

Multisource Feedback Systems for Quality Improvement in the Health Professions: Assessing Occupational Therapists in Practice

CLAUDIO VIOLATO, PHD; LEANNE WORSFOLD, RPN; JAN MILLER POLGAR, PHD

Introduction: The objective was to develop and psychometrically evaluate (feasibility, reliability, validity) a questionnaire-based multisource feedback (MSF) system for quality improvement (QI) for occupational therapists (OTs).

Methods: Surveys were developed for assessment of OTs by clients, co-workers, and themselves, respectively, using 5-point scales with an “unable to assess” category. A sample of 238 OTs participated.

Results: The number of respondents for the co-worker questionnaire was 2621, and for the client questionnaire it was 2881. The mean ratings ranged from 4 to 5 for each item on each scale. All of the instruments' full scales had very high Cronbach's $\alpha > 0.92$. The factor analyses revealed a 7-factor solution (66.3% of the total variance) for the co-worker survey, and a 4-factor solution for the client questionnaire (73.2% of the variance).

Discussion: An MSF system employing surveys that have high reliability, validity, and feasibility was developed to provide feedback to OTs on core competencies and skills. It is suggested that similar MSF systems are feasible for health professionals in general.

Key Words: multisource feedback, quality improvement, reliability and validity, clinical performance

Introduction

Multisource systems are used for both developmental (ie, formative) and appraisal (ie, summative) purposes, and to facilitate change for both the person assessed and the organization as a whole.¹ Supervisors, subordinates, peers, clients, and the assessed person complete questionnaires examining key attributes or core competencies. Subsequently, the assessed person receives anonymous feedback about performance. This feedback system offers a more global per-

spective than could be offered by 1 or a few sources alone.² Important characteristics of health professionals, such as clinical competence, humanistic qualities, collegiality, patient management, personal communication, patient communication, technical skills, and professional development can be assessed with the use of multisource feedback (MSF).

Several converging factors have motivated a number of health professions to improve their quality assurance (QA) procedures. These factors include new legislation, increasing complexity of professional practice, increased public demands for accountability, and improvements in testing and assessment. Many health professionals, such as physicians^{3,4} and pharmacists,⁵ have undertaken initiatives to improve quality assurance.

Legislation in a number of countries (eg, the United States, New Zealand, Canada, Australia) has focused on assuring a system for monitoring the continued competency among health professionals.⁶ In Ontario, the Ontario Health Professions Legislation Review Group (OHPLRG)⁷ proposed that health professions “develop and establish by regulation a continuing competence program for the purpose of maintaining and enhancing the competence and standards of practice of members in the care of patients and in record keeping in relation to the member's practice” (p 97).⁶ The Regulated Health Professions Act, 1991 (RHPA) was proclaimed in Ontario in 1993 to achieve some of these goals.⁸

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Dr. Violato: Professor and Director, Medical Education Research Unit, Department of Community Health Sciences, University of Calgary, Calgary, AB, Canada; *Ms. Worsfold:* Manager, Quality Programs, College of Occupational Therapists of Ontario, Toronto, ON, Canada; *Dr. Polgar:* Associate Professor and Graduate Chair, School of Occupational Therapy, University of Western Ontario, London, ON, Canada.

Correspondence: Claudio Violato, Medical Education Research Unit, Department of Community Health Sciences, Faculty of Medicine, University of Calgary, 3330 University Drive NW, Calgary, AB, T2N 4N1, Canada; e-mail: violato@ucalgary.ca

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Several groups have moved in the directions of meeting the goals of the OHPLRG.⁹ The College of Medical Radiation Technologists of Ontario,¹⁰ for example, has developed a model of quality assurance, as has the Ontario College of Pharmacists.⁶ Elsewhere in Canada, the Alberta College of Physicians and Surgeons developed a project to refine and improve their quality assurance practices,³ as has the Alberta College of Pharmacists. The College of Occupational Therapists of Ontario regulates 4200 occupational therapists (OTs) in Ontario, Canada. A legislative framework prescribes the College's role and responsibilities to set out the principles and requirements of the QA Program. Developing a peer, client, and self-assessment tool supports the College in meeting its regulatory requirements. The costs for developing and maintaining QA programs are generally borne by the licensing or regulatory bodies.

Multisource Feedback Systems

Most assessment systems for health professionals have focused on only 1 or a few sources of information for quality assurance and feedback.¹¹ Ramsey and colleagues in their system of assessing practicing physicians, for example, employed only peer assessment.⁹ To improve the validity of an assessment system, it is necessary to employ multisource or "360-degree" feedback.¹² These feedback systems have gained prominence in industry,² but have been used only to a limited extent to assess health care professionals.¹ In the Violato, Lockyer, and Fidler¹³ assessment system of surgeons, for example, standardized instruments are utilized to gather data from medical colleagues, nonmedical coworkers, patients, and self-assessments. This system has been recently extended to the assessment of pediatricians¹⁴ and anesthesiologists.¹⁵

Such systems have also been used to assess professional practice and facilitate learning. The College of Physicians and Surgeons of Alberta, for example, mandated a multisource feedback system for all physicians in the province. Instruments have been adopted and psychometrically tested for pediatricians, psychiatrists, family physicians, anesthesiologists, surgeons, and medicine specialists, demonstrating that this system of evaluating physicians is valid, reliable, and feasible. Each physician receives a "report card" summarizing his or her own performance, as well as peer-group performance.

Health professionals do make changes in their practices based on the feedback. A study of family physicians, for example, showed that 66% reported making at least 1 change in their practices based on feedback.¹⁶ Changes were initiated most frequently for aspects of practice associated with communication with patients and support of patients. A study on the impact of the feedback on surgical practice also indicated that surgeons initiate change from information gained from multisource feedback.¹³

A frequently underemphasized or neglected concern in assessment models or QA programs is the feasibility and utility of measurement procedures or instruments. Although

some assessments may provide adequate reliability and some evidence of validity, their utility or feasibility of use may be somewhat low. The use of performance assessments in objective structured clinical exams (OSCEs), for example, although widely used in licensing testing in many health professions, may be very limited in their applicability in QA programs because of their high costs and resource utilization. In any case, the usability, ease of administration, or feasibility of the procedures is an important element of any QA program.

The main purpose of the present study was to develop a multisource feedback system for occupational therapists and to evaluate the results of the questionnaires psychometrically.

The intent of the questionnaires was 2-fold: provide formative feedback to therapists to engage change in practice and provide a method to calibrate self-assessment, and to identify those therapists who required further competency assessment. Specifically, we developed instruments (self, co-worker, and client) and conducted a study to assess the feasibility of the assessments and collect empirical evidence for reliability and validity.

Methods

Participants

A total of 238 (from an initial 250—95.2% participation rate) occupational therapists registered with the College of Occupational Therapists of Ontario (COTO—total registered is approximately 4200) were randomly selected to participate in the competency review process. Participation in the competency review is mandatory. The initial sample represented approximately 6% of the total number of occupational therapists practicing in Ontario. The number of respondents for the co-worker questionnaire was 2621 (91.8% response rate). Co-workers were any person who worked with the OT (eg, other OTs, physicians, nurses, physiotherapists, etc). There were 2881 (80.7% response rate) clients that completed questionnaires. Clients included individuals or families who had received occupational therapy services from the COTO registrant.

Procedures

We developed a table of specifications^a based on occupational therapists' essential competencies,^b expert input, focus groups, and MSF programs implemented by other groups.¹⁰ From the table of specifications, we developed 3 assessment instruments (co-worker, self, and client—see TABLES 1 and 2 for items). The items on the co-worker instrument had a 5-point response scale (eg, "Rate your co-worker OT on these statements using the scale:

^aA table of specifications is a "blueprint" or plan on what is to be assessed or measured and how this will be done.

^bCollege of Occupational Therapists of Ontario, *Essential Competencies of Practice for Occupational Therapists in Canada*. 2nd ed. 2003.

TABLE 1. Co-worker and Self-Questionnaire Descriptive Statistics and Unable-to-Assess Rates

Item	Co-Worker Questionnaire (n = 2621)			Self-Questionnaire (n = 238)		
	Mean	SD ^a	UA ^b %	Mean	SD	UA%
1. Communicates effectively with clients	4.66	0.548	3.9%	4.42	0.616	0.0%
2. Communicates effectively with clients' families/caregivers	4.64	0.561	8.2%	4.30	0.638	1.3%
3. Communicates effectively with co-workers	4.62	0.615	1.5%	4.30	0.636	0.4%
4. Determines the appropriateness of the referral	4.62	0.568	12.7%	4.21	0.697	5.0%
5. Performs appropriate interventions/recommendations	4.67	0.542	4.1%	4.21	0.655	0.8%
6. Maintains documentation according to professional standards	4.61	0.605	17.7%	3.95	0.734	0.8%
7. Practices in a client-centered manner	4.74	0.504	1.7%	4.49	0.614	0.0%
8. Ensures confidentiality of client's information	4.75	0.484	5.4%	4.37	0.660	0.0%
9. Ensures privacy for clients and their families/caregivers	4.74	0.488	7.7%	4.31	0.692	0.4%
10. Collaborates effectively with co-workers	4.67	0.583	2.2%	4.33	0.653	0.8%
11. Follows through with treatment plans	4.68	0.532	8.6%	4.22	0.664	2.5%
12. Respects the rights of clients	4.78	0.460	2.0%	4.57	0.583	0.4%
13. Engages in professional development	4.55	0.616	19.3%	4.03	0.767	0.4%
14. Accepts responsibility for professional actions	4.69	0.547	8.2%	4.40	0.654	0.4%
15. Deals with health care resources efficiently	4.59	0.584	14.5%	4.00	0.685	2.1%
16. Manages his/her own stress effectively in the workplace	4.44	0.698	11.9%	3.83	0.783	0.0%
17. Is aware of his/her own limitations	4.52	0.640	11.1%	4.18	0.687	0.0%
18. Assumes responsibility for clients within occupational therapy's scope of practice	4.68	0.531	8.6%	4.33	0.673	0.8%
19. Regularly evaluates his/her own services	4.47	0.660	29.9%	3.85	0.746	0.0%
20. Participates effectively as a member of the client's care team	4.71	0.537	4.3%	4.37	0.665	2.1%
21. Shows empathy for clients and their families/caregivers	4.73	0.507	2.4%	4.61	0.545	0.0%
22. Handles emergency situations effectively	4.58	0.612	34.9%	4.06	0.720	11.8%
23. Demonstrates safe practices with clients/caregivers	4.71	0.513	7.9%	4.33	0.660	0.4%
24. Demonstrates safe practices with self and co-workers	4.68	0.540	6.8%	4.21	0.689	0.8%
25. Is nonjudgmental of clients and their families/caregivers	4.69	0.561	2.1%	4.33	0.651	0.0%
26. Demonstrates professional and ethical behaviors toward co-workers	4.73	0.531	1.5%	4.40	0.647	0.4%
27. Respects the professional knowledge and skills of co-workers	4.74	0.517	1.8%	4.49	0.607	0.0%
28. Would you recommend this occupational therapist if a member of your own family needed care?	Yes = 98%	No = 2%				

^aSD = standard deviation.

^bUA = unable to assess; co-worker Cronbach's alpha reliability = 0.97; self Cronbach's alpha reliability = 0.96

1 = among the worst; 2 = bottom half; 3 = average; 4 = top half; 5 = among the best") with an option of "unable to assess" (UA). The self-instrument was a literal translation of the co-worker to the first person. Similarly, the client questionnaire had a 5-point response scale (1 = strongly disagree; 5 = strongly agree) with an option of "not applicable" (NA). The instruments take less than 10 minutes to complete. The items on the client survey were considered to be aspects of the occupational therapist's practice on which a client could reasonably be expected to comment. All three instrument data underwent descriptive

analyses, item analyses, and reliability analyses. Additionally, the co-worker and client instrument data underwent factor analyses.

As part of the QA review and evaluation process, each registrant selected to participate in the process was asked to solicit feedback from 15 clients and 12 co-workers, using the surveys that were designed for this project. Support was given to registrants who had difficulty with this requirement.

Feedback profiles for both criterion- and norm-referenced performance were sent to all participants. Norms were developed in the present study as data were collected from

TABLE 2. Client Questionnaire Descriptive Statistics and Item Analysis ($n = 2881$)

Item	Mean	SD ^a	NA ^b %
1. Asked my permission before starting services	4.75	0.490	4.4%
2. Explained the services provided to me	4.77	0.474	1.7%
3. Kept me informed about the process	4.74	0.507	2.0%
4. Treated me with respect	4.89	0.365	0.3%
5. Listened to my concerns	4.84	0.401	1.2%
6. Respected my privacy	4.84	0.415	1.9%
7. Prevented others from learning confidential information about me	4.73	0.578	13.4%
8. Answered my questions so that I could understand	4.81	0.444	0.7%
9. Showed concern for my well-being	4.84	0.423	1.7%
10. Paid attention to my safety	4.82	0.435	6.1%
11. Did what they said they were going to do	4.79	0.477	1.8%
12. Returned my telephone calls	4.78	0.500	26.2%
13. If I needed further service, I would go back to this occupational therapist (OT)	Yes = 94.4%	No = 5.6%	
14. I would recommend this OT to others	Yes = 97.4%	No = 2.6%	

^aSD = standard deviation.

^bNA = not applicable; Cronbach's alpha reliability = 0.93.

the various informant groups (co-workers, self, and clients). Four months subsequent to receiving feedback reports, questionnaires were sent to 238 OTs that participated in the MSF process to obtain feedback on their perception of the survey instruments, process established to facilitate the distribution of the surveys, and comments on the usefulness of the client and co-worker feedback in influencing change in their practice.

Results

The mean number of returned co-worker questionnaires per registrant was near 12 (mean = 11.0) with a maximum of 13 and a minimum of 1. Results of the analyses of the responses for this instrument are summarized in TABLE 1. The mean ratings are generally quite high (mean = 4.58, min = 4.44, max = 4.78). The standard deviation (SD) across all items is around two-thirds (mean SD = 0.621, min = 0.460, max = 0.698) of a full-scale point.

TABLE 1 also contains a summary of the numbers of respondents that indicated "unable to assess" (UA) to the items. Two of the items on the co-worker questionnaire had more than 20% of the respondents selecting UA (No. 19—Regularly evaluates his/her own services—29.9%; No. 22—Handles emergency situations effectively—34.9%), which may indicate response rate problems.

From these results, it is clear that the large majority of respondents do respond to all items for the co-worker instrument. The reliability analyses conducted on the whole scale of 27 items (excluding item 28) produced a Cronbach's α coefficient of 0.97. The average standard error of measurement (SEM) across all of the items was 0.11.

The self-questionnaire is a literal adaptation of the co-worker questionnaire but written in the first person. The mean across all 27 items ranged from 3.83 to 4.61 (mean = 4.22). The SDs across all items were around two-thirds of 1 full scale point (mean = 0.664) ranging from a minimum SD = 0.545 to a maximum SD = 0.783 (TABLE 1). Internal consistency reliability (Cronbach's α) for the self-questionnaire was 0.96 with an average SEM across all the items of 0.13. OTs rated themselves lower (mean rating 4.40 vs 4.58) than did co-workers. For the client questionnaire, item 12 (Returned my telephone calls) had a 26.2% NA response rate. This result probably accurately reflects that many clients would not phone the OT or expect a return call (eg, those in institutions).

The range of item means across all 12 items (items 13 and 14 required a yes/no response) on the client questionnaire was 4.73–4.89 (mean = 4.81). The SDs across all 12 items were around half of 1 full-scale point ranging from a minimum SD = 0.365 to a maximum SD = 0.578 (mean SD = 0.471).

The ratings on the client questionnaire are similar to the ratings on the co-worker assessments. Co-workers rate the OTs more favorably than the OTs rate themselves (see TABLE 1). Overall, the OTs tended to be more critical of themselves than were their OT colleagues and non-OT clients (see TABLE 2). This is very typical of self and other ratings.^{13–15} Cronbach's α for the total client questionnaire scale was 0.93, with an average SEM across all the items of 0.19.

Factor Analysis

To evaluate the structure of the questionnaire and further assess the functioning of the items, factor analyses were con-

ducted. Accordingly, 2 separate factor analyses were conducted—1 for the co-worker data and 1 for the client data. In both, all Likert-type items were intercorrelated with the use of Pearson product-moment correlations. This correlation matrix was then decomposed into principal components and these were subsequently rotated to the normalized varimax criterion. With the use of exploratory factor analyses, 7 principal components were extracted for the co-worker questionnaire based on theoretical considerations and cohesiveness of the factors. This solution accounted for 66.3% of the variance. For the client data, 4 principal components were extracted that accounted for 73.2% of the variance. In both cases, the principal component solution was rotated to normalized varimax criterion (convergence required 8 iterations for the co-worker data and 6 for the client data). These results are summarized in TABLE 3.

The competencies (factors) assessed by these instruments are listed in TABLE 3 and include professional responsibilities, practice knowledge, utilizes practice process, critical thinking, communication, professional development, and manages practice environment. These are typical types of competencies required for health care professionals and are those outlined for occupational therapists.

Feedback Profiles

In the present study, items are anchored on a 5-point scale with adjective descriptors (1 = among the worst; 5 = among the best, or 1 = strongly disagree; 5 = strongly agree for the client instrument). In addition, norms were developed with the use of data collected from the various informant groups (co-workers, self, and clients). Therefore feedback can be and was provided to the OT on both normative (eg, means, SDs and percentiles) and criterion-referenced performance (scale scores based on the anchors or adjective descriptors).

FIGURE 1 is an example profile that contains the combined information from co-worker data, client data, and self-data. The performance scales are those derived from the instruments and are linked to the essential competencies as set out by the COTO. In FIGURE 1, the OT is compared to the norms (“norm values” on the profile—norm referenced) with self-assessments, and to the scale score values (the scale values summarized on the vertical of the profile—criterion-referenced). In this example, the OT is above the mean on all of 7 performance scales or essential competencies: (1) professional responsibilities, (2) practice knowledge, (3) utilization of practice process, (4) critical thinking, (5) communication, (6) professional development, and (7) management of practice environment.

Follow-up Survey

Four months subsequent to receiving feedback reports, questionnaires were sent to 238 OTs that participated in the MSF process. A total of 154 OTs responded to the questionnaire (64.7% response rate). A majority of the respondents were

very experienced OTs (56.55% had more than 11 years of experience). Similarly, a very large majority (about 90% or greater) found the self-, co-worker, and client instruments easily readable and easy to understand. Very few indicated that instruments “need improvement” (<2%).

The respondents were generally positive about the MSF instruments and process. Moreover, the focus of the respondents appears to be on formative evaluation, how informative and helpful the information is, and the time demands on providing the information.

Discussion

The main findings of the present study are (1) co-workers can provide data on the instrument that is reliable and valid for providing feedback to OTs, (2) clients can readily complete the instrument and provide valid and reliable data on the performance of OTs, (3) OTs themselves can provide a reliable and valid self-assessment, and (4) the graph in the report card is clear and understandable. The feasibility of the present MSF system is high, as all informants were readily able to respond to items (there were very few items that had many “unable to assess” or “not applicable” responses). The numbers of co-workers ($n = 12$), and clients ($n = 15$) that registrants were asked to solicit to complete the instruments were not problematic for most of the participants.

Two items on the co-worker questionnaire (19 and 22) had high “unable to assess” response rates. This result probably accurately reflects that many OTs may never deal with emergency situations (Item 22) and thus can’t be assessed for this. Item 19 requires an assessment of how reflective the OT is—something that is very difficult for a professional observer to assess in many cases. The 26.2% NA response rate on Item 12 of the client questionnaire probably accurately reflects the behavior assessed. Accordingly, these UA and NA response rates add validity evidence as they accurately reflect the OTs’ practice.

The MSF system piloted in the present study provides substantial evidence for the feasibility of this type of quality improvement for occupational therapists. All categories of informants (self, co-workers, clients) were able to provide data and completed the questionnaires. The MSF provides objective data from the critical informants that form the professional practice of occupational therapists. These instruments can be applied in a relatively efficient and effective manner through pencil-and-paper assessments in a mail-out process.

The internal consistency reliabilities of all three instruments were very high (Cronbach’s $\alpha > 0.90$) as might be expected of highly refined instruments of this sort. Accordingly, the standard errors of measurement were small. The distributional properties of the items (ie, means, SDs, range, etc.) were very much as expected and have been found in other MSF applications.^{2,10}

In the exploratory factor analyses of the co-worker and client data we were able to derive the 7 competencies on the

TABLE 3. Factors Derived From Data Sources

Data Source—Co-worker Questionnaire	Factors	% Variance
9. Ensures privacy for clients and their families/caregivers	Professional responsibilities	38.6
12. Respects the rights of clients		
14. Accepts responsibility for professional actions		
16. Manages his/her own stress effectively in the workplace		
17. Is aware of his/her own limitations		
18. Assumes responsibility for clients within occupational therapy's scope of practice		
21. Shows empathy for clients and their families/caregivers		
25. Is nonjudgmental of clients and their families/caregivers		
4. Determines the appropriateness of the referral	Practice knowledge	12.4
6. Maintains documentation according to professional standards	Utilizes practice process	5.8
7. Practices in a client-centered manner		
5. Performs appropriate interventions/recommendations	Critical thinking	5.2
11. Follows through with treatment plans		
1. Communicates effectively with clients	Communication	4.3
2. Communicates effectively with clients' families/caregivers		
3. Communicates effectively with co-workers		
8. Ensures confidentiality of client's information		
20. Participates effectively as a member of the client's care team		
26. Demonstrates professional and ethical behaviors toward co-workers		
27. Respects the professional knowledge and skills of co-workers		
13. Engages in professional development		
19. Regularly evaluates his/her own services		
15. Deals with health care resources efficiently	Manages practice environment	3.2
22. Handles emergency situations effectively		
23. Demonstrates safe practices with clients/caregivers		
24. Demonstrates safe practices with self and co-workers		
Data Source—Client Questionnaire		
4. Treated me with respect	Professional responsibilities	45.2
6. Respected my privacy		
7. Prevented others from learning confidential information about me		
1. Asked my permission before starting services	Utilizes practice process	14.6
3. Kept me informed about the process		
9. Showed concern for my well-being		
2. Explained the services provided to me	Communication	9.3
5. Listened to my concerns		
7. Prevented others from learning confidential information about me		
8. Answered my questions so that I could understand		
12. Returned my telephone calls		
10. Paid attention to my safety	Manages practice environment	4.1

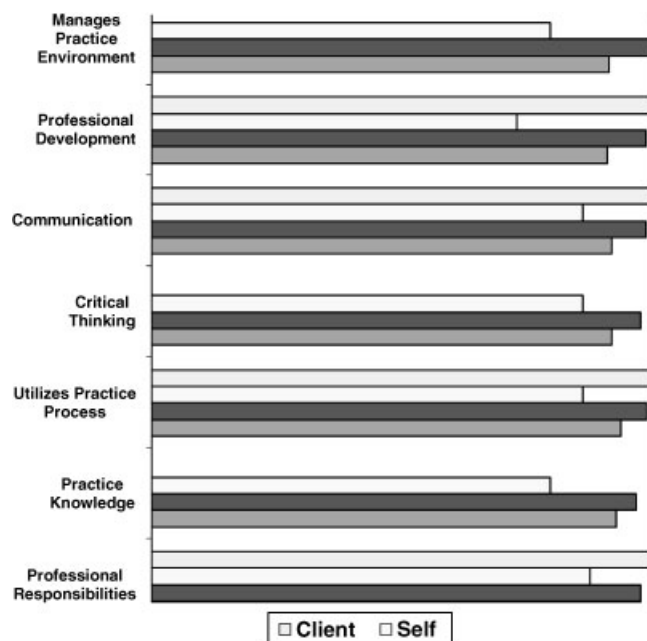


FIGURE 1. Example of an assessment performance profile by co-workers, clients, and self.

co-worker questionnaire and 4 competencies on the client data. The factors are theoretically meaningful and cohesive. These results provide evidence of construct validity of the present MSF system. The feedback information on the follow-up survey also provides evidence of the validity of the system, as respondents for the most part found it easy to participate in the system, were able to recruit the required number of informants (co-workers and clients), and found the feedback (report card) simple to understand and helpful. As the feedback is intended for formative evaluation, it will be interesting to follow up in further studies to assess what changes, if any, OTs have implemented as a result of participation in the MSF procedure. The low-scoring OTs (<10th percentile) can be identified as possibly requiring further assessment or remediation.

Nonetheless, there are some limitations of the present study. All of the data are questionnaire based—further validity evidence will require direct observation of the OTs, possibly in a multitrait multimethod matrix approach for robust evidence of construct validity. The efficacy of the feedback to the individual clinicians for altering and improving practice should be studied further.

Conclusion

Generally, all 3 instruments have very good psychometric properties and are working well. The internal consistency reliabilities are high for all 3 measures, producing correspondingly small errors of measurement. The item characteristics (means, range, standard deviations) are all within

Lessons for Practice

- Health professionals should be assessed on an ongoing basis for quality improvement employing multisource feedback (MSF).
- The informants for MSF should include peers, co-workers, clients or patients and the self.
- Questionnaire-based MSF is feasible with evidence for validity and reliability.
- Feedback information can result in changes and improvement for practice.

expected ranges and parameters for assessments of the present sort. The scales measure the essential competencies. These results are in consonance with other, similar research.^{13–15} Based on the present results, the current instruments and procedures have high reliability, validity, and feasibility. The item analyses, reliability, and factor analyses all indicate that the present instruments are generally working very well for assessing OTs as required by principles of quality improvement and a MSF framework.

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