

Measures of interprofessional education and collaboration

JENNIFER THANNHAUSER, SHELLY RUSSELL-MAYHEW, &
CATHERINE SCOTT

University of Calgary, Calgary, Alberta, Canada

Abstract

Healthcare and social services professionals are being called to engage in interprofessional education (IPE) and interprofessional collaboration (IPC) in order to provide efficient and effective care to clients and patients. As such, it is important to conduct research that contributes to evaluation of collaborative practice. A necessary component to any strong quantitative research methodology is the type of instruments used for data collection. However, identifying valid and reliable instruments to use in this area of research can be a daunting task. The purpose of this paper is to review the quantitative measures (i.e., surveys and questionnaires) described in the interprofessional literature. Twenty-three instruments were identified and analyzed for validity and reliability statistics, sample size, ease of access to items on measure, and applicability of measure to diverse professional populations. The two primary measures reviewed are the Readiness for Interprofessional Learning Scale (Parsell & Bligh, 1998) and the Interdisciplinary Education Perception Scale (Luecht, Madsen, Taugher, & Petterson, 1990). Limited information existed for the remaining measures. Despite the number of measures available for assessing and evaluating IPE and IPC, most lack sufficient theoretical and psychometric development. Several issues that impact the development of sound measures are discussed and implications for future IPC are proposed.

Keywords: *Interprofessional education, interprofessional collaboration, questionnaires, surveys, scales, quantitative measurement*

Introduction

Healthcare and social services professionals are being called to participate in collaborative activities in order to provide efficient and effective care to clients and patients. However, saying one is involved in interprofessional collaboration (IPC) and actually engaging in collaborative practice are two different experiences. It becomes increasingly important to carry out research that assesses the degree to which IPC is taking place, individuals' attitudes towards it, and its effectiveness. The purpose of this paper is to review the instruments that are currently available for use in quantitative research that measure different aspects of IPC.

Correspondence: Jennifer Thannhauser, MEd, Doctoral Candidate, Division of Applied Psychology, Faculty of Education, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada T2N 1N4. Tel: +1 403 613 1399.
E-mail: j.thannhauser@ucalgary.ca

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There is no commonly used definition of IPC within the healthcare literature today. Barr, Koppel, Reeves, Hammick, and Freeth (2005) defined IP collaboration as “learning with, from and about each other to improve collaboration and the quality of care” (p. 31). Others have suggested that IPC has two major components: “(1) the construction of a collective action that addresses the complexity of client needs, and (2) the construction of a team life that integrates the perspectives of each professional and in which team members respect and trust each other” (D’Amour, Ferrada-Videla, San Martin Rodriguez, & Beaulieu, 2005, p. 127). According to Willumsen (2008), collaboration is achieved through a balance of differentiation, the unique contributions of different professionals, and unified, integrative efforts on both interpersonal and organizational levels. Regardless of definition, agreed upon features of IP collaboration include: common goals, trust, and skills in collaboration; however, without a clear definition, the difficulty of measuring IP collaboration increases.

An important and related concept is interprofessional education (IPE). IPE can be defined as “any type of educational, training, teaching or learning session in which two or more health and social care professions are learning interactively” (Reeves et al., 2007). Such programs are designed to improve how professionals work together so as to provide more effective and comprehensive care to clients and patients.

Researchers have looked at specific components of IPC, such as attitudes toward collaborative learning and practice (Lindqvist, Duncan, Shepstone, Watts, & Pearce, 2005; Parsell & Bligh, 1999; Reid, Bruce, Allstaff, & McLernon, 2006). MacKay (2004) suggested that the attitudes of individuals from one profession can impact how they perceive and behave towards individuals from another profession. If the success of IPC is dependent on factors such as building trust, establishing strong communication strategies, developing common aims, addressing power differences, and establishing organizational structures and processes that facilitate collaboration (Colombo, Bendelow, Fulford, & Williams, 2003; Huxham & Vangen, 2005), then it is important to identify the attitudes professionals have towards one another in preparation for such activities.

Need for evaluation of interprofessional education and collaboration

In order for a strong body of literature to be built in the area of IPE and IPC, well-designed research studies must be completed. Both qualitative and quantitative methods can be, and have been, used to provide insight into IPC and its related concepts (e.g., Giacomini, 2004; Rosen & Callaly, 2005). However, in order for these studies to be of value, steps must be taken to ensure the research is conceptually and methodologically sound (Carpenter & Dickinson, 2008; Heinemann & Zeiss, 2002). For quantitative research, this requires instruments with well-developed psychometric properties.

In the authors’ quest to identify a measure for examining IPC within the obesity field, it was realized that such instruments were difficult to find. Our aim was to identify questionnaires that could assess IPC across a variety of professions, inclusive of setting (e.g., healthcare, academia). That is, we were not interested in assessing IPC within a specific team or teamwork; rather, we wanted to assess IPC between individuals within a broad field. Given this context, we were particularly interested in knowing the attitudes individuals had towards IPC and their readiness to engage collaboratively within the field of obesity prevention, treatment, and research. However, measures that could capture the breadth of relevant roles and settings were particularly difficult to identify.

Currently, there are no reviews of the instruments available for use in this broad capacity. This paper provides a review of relevant tools available at the time of the literature search. The authors hope it will be a useful resource for those interested in studying IPC from a

quantitative perspective. Further, easier access to information on tools for measuring interprofessional practice will hopefully encourage more individuals to engage in research in the area of IPE and IPC collaboration.

Method

The quantitative measures reviewed in this paper were obtained through a computerized search of PsycINFO and MEDline. The following search terms were used: multidisciplinary, interprofessional, interdisciplinary, multiprofessional, team work, shared learning, collaboration, attitudes, perceptions, questionnaire, scale, measurement, and evaluation. Initially, we searched for abstracts describing or using questionnaires for measuring any aspect of IPC in healthcare. This search yielded several hundred abstracts. Subsequently, the focus was narrowed to articles that described measures applicable to a broad range of occupations and settings. In situations where studies used previously developed measures, the original article(s) describing the measures was(were) found and used in this review. Instruments designed to measure IPC within specific relationships (e.g., nurse-physician) or teams were excluded. Given the limited number of articles applicable to our broad collaborative context, we included measures relevant to IPE or IPC as long as they met the other criteria (i.e., not exclusive to a particular team in a practice or research setting). These articles were then reviewed for references to other measurement tools which assessed interprofessional relationships in a variety of professional fields.

The measures focused on in our final review had to be relevant to a wide range of professions. In order for an instrument to be included in this review, information on the purpose of the instrument, scale design, and sample size had to be published in a journal article. We also looked for articles that described the psychometric properties of the selected instruments.

The search yielded 23 unique instruments that could be used within our broad context for measuring attitudes, readiness, or interactional factors needed for IPC. These will be discussed in the context of the original publications for the measures. See the Appendix for a summary of the results. The instruments were analyzed based on the following variables: validity and reliability statistics, sample size, public availability of items on measure, and applicability of measure to different populations.

Results

Numerous instruments have been developed and used by researchers to measure varying aspects of IPE and/or IPC. Unfortunately, only a limited number of these instruments are actually applicable to professionals working/learning together within a broad health discipline. Most of the available tools are designed for assessing collaboration within specific relationships (e.g., nurse-physician) or developed teams.

Many of the instruments available to researchers to assess IPE and IPC were found to lack sufficient information about their psychometric properties (Anderson, Manek, & Davidson, 2006; Barnes, Carpenter, & Dickinson, 2000; Beatty, 1987; Carpenter & Hewstone, 1996; Harward, Tresolini, & Davis, 2006; Hope et al., 2005; Larkin & Callaghan, 2005; Lewandowski & GlenMaye, 2002; Parsell, Spalding, & Bligh, 1998; Ponzer et al., 2004; Tunstall-Pedoe, Rink, & Hilton, 2003). See the Appendix for further details on each of these tools. Without knowing the psychometric properties, the usefulness of these instruments is restricted. It appears as though none of the aforementioned tools have been used more than once, limiting one's confidence in them. However, most of the authors cited above have

published the items used in their questionnaires, perhaps opening the door for other researchers to further develop the instruments.

Several researchers have also attempted to develop questionnaires specifically for their own research studies. Of those identified in the process of this review, only two have provided a comprehensive report on the psychometric properties of the instrument (Forman & Nyatanga, 2001; Wolf, 1999). The authors have published information in regards to their sample size, the style of questionnaire, and reliability and validity data. Unfortunately, the items of the questionnaires have not been published, preventing the use of the instruments in further studies. It is difficult to have confidence in these instruments without further replication.

Eight formal measures for assessing aspects of IPE and IPC were identified in the literature. A limited body of evidence exists for six of these measures, yet attempts have been made to develop their psychometric properties. These six measures included the:

- Index of Interdisciplinary Collaboration (IIC) (Bronstein, 2002),
- Multidisciplinary Collaboration instrument (MDC) (Carroll, 1999),
- Interprofessional Perceptions Scale (IPS) (Ducanis & Golin, 1979; Golin & Ducanis, 1981),
- Role Perceptions Questionnaire (RPQ) generic form (MacKay, 2004),
- University of Western England Interprofessional Questionnaire (UWE IQ) (Pollard, Miers, & Gilchrist, 2004, 2005), and
- Modified Index of Interdisciplinary Collaboration (MIIC) (Oliver, Wittenberg-Lyles, & Day, 2006, 2007).

The psychometric properties and sample sizes of these instruments are variable. Each measure has only been used in the literature one or two times, limiting the information available about the utility of the measure. Of most concern with these measures is the limited attempt to report on the validity of the items used. More research needs to be done with these instruments to confirm their reliability and validity, and/or make revisions to improve the psychometric properties. Of the eight scales first identified, the two most easily accessible, commonly used, psychometrically validated instruments were chosen for further investigation: the Readiness for Interprofessional Learning Scale (RIPLS) and the Interdisciplinary Education Perception Scale (IEPS).

A substantial body of literature is being built exploring the validity and reliability of these instruments. Various authors have used the measures in their own studies (e.g., Horsburgh, Lamdin, & Williamson, 2001), have conducted research assessing the psychometric properties of the tools (e.g., McFadyen, et al., 2005; McFadyen, Webster, & Maclaren, 2006; McFadyen, Maclaren, & Webster, 2007), and attempts have even been made to create versions applicable to different cultural contexts (e.g., El-Zubeir et al., 2006). Both the RIPLS and the IEPS were developed for use in an academic context – the first focusing on student readiness for IPE and the second upon the development of students' attitudes and skills based on a curriculum delivered in an interprofessional context.

The RIPLS was originally published in 1998 (Parsell & Bligh, 1999, 1998). The tool is designed to assess the readiness of healthcare students for shared learning; however, it has also been used with post-graduate healthcare professionals (Reid et al., 2006). Since its inception, continued work has been completed to ensure the validity and reliability of the measure. Some concern had been expressed about the stability of the original three subscales of the instrument; therefore, McFadyen et al. (2005, 2006) published a revised 4-factor version of the scale. Large sample sizes have been used when testing the instrument and the items have been published numerous times.

The original IEPS was published by Luecht et al. (1990). It is considered to be a perceptual/attitudinal inventory for use with a student, healthcare population. The measure was designed initially as a pre/post-assessment of students' involved in an IPE experience. With permission, we modified the wording of the questions slightly to suit our particular population (i.e., professionals already working in the obesity field). As with the RIPLS, further research has since been done to improve the psychometric properties of the IEPS by adjusting the factor structure of the instrument (see McFadyen et al., 2007). The sample size from the original study was somewhat small ($n = 143$); however, larger samples have been used with the revised version. Once again, the questionnaire items have been published and are easy to access.

Discussion

Despite the numerous tools available for measuring different aspects of IPE and IPC within a broad field of study, there are limited choices with sound psychometric properties and adequate time spent on development. Indeed, given our findings (see the Appendix) researchers seem to be reinventing the wheel on the development of their quantitative tools. Also see Heinemann and Zeiss (2002). This issue is not new to interprofessional research. Schmitt (2001), for example, summarized the history of research on IPC within the health care system, identifying several methodological challenges, including poor conceptualization of key terminology, lack of psychometric evaluation, and instruments were typically not developed from a theoretical base or used beyond a single study. Though there have been improvements in the development of instruments to measure IPE and IPC, many of the issues Schmitt identified are perpetuated today.

There are several possible explanations for the wide variety of low quality quantitative research instruments available to evaluate IPE and IPC. First, there is a lack of consistent vocabulary used in the field of IP collaboration. For example, it is not uncommon for the terms “interdisciplinary” and “interprofessional” to be used interchangeably. However, these terms have been deemed conceptually distinct (e.g., D'Amour & Oandasan, 2005). As demonstrated by the search terms used in this review, there are numerous combinations and thousands of studies one would need to search through in order to identify the research instruments that have previously been used in the literature. This can be a daunting task, leaving the researcher to develop their own tool or avoid research in the area of IP collaboration altogether.

Second, there are numerous perspectives on, and components of, IPE and IPC that need to be taken into account. Recent developments in the interprofessional literature have led to the identification of three key factors that influence collaborative relationships: interactional factors; organizational factors; and, systemic factors (Martin-Rodriguez et al., 2005). However, all the instruments identified in this article focus only on interactional factors. Instruments therefore need to be developed that focus on both organizational and systemic factors. In addition, the focus for most measures in the interprofessional literature has been on a narrow range of health professionals, especially the relationship between nurses and physicians (e.g., Schmitt, 2001). The results of this review provide evidence of the small number of instruments available for use with a diverse range of professionals. Unfortunately, very few of the studies in this review reported on instruments designed for use with professionals already practicing in the health care and social fields.

Third, there is also a lack of consensus about what should be measured when looking at the various dimensions of IPE and IPC. For example, Heinemann and Zeiss (2002) outlined and evaluated numerous measures for assessing team performance. These instruments

range in the number and type of factors considered to be important in teamwork. However, working in a team is not necessarily synonymous with collaborative practice. Without a clear definition for IPC, for example, it is difficult to determine which factors are most relevant in a given context (Scott & Hofmeyer, 2007).

Fourth, there has been limited effort to develop the psychometric properties of the measurement tools that currently exist. While time has been invested into developing the psychometric properties of the two questionnaires included in this review (RIPLS and IEPS), the other measures we found (see the Appendix) offer limited, if any, psychometric information. It is therefore difficult to be confident in the results of these studies when there is lack of evidence in support of the instruments being used. Time needs to be invested in building a supportive literature base for the measures that currently exist.

In terms of the limitations of the included measures, one can see that there are some important similarities. All, for example, rely on self-report data to measure IPE and IPC. This type of data can provide valuable insight into the respondents' perceptions of IP collaboration and/or education. However, in the context of measuring interactional factors, self-report data may not provide an accurate description of the actual interactions among professionals.

Further, while most of the measures included in this review assess attitudes or perceptions towards IPE and IPC across a variety of professions only three instruments (Bronstein, 2002; Carroll, 1999; Pollard et al., 2004, 2005) attempted to measure interactional factors needed for IPC. Research is needed to further develop quantitative instruments to assess interactional factors between professionals working together in a broad discipline. As with our interest in assessing IPC in the area of obesity practice and research, information about how professionals work together within a broad field can inform the development of effective relationships to meet the goals of a given field.

Conclusion

This paper provides a comprehensive summary of quantitative instruments currently available for research evaluating IPE and IPC. Several attempts have been made by researchers to develop psychometrically sound and accessible instruments. The results of this review have several implications. First, it is important to develop consensus around the definitions of IPE and IPC. It would be wise for researchers in the field to continue to refine and disseminate constructs relevant to these fields. Second, further development of and agreement on the elements necessary for collaborative learning and practice would help to ensure researchers are assessing the same construct. Third, continued effort needs to be invested in developing the psychometric properties of the measures. Availability of adequate tools for assessing IPE and IPC is a necessary piece for advancing the field, especially given the role that these activities potentially have for improving the quality of healthcare and social services. Building upon this work, over time, it is hoped that the quantitative measurement literature will develop, contributing to the development of quality studies and practice innovations in the areas of IPE and IPC.

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Appendix

Measures of interprofessional education and collaboration.

Measure /Authors	Reliability	Validity	Sample	Design	Comments
Anderson, Manek, & Davidson, 2006			126 students (nursing, medicine, PT, OT, ST, dietician, radiographers, clinical psych, pharmacy, cardiophysicologists)	5-pt Likert scale (number of questions unknown)	Pre-post questionnaire; record knowledge & attitudes related to IP learning; items not published
Barnes, Carpenter, & Dickinson, 2000	Internal consistency: professional identification ($r = 0.82-0.91$; role clarity ($r = 0.72-0.82$))		Students in post-graduate certificate/Master's program: 2 cohorts ^a (25 T1C1; 20 T2C1; 46T1C2; 38 T2C2); Nurses, OT, SW, other (e.g., psychologists, psychiatrists)	7-pt Likert scale	Rate attitudes to attributes as they apply to own profession, other professions, own profession as seen by others; pre-post design
Beatty, 1987	Internal consistency: $r = 0.76$ (only reported for a 19-item attitude scale)		Nursing students	3 scales: 22-item attitude scale, 15-item health care team programme content scale, 12-item demographic scale	Pilot study used in development; rates attitudes towards health care teams; insufficient information about the scales and questions; items not published
Index of Interdisciplinary Collaboration (Bronstein, 2002)	Test-retest reliability: $r = 0.824$; internal consistency: $r = 0.92$; Flexibility subscale was not internally consistent: $r = 0.56-0.62$	Face validity (items drawn from the literature; pilot test); low to moderate construct validity	462 SW	49-item scale (subscales: interdependence, newly created professional activities, flexibility, collective ownership of goals, reflection on process) - revised to a 42-item scale following factor analysis; 5-pt Likert scale	Measures interactional factors of IP collaboration, reverse scoring of some items to minimize response set; use of factor analysis in development of measure; items not published

(continued)

Appendix (Continued).

Measure /Authors	Reliability	Validity	Sample	Design	Comments
Carpenter & Hewstone, 1996			41 medical students (26 male, 15 female); 44 SW students (14 male, 30 female)	7-pt Likert scale	Single group, pre-test post-test; rating attitudes and attributes (ingroup/outgroup)
Multidisciplinary Collaboration (Carroll, 1999)	Internal consistency across vignettes: $r = 0.67-0.81$; within vignettes: $r = 0.42-0.98$; low reliabilities only for vignette #3, 7, 16 - rewording needed	Face validity (items drawn from the literature); construct validity (convergent & discriminant)	202 health care employees (nurses, doctors, allied health care workers, medical clerks, housekeepers, technicians, environmental service workers)	18 vignettes rated on a 5-point Likert scale; each vignette contained 4 questions; 4 subscales (general collaboration, patient care process, communication, team work)	Measures interactional factors of IP collaboration; items available from author
Forman & Nyatanga, 2001	Internal consistencies: curriculum: $r = 0.86$, social: $r = 0.72$, benefits: $r = 0.71$, pitfalls: $r = 0.90$	Content validity (derived from the literature)	Students (PT, OT, chiropractors, radiographers)	5-pt Likert scale; 4 scales (attitudes): curriculum, social, benefits, pitfalls	Measure attitudes to shared learning; items not published
Interprofessional Perception Scale (Golin & Ducanis, 1979, 1981)	Test-retest: $r = 0.72-0.81$	Content validity identified	29 allied health professionals (PT, medical technologists, nutritionists, respiratory therapists, OT, child care worker, SW, one unidentified)	15 items; true/false response to three levels of questions per item	2 different forms: perceptions of own profession & perceptions of another profession; also used in the field of education; items published
Harward, Tresolini, & Davis, 2006	Internal consistency: $r = 0.33-0.90$		605 medical students	5-pt and 6-pt Likert scale; 4 subscales (knowledge of professions, value of IP collaboration, leadership in IP teams, importance of different professionals in IP team; activities in IP team)	Measures attitudes; author developed; items published

(continued)

Appendix (Continued).

Measure /Authors	Reliability	Validity	Sample	Design	Comments
Hope, 2005			34 students (medicine, nursing, midwifery, OT, physician's assistant, PT, diagnostic medical imaging)	7-pt Likert scale; 5 subscales (team atmosphere, teamwork skills, multidisciplinary skills, interdisciplinary understanding, interdisciplinary attitudes)	Author developed; items not published; measures knowledge of other HCP, attitudes, interactional factors
Larkin & Callaghan, 2005		Content and face validity	165 health care employees (nurses, psychologists, OT, SW, psychiatrists, other, missing)	20 items; open and closed questions; most used yes/no response scale, one question a 5-pt Likert	Author developed; items not published; measures perceptions of IP collaboration, IP integration
Lewandowski & GlenMaye, 2002		Content validity (derived from the literature)	165 members of IP child welfare teams (SW, marriage and family, counseling, community members, education, law enforcement, law, medicine)	100 items; 57 items on 5-pt Likert scale	Author developed; sample items published; measures interactional factors, attitudes, systemic factors
Attitudes to Health Professionals Questionnaire (Lindqvist, Duncan, Shepstone, Watts, Pearce, 2005)	Internal consistency: $r = 0.87$ (0.58-0.93); test-retest: not reported for phase 2/3 revisions. Phase 1 was low.	Construct validity: constructs developed from "construct exercise" with various professionals; revised following initial testing; results of Phase 3 not yet reported	Stage 1: 190 1st year students; Stage 2: 160 1st year students (nursing, medicine, OT, pharmacy, midwifery, PT)	20 items; visual analogue scale, one construct with anchors at each end	Addresses attitudes toward various HCP (positive/negative poles); Items published

(continued)

Appendix (Continued).

Measure /Authors	Reliability	Validity	Sample	Design	Comments
Interdisciplinary Education Perception Scale (Luechr, Madsen, Taugher, Petterson, 1990)	Internal consistency ($r = 0.51-0.87$); (Factor 1: $r = 0.82$; Factor 2: $r = 0.56$; Factor 3: $r = 0.54$; Factor 4: $r = 0.52$) – lower reliabilities contributed to small number of items	Content-validated by 5 faculty in nursing and allied health; factor analysis	Pre-test: 27 senior students in OT; Normative sample: 143 undergraduate and graduate students, and administrators/clinicians (OT, Medical Records, ST/audiology, RT)	6-pt Likert scale; 18 items; 5–15 min administration time; 4 factors (competence & autonomy; perceived need for cooperation; perceptions of actual cooperation; understanding others' values)	Assesses attitudinal/affective change from interdisciplinary education; items published
Role Perception Questionnaire (generic) (MacKay, 2004)	Test-retest ($r = 0.7$)	Content validity verified through consultation with sample group	Purposive sample: 16 3rd-year students (midwifery, nursing, OT, PT, podiatry, prosthetics and orthotics, radiography, SW); numbers not provided for second sample from same population	10-pt scale; 20 items	Applicability to wide variety of professions; Items published; measures perceptions of different HCP
Revised Readiness for Interprofessional Learning Scale (McFadyen, Webster, Strachan, Figgins, Brown, & McKechnie, 2005, 2006)	Internal consistency: teamwork and collaboration: $r = 0.79-0.88$; roles & responsibilities: $r = 0.40-0.43$; negative professional identity: $r = 0.60-0.76$; positive professional identity: $r = 0.76-0.81$	Face, content, and construct validity based on Parsell & Bligh (1998, 1999)	555 students (dietetics, nursing, OT, PT, podiatry, prosthetics & orthotics, radiography, SW)	5-pt Likert scale; 19 items; 4 factors: teamwork and collaboration, roles & responsibilities, negative professional identity, positive professional identity	Measures readiness for IP learning; items published; factors revised from original version

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Appendix (Continued).

Measure /Authors	Reliability	Validity	Sample	Design	Comments
Modified Index of Interdisciplinary Collaboration (Oliver, Wittenberg-Lyles, & Day, 2006, 2007)	Internal consistency: $r = 0.935$; subscales: interdependence and flexibility: $r = 0.867$; newly created activities: $r = 0.767$; collective ownership: $r = 0.795$; reflection on process: $r = 0.791$	Face validity	95 hospice workers (nurse, SW, other clinical, chaplain, administrative, unknown)	5-pt Likert scale; 42 items	Theoretically grounded; wording to minimize response sets; measure of perceived collaboration; items published
Readiness for Interprofessional Learning Scale (Parsell & Bligh, 1998; 1999)	Internal consistency: $r = 0.9$	High content validity	120 undergraduate students (medicine, dentistry, PT, nursing, OT, orthoptics, therapy/diagnostic radiography)	5-pt Likert scale; 19 items; 3 factor scale (team-work and collaboration; professional identity; roles and relationships)	Measures readiness for IP learning, may not be applicable to other populations
Parsell, Spalding, & Bligh, 1998			Groups of 7 multiprofessionals (OT, orthoptists, dentists, nurses, medical students, therapy radiographers, PT)	70 true-false statements about the different professions; 1st & 3rd evaluations: 10 T/F statements; Mix of open and closed questions	Addressed changing attitudes, awareness of roles and teamwork; pre-post design; sample items published
UWE Interprofessional Questionnaire (Pollard, Miers, & Gilchrist, 2004, 2005)	IPQ test-retest reliability: $r = 0.77-0.86$; internal consistency: $r = 0.71-0.84$	Concurrent validity (RIPLS, IEPS, Interpersonal Communication Competence Scale); factor analysis	852 (2004 study), 723 (2005 study) students (nursing, allied health and social care professionals)	4-pt and 5-pt Likert scale; 4 subscales (Communication and Teamwork, Interprofessional Learning, Interprofessional Interaction, Interprofessional Relationships)	Measures interactional factors of IP collaboration; 3 versions of questionnaire; items published

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Appendix (Continued).

Measure /Authors	Reliability	Validity	Sample	Design	Comments
Ponzer, Hylin, Kusoffsky, Lauffs, Lonka, & Mattiasson, & Nordstrom, 2004		Content validity (educators from 4 departments involved in creation of questionnaire)	Teams of 5-7 students (surgical, nursing, OT, PT)	9-pt Likert scale; 3 sections: students' perceptions re: program goals, students' attitudes towards IP training, satisfaction with course	Measures attitudes towards IP learning
Tunstall-Pedoe, Rink, & Hilton, 2003			175 students (medicine, PT, radiography, nursing)	30 item semi-structured questionnaire; 5-pt Likert scale	Measures attitudes towards different HCP; items published
Wolf, 1999	Internal consistency: scale 2: r = 0.71, scale 3: r = 0.68, scale 4: r = 0.89, scale 5: r = 0.92	Content, construct, and face validity	409 allied health professionals (circulation technology, health information management, dietetics, medical technology, OT, PT, radiologic technology, respiratory therapy); stratified random sample	61 items; 5-pt and 6-pt Likert scales; 5 variables (orientation toward team problem solving, problem-solving confidence, preparedness for teams, attitude toward interdisciplinary teams, self-efficacy in contributing to teams)	Measures preparedness, inclinations, and attitudes towards IP teams; reverse scoring to minimize response set; items not published

HCP, healthcare professionals; OT, occupational therapy; PT, physical therapy; ST, speech therapy; SW, social work; RT, recreational therapy; ^aT, time; C, cohort.