of included studies using CASP assessment tool

Appendix 3: Themes identified as barriers and facilitators to the use of PROMs within each study

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