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## **Instruments measuring interprofessional collaboration in healthcare – a scoping review**

**Running title:** Measuring interprofessional collaboration

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## **ABSTRACT**

Worldwide there is growing understanding of the importance of interprofessional collaboration in providing well-functioning healthcare. However, little is known about how interprofessional collaboration can be measured between different healthcare professionals. In this review, we aim to fill this gap, by identifying and analysing the existing instruments measuring interprofessional collaboration in healthcare. A scoping review design was applied. A systematic literature search of two electronic databases, Medline (PubMed) and CINAHL, was conducted in 03/2018. The search yielded 1020 studies, of which 35 were selected for the review. The data were analysed by content analysis. In total, 29 instruments measuring interprofessional collaboration were found. Interprofessional collaboration was measured predominantly between nurses and physicians with different instruments in various healthcare settings. Psychometric testing was unsystematic, focusing predominantly on construct and content validity and internal consistency, thus further validation studies with comprehensive testing are suggested. The results of this review can be used to select instruments measuring interprofessional collaboration in practice or research. Future research is needed to strengthen the evidence of reliability and validity of these instruments.

Keywords: interprofessional collaboration, healthcare, instrument, scoping review, psychometric testing

## Introduction

Interprofessional collaboration is important in providing well-functioning healthcare. The World Health Organization (World Health Organization, 2010), for example, emphasises cooperation between healthcare personnel as being an essential skill needed in everyday work with patients. The main objective of interprofessional collaboration is to develop multi-perspective working where power, goals, decision-making, knowledge and expertise are shared for high quality of care (Petri, 2010; Sargeant, 2009). The outcomes on the personnel level can be seen in positive work engagement and job satisfaction (Kaiser, Patras & Martinussen, 2018). To succeed, interprofessional collaboration requires understanding of different roles and respect for other professionals and it may positively affect health outcomes and patient safety (Walters, Stern & Robertson-Malt, 2016).

The advantages of interprofessional collaboration have been explored in diverse healthcare settings. Based on studies, interprofessional collaboration may improve patient care in multiple ways, for example in care of patients with type 2 diabetes mellitus (Conca et al., 2018), geriatric (Tsakitidis et al., 2016) and mental healthcare (Reeve, Cooper, Harrington, Rosbottom & Watkins, 2016). On account of that, it is important to identify instruments targeted to measure interprofessional collaboration between healthcare professionals. Such instruments could support skills and knowledge improvement in different healthcare settings to promote collaboration. Additionally, to increase patient safety, continuity of care and high-quality patient-centred healthcare, it is significant that interprofessional collaboration be integrated into daily practice. Healthcare reforms and limited resources require well-functioning interprofessional collaboration (Bilodeau, Dubois & Pepin, 2015; Lemetti,

Voutilainen, Stolt, Eloranta & Suhonen, 2017; Reeves, Lewin, Espin & Zwarenstein, 2011).

Consequently, the choice of the most accurate evaluation instrument is delicate.

## **Background**

There are some recent literature reviews with limited scope about instruments measuring interprofessional collaboration in healthcare settings (Bookey-Bassett, Markle-Reid, McKey & Akhtar-Danesh, 2016; Walters et al., 2016). Bookey-Bassett et al. (2016) reviewed and analysed published evidence of reliability and validity of existing instruments (n=5) measuring interprofessional collaboration at the team level. They focused interprofessional collaboration only in long-term disease management for community-living older adults. As a result, the Collaborative Practice Assessment Tool (CPAT) was considered the most appropriate to measure team level interprofessional collaboration in this context (Bookey-Bassett et al., 2016).

More broadly, Walters, Stern and Robertson-Malt (2016) evaluated and compared measurement properties of psychometrically tested and validated instruments (n=12) measuring collaboration within healthcare settings populated by a complex mix of participant types, such as healthcare professionals, the patients or non-professionals. The COSMIN (COnsensus-based Standards for the selection of health Measurement INstruments) checklist (Mokkink et al., 2010) was used to assess internal consistency, reliability, measurement error, content validity, construct validity, structural validity hypothesis testing, cross-cultural validity, criterion validity, responsiveness, interpretability, use of Item Response Theory (IRT or modern measurement theory analyzes representation of constructs through a latent variable which is assumed to underlie item responses, Reise, 2015) and generalizability. Instruments

had partial evidence of validity, particularly in terms of content, structural, concurrent and criterion validity, and further validation studies were commended (Walters *et al.*, 2016). They were designed for different functions, for example hospital settings, and different populations, for example for social workers, nurses and physicians. Depending on the measurement purpose, suggestions for instrument selection were made: team collaboration in general (e.g. the CPAT, Care Process Self-Evaluation Tool (CPSET) or Healthcare Team Vitality Instrument (HTVI), team collaboration between two levels of care (Interprofessional Collaboration between clinical professionals at Different Levels of Care (IPC-DLC), professionals' beliefs, behaviour and attitudes towards collaboration (the Interprofessional Socialisation and Valuing Scale (ISVS), Doctor's Opinions on Collaboration (DOC), collaborative relationship (Assessment of Interprofessional Team Collaboration Scale (AITCS), collaboration between multiple groups (Multiple Group measurement Scale (MGMS) and internal participation from the team members and the patient's perception (Internal Participation Scale, IPS, Walters *et al.*, 2016). However, the review focused only on validation studies measuring collaboration *in general*, thus probably omitting some potential instruments *measuring interprofessional collaboration*.

Variation in instruments is diverse and instruments' properties measuring interprofessional collaboration are fragmentary and indefinite. Interprofessional collaboration is projected to be increasingly important in the future because of healthcare reforms and restructuring of care. However, previous reviews have focused on validity and reliability of instruments measuring general collaboration or team level interprofessional collaboration in a certain area of healthcare (care of older people, Bookey-Bassett *et al.*, 2016; Walters *et al.*, 2016). A review focusing on the measurement of interprofessional collaboration *in the wider scope of healthcare is* lacking. Thus, in this study, interprofessional collaboration is type of

interprofessional work which involves different health and social care professions who regularly come together to solve problems or provide services (Barr, Koppel, Reeves, Hammink & Freeth, 2005).

The aim of this review was to identify and analyse the existing instruments measuring interprofessional collaboration of professionals in healthcare. The research questions were:

- 1) What are the measurement objectives of instruments measuring interprofessional collaboration?
- 2) What are the psychometric properties of the instruments?

## **Methods**

A scoping review was done (Arksey & O'Malley, 2005; Rumrill, Fitzgerald & Merchant, 2010). Scoping reviews map and summarise a range of evidence to convey the breadth and depth of a field (Levac, Colquhoun & O'Brien, 2010). The review followed predefined, but unpublished, protocol agreed in the research team. *The Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) Extension for Scoping Reviews 2018 (Tricco et al., 2018) was used guide reporting.

### ***Eligibility criteria***

The inclusion criteria were 1) empirical article, 2) focus on measurement of interprofessional collaboration between at least two different professionals, 3) healthcare context, and 4) articles written in the English language. The articles were excluded if they described 1) collaboration within one professional group, 2) theoretical and review papers, 3) study of healthcare students, or 4) research collaboration between researchers in healthcare settings.

### ***Information sources and search***

A systematic literature search of two electronic databases, Medline (PubMed) and CINAHL, was conducted from the earliest until 6.3.2018 (Figure 1) by using the following search phrases: (interprofessional OR multiprofessional OR multidisciplinary OR interdisciplinary) AND (collaborat\* OR cooperat\*) AND (instrument OR scale OR tool OR index OR questionnaire OR measure OR measurement) AND (healthcare OR "health care"). The search was limited to title/abstract level.

*Insert Figure 1. here*

### ***Selection of sources of evidence***

The selection of sources of evidence was conducted independently by two researchers (JP, MSt). They evaluated the sources systematically against the inclusion and exclusion criteria first in title and abstract level and then on full text level. After each phase the researchers discussed their selections pursuing consensus. In the cases of disagreement third researcher (HL-K) evaluated the data and the consensus was achieved

### ***Data charting process and data items***

Data from the articles were charted by JP and MSt to a separate spreadsheet. The content of the spreadsheet was agreed within the research team. The spreadsheet included the following information: authors, year of publication, country of origin, purpose of the study, participants, sample size, setting, methods, description instruments (measurement objective, number of items, subscales, scoring), and the main results related to the instrument's psychometric



properties. Original terms as indicated by the Authors were used, omitting any interpretations during the data collection.

### ***Synthesis of results***

The content of the instruments were analysed with content analysis (Graneheim & Lundman, 2004). The psychometric properties of the instruments were analysed following the methodological criteria reported by Streiner and Norman (2003). The criteria included assessment of the reliability (test-retest/stability, internal consistency, responsiveness) and validity (face, content, construct, predictive, criterion, discriminant, convergent, divergent). In addition, original authors' discussion of methodological issues was analysed. The analysis was done on descriptive level where reporting of reliability and validity testing was considered sufficient. The analysis of achievement of a standard for psychometric rigour was omitted.

## **Results**

### ***Selection of sources of evidence***

The search produced 1020 hits (Medline/PubMed n=802, CINAHL n=218). After duplicates were removed a total of 1012 hits were evaluated. Firstly, the titles and abstracts of the studies were evaluated excluding 956 articles. Secondly, the full texts of the articles (n=64) were inspected and 29 studies were excluded because of: focus on teachers' and students' collaboration (n=8), collaboration within one profession (n=8), team training on a specific issue (n=4), theoretical paper (n=4). Finally, 35 articles were selected for the analysis, including 29 instruments.

### ***Characteristics of source of evidence***

The studies (n=35) were published between 2006 and 2018 (Table 1), mostly conducted in Europe (Belgium n=2; Denmark n=1; France n=1; Germany n=2; Italy n=2; the Netherlands n=3; Norway n=1; Sweden n=2; Switzerland n=1; United Kingdom n=1). Part of the studies were conducted in North America (United States n=7; Canada n=5) and in Asia (Japan n=1; Philippines n=1; Singapore n=1) while others studies were conducted in the Middle East (Iran n=2; Iraq n=1) and in Australia (n=1). The total number of participants in the studies was 13,225, ranging from 24 to 2802. The response rate in the studies varied from 13 to 100%.

The studies were conducted predominantly in hospital and healthcare centre settings (Table 1), measured between numerous healthcare professionals. Interprofessional collaboration was mostly measured between nurses and physicians (n = 26) alone or along with another professionals, e.g. social workers, pharmacists and allied health professionals. Some instruments were designed for a specific healthcare setting and healthcare professionals and some instruments were designed for general use in healthcare.

*Insert Table 1. here*

### ***Measurement objectives of instruments measuring interprofessional collaboration***

The literature search traced 29 instruments measuring interprofessional collaboration (Table 2). The reported measurement objectives were collaborative behaviour (n=14), professionals' attitudes (n=4) or perceptions (n=4) about interprofessional collaboration and team vitality (n=1), readiness for change (n=1) and competence (n=1). In six instrument descriptions, the

names of the instrument and measurement purpose were lacking, thus omitted from the analysis and Table 2.

The content of the instruments (Table 2) focused on professionals, teamwork and communication, supportive factors, collaboration and conflicts. In the professionals category, the content areas were attitudes towards each other (Koo et al., 2014), decision making (Jafary, Alavi, Irajpour & Mehrabi, 2017), competency (Puskar et al., 2016), and role expectations (Jafary et al., 2017). The teamwork and communication category included interaction (Anthoine, Delmas, Couterut & Moret, 2014; Braithwaite et al., 2012; Bruner, Waite & Davey, 2011; Kenaszuk, Reeves, Nicholas & Zwarenstein, 2010; Morin, Desrosiers & Gaboury, 2017; Riggall & Smith, 2015). Supportive factors as instrument content were organisational support (Schouten, Grol & Hulscher, 2010; Van Den Bulcke et al., 2016), leadership (Riggall et al., 2015), team efficiency (Robben et al., 2012; Van Dijk-de Vries et al., 2016) and knowledge (Abramsen, Nørgaard & Draborg, 2017). Collaboration consisted of contents like attitudes (Bode, Giesler, Heinzmann, Krügger & Straub, 2016; Braithwaite et al., 2012), partnership (Orchard, King, Khalili & Bezzina, 2012), engagement (Bruner et al., 2011) and motivation (Ødegård & Strype, 2009). The conflicts category included conflict evaluation (Rothermund et al., 2018) and management (Schweizer, Morin, Henry, Bize & Peytremann-Bridevaux, 2017).

*Insert Table 2. here*

### ***Psychometric properties of the instruments***

All instruments were self-administered and targeted to healthcare professionals, for the most part to nurses and physicians. The number of items ranged from 9 to 60 (mean 26). The number of instruments subscales varied from 1 to 12. In seven studies, the number of subscales was not reported. Response scale was most often Likert type, generally a 5-point scale. In total, nine instruments were developed for the particular study; all others were using previously developed instruments.

The psychometric properties of the instruments were reported with wide variety (Table 2). In terms of validity, the most common reported property was construct and content validity, whereas divergent validity, concurrent and discriminant validity were seldom reported. Some studies reported values for face and convergent validity. None of the studies pointed out predictive validity. Several studies referred to previous studies where validity of particular instrument was reported. A total of five articles lacked the description of validity in the particular study.

Reliability was most often reported with internal consistency, particularly with Cronbach's alpha values. Internal consistency was mainly on a satisfactory level (indicated with Cronbach's alpha) ranging from 0.62 to 0.98. Stability and item analysis were reported in some studies, (n=3, n=3, respectively). Stability for the Readiness for Interprofessional Learning Scale (RIPLS, Pype & Deveugele, 2016), Assessment of Interprofessional Team Collaboration Scale (AITCS, Hellman, Jensen, Orchard & Bergström, 2016) and the University of the West of England Interprofessional Questionnaire (Bruner et al., 2011) were evaluated with the test-retest method and demonstrated consistency of measurement results over time. Item analysis for the Jefferson Scale of Attitudes towards Physician–Nurse Collaboration (JSAPNC) and Interprofessional Collaboration Measurement Scale consisted

of item-to-total correlations, ranging generally from 0.22 to 0.76, supporting the inter-item relationships (Alcusky et al., 2016; Kenaszchuk et al., 2010; Vegesna et al., 2016).

Responsiveness was reported in one study (Koo et al., 2014). A total of 6 articles did not report any issues related to reliability. In a few articles (n=11), the authors referred to previously reported reliability scores and used them as an indicator about reliability.

Methodological discussion, in general, was reported in the majority of the articles (n=33). The main points of the methodological discussion were challenges in data collection (e.g. timing, recruitment, and length), sampling, response rate (e.g. number of responses) and generalisability of the results. Instrumentation received (e.g. number of items, time to respond) little attention and psychometric properties (e.g. content validity, internal consistency and construct validity) of the instruments were rarely discussed.

## **DISCUSSION**

### *Summary of evidence*

The aim of this review was to identify and analyse the existing instruments measuring interprofessional collaboration in healthcare. This study identified 29 instruments designed to assess interprofessional collaboration in healthcare between the years 2006 and 2018. The majority of the studies were conducted in the last two decades (2010–2018). This is, however, an indication that interest in interprofessional collaboration has increased during recent years.

This review produced a large and comprehensive picture of instruments measuring interprofessional collaboration in healthcare accumulating information gathered in the previous reviews (Bookey-Bassett et al., 2016; Walters et al., 2016). The literature search and its analysis conducted in this review were justified, as they identified many rather new instruments (Table 1). The review produced new information, particularly about measurement of interprofessional collaboration in healthcare. This new information reinforces and updates the previous knowledge in the field.

It is clear that measurement of interprofessional collaboration has been of interest to researchers. Interprofessional collaboration in healthcare settings seems to be globally relevant as studies have been produced extensively in different countries. However, the number of developed instruments is surprising because the measurement objective of these instruments is rather identical, aiming to measure almost the same issues. Moreover, the contents of the instrument seem to focus on similar areas such as professionals, teamwork and communication, supportive factors, collaboration and conflicts. It seems that there is considerable measurement overlap, on subscale and item levels, between existing instruments. Moreover, an overarching theoretical construct related to instruments was not found. Therefore, the rationale for the development of all these instruments remains unclear.

The instruments focused generally on evaluating interprofessional collaboration between nurses and physicians, the majority groups in healthcare. In future, due to changing healthcare environments and patients with complex health problems, different healthcare professionals, e.g. allied health professionals, should be increasingly included in the studies. Generic instruments measuring the interprofessional collaboration between different participants on different healthcare organisation levels could be usable in the future.

A variety of psychometric properties have been estimated for some instruments. For example, RIPLS and JSAPNC have undergone large patterns of validity and reliability testing with different samples. Instead, some instruments were used in single studies, during time period 2011–2016 and demonstrated limited evidence of validity and reliability. As instrument development and testing is a lengthy process (DeVon et al., 2007), their further testing might be still under progress.

Methodological quality of instruments was variable, revealing major gaps in psychometric properties. A minor part of the instruments partly fulfilled the standard psychometric criteria (Streiner & Norman, 2003). Internal consistency was often reported, which is in line with a previous study (DeVon et al., 2007). Only a few articles were reporting testing of construct validity. Criterion validity and reliability testing in terms of stability was rare. Only one instrument (Koo et al., 2014) assessed responsiveness. Responsiveness is a crucial ability because it demonstrates instrument's capacity to detect changes, in this case in interprofessional collaboration. Responsiveness can be tested with longitudinal study designs (Mokkink et al., 2010). Moreover, inter-rater and intrarater reliability assessment or hypothesis testing as a component of construct validation would provide crucial evidence of reliability. The use of item response theory would also produce new approaches and results of instrument testing.

The instruments identified in this review have their strengths and weaknesses related to validity and reliability which need to be taken into consideration when deciding on their use. Based on evidence of validity, reliability and measurement purpose, there are some potentially usable instruments for measuring interprofessional collaboration. For example, when measuring participants' perceived attitudes about interprofessional learning RIPLS (Pype & Deveugele, 2016) could be used. To examine attitudes towards interprofessional

collaboration JSAPNC (Zheng, Sim & Koh, 2016) could be potential. To assess interprofessional collaboration in hospital settings Communication and Sharing Information (CSI) scale could be possible. Instruments could be also used together to measure extensively different dimensions or aspects of interprofessional collaboration.

In conclusion, studies indicated diffuse evidence of content and psychometric properties of the instruments. This review provided useful information for the selection of instruments measuring interprofessional collaboration. To provide valid and reliable results, instrumentation requires systematic testing, and comprehensive evaluation with different samples. In future, growing awareness of including patients and families in collaborative healthcare, and including patients in the instrument development process and validation would enlarge the measurement properties.

### ***Limitations***

The strength of this review is its broad view of measurement of interprofessional collaboration in healthcare. Previous reviews concentrated on a focused area and identified attributes of collaboration in care of older people (Bookey-Bassett et al., 2016) or measurement properties of collaboration (Walters et al., 2016).

The search produced a wealth of citations of which the majority were discarded because they focused on collaboration within one professional group or collaboration in educational settings. The search was not narrowed by a specific time frame, which enabled the investigation of potential trends with a long time interval. Two researchers conducted the selection of sources of evidence in accordance with inclusion and exclusion criteria which were determined beforehand. Such approach is a major strength in handling the data. All discrepancies were discussed within the research team to achieve consensus. The data



charting process and synthesis of the results were conducted by two researchers (JP, MSt) working independently. The separate synthesis of the results were checked and confirmed by a third researcher (HL-K) and after this in the research group, thus ensuring the validity of the findings. In the analysis, authors' original expressions were used without any interpretations. Altogether, the review process followed a universally agreed protocol (PRISMA Extension for Scoping Reviews 2018, Tricco et al., 2018) to ensure quality of reporting.

This review has some limitations related to selection of search terms, the search itself and data analysis, which need to be taken into consideration when interpreting the results.

Interprofessional collaboration has many synonyms. To overcome this, search terms that best cover the interprofessional collaboration were used. Moreover, to identify studies measuring interprofessional collaboration, predefined search terms including collaborative, measurement and healthcare perspectives were used. The search terms and phrases were agreed in the research team to ensure the accuracy of the search. Due to a strictly focused search phrase, some studies could have remained undetected. However, those search terms applied here describe the study topic and were considered wide enough to provide large coverage in the research topic. Search terms compared to previous reviews (Bookey-Bassett et al., 2016; Walters et al., 2016) were mainly similar where some measurement-specific terms were added. However, the current search produced 35 articles including same instruments as identified in previous reviews (e.g. Bookey-Bassett et al., 2016) indicating acceptable targeting.

The literature search was conducted only on two scientific databases (PubMed and CINAHL). However, these databases are considered to cover central and relevant research evidence in healthcare (Subirana, Solá, García, Gich & Urrútia, 2005). A manual search of reference lists would have probably identified some more studies, however due to limited

resources manual searching was omitted. There may have been some empirical studies that were not captured by the search. Our search was limited to title and abstract levels, meaning that search terms need to be identified on these levels. Some studies might have been missed because of this limitation. For example, a study in which the title consists of a definition of collaborative parties (e.g. nurse and physician), might be left undetected. On the contrary, in the abstract it is expected to have all relevant terms describing interprofessional collaboration in healthcare. The literature search for individual instruments to detect testing history was not conducted, limiting the generalisability of results in psychometric testing. However, some instruments were used in several studies identified in this review, indicating wide coverage of the literature search.

The psychometric properties of the instruments were analysed against the traditional methodological criteria by Streiner and Norman (2003). The results need to be interpreted with caution although the psychometric properties were assessed the demonstration of psychometric rigour was not assessed. Use of a pre-existing screening tool or checklist (e.g. COSMIN guideline, Mokkink *et al.*, 2010) would have provided in-depth systematic analysis of the psychometrics. However, the reporting of the psychometric properties was fragmented, impeding profound methodological analysis.

## **Conclusions**

This review identified several rather new instruments measuring interprofessional collaboration. Instrument contents were somewhat similar and differences in measurement purposes were uncertain. The review produced partial evidence of validity and reliability of these instruments. The majority of the instruments have the potential to be considered for use in clinical settings. However, psychometric testing was conducted with traditional means,

thus further validation studies with more advanced testing methods (such as modern test theory approaches like Rasch analysis) are suggested. This information can be used in assessing and selecting a proper instrument for certain settings and situations. To strengthen international scientific research in this field, it would be beneficial to use instruments with strong psychometric evidence. This would provide comparable data from different countries and settings to promote and analyse further interprofessional collaboration in healthcare.

### **Declaration of interest**

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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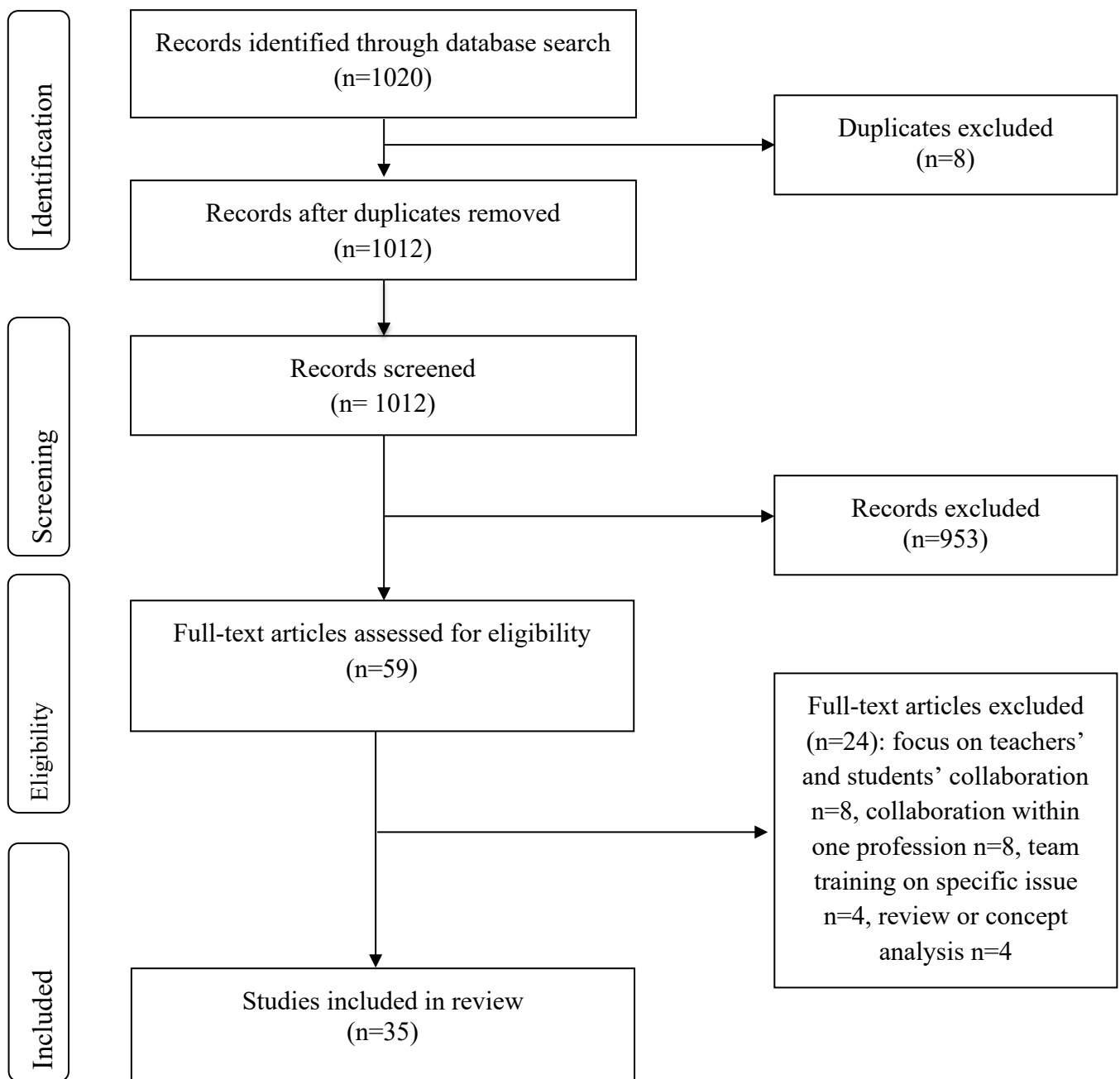


Figure 1. Flow diagram of study selection



Instrument, author, year	Data collection methods			Data analysis methods		Settings							Informants							Response rate				
	Interview	Questionnaire	Intervention	Narrative analysis	Statistical analysis	Educational facility	Home care or home	Hospital	Community	Rehabilitation	Medical Homes	Healthcare centre	Association	Nurse <sup>1</sup>	Allied health staff	Pharmacist	Managers/leaders	Physician <sup>2</sup>	Psychologist		Dentist <sup>4</sup>	Osteopaths	Special educators	technical staff
<b>11. Interprofessional Attitudes Questionnaire (IAQ)</b> , Robben et al., 2012	x	x			x							x		x	x	x		x						67.2
<b>12. Interprofessional Collaboration Measurement Scale</b> , Kenaszchuk et al., 2010		x						x						x	x			x						
<b>13. Interprofessional Education Perspective Questionnaire (IEPQ)</b> , Koo et al., 2014		x			x			x							x			x						NR
<b>14. the Interprofessional Practice and Education Quality Scales (IPEQS)</b> , Van den Bulcke et al., 2016		x	x	x				x						x	x			x	x					65; 75
<b>15. Jefferson Scale of Attitudes toward Physician–Nurse Collaboration (JSAPNC)</b> , Zheng et al., 2016		x			x							x		x				x						39
Vegešna et al., 2016		x			x							x		x				x						51.5
Alcusky et al., 2016		x			x						x			x				x						67.4
Jafary et al., 2017		x			x			x						x				x						100
<b>16. Kristensen and Nohr's questionnaire</b> , Abrahamsen et al., 2017		x			x			x						x	x		x	x	x			x		50.7
<b>17. Nurse–Physicians Collaboration Scale (NPCS)</b> , Caricati et al., 2015		x			x			x						x				x						64.2
<b>18. Perception of Interprofessional Collaboration Model Questionnaire (PINCOM-Q)</b> , Ødegård & Strype, 2009		x			x							x		x	x			x	x			x		86
<b>19. Physician–Pharmacist Collaborative Instrument (PPCI)</b> , Al-Jumaili et al., 2016		x			x			x								x		x						81.5
<b>20. Readiness for Interprofessional Learning Scale (RIPLS)</b> , Braithwaite et al., 2012		x										x		x	x		x	x						31.4
Mowat et al., 2017	x	x		x	x	x								x	x			x		x				58; 48;
Pyper & Deveugele, 2016		x			x			x						x				x						25

Instrument, author, year	Data collection methods			Data analysis methods		Settings							Informants							Response rate					
	Interview	Questionnaire	Intervention	Narrative analysis	Statistical analysis	Educational facility	Home care or home	Hospital	Community	Rehabilitation	Medical Homes	Healthcare centre	Association	Nurse <sup>1</sup>	Allied health staff	Pharmacist	Managers/leaders	Physician <sup>2</sup>	Psychologist		Dentist <sup>4</sup>	Osteopaths	Special educators	technical staff	
extended version of RIPLS, Reid et al., 2006		x			x									x	x	x		x					x	68.3	
<b>21. Team Skills Scale (TSS)</b> , Robben et al., 2012	x	x			x									x	x	x		x						67.2	
<b>22. TeamSTEPPS Teamwork Perceptions Questionnaire (T-TPQ)</b> , Riggall et al., 2015		x	x	x	x			x						x	x			x							
Costa & Lusk, 2017		x	x		x					x				x	x		x	x	x						
<b>23. University of the West of England Interprofessional Questionnaire</b> , Bruner et al., 2011		x			x									x	x		x			x			x	68	
<b>Instruments without name</b>																									
24. Instrument by Bode et al., 2016		x			x			x						x	x			x	x					x	
25. Instrument by Hashemian et al., 2016		x			x				x							x		x							72.6
26. Instrument by Morin et al., 2017		x			x				x									x			x				13; 17; 42
27. Instrument by Nilsson et al., 2012		x		x	x			x							x			x	x			x			82
28. Instrument by Rothermund et al., 2018		x			x										x			x							30
29. Instrument by Schouten et al., 2010		x			x									x	x			x							95

1) Nurse = nurse assistant, respiratory nurse, practical nurse, 2) Physician = general practitioner, radiation oncologist, family physicians, medical resident, pulmonologist, surgeon, orthopaedic surgeons, psychiatrist, 3) Therapist = marriage and family therapist, radiation therapist, recreation therapist, psychotherapist, child and youth workers, therapy assistant, 4) Dentist = dental provider, dental hygienist









<b>23. University of the West of England Interprofessional Questionnaire</b> Bruner et al., 2011	to measure providers' communication, teamwork skills, and attitudes towards professional collaboration	36	1) communication and teamwork, 2) the interprofessional learning, 3) the interprofessional interaction, 4) the interprofessional relationships	4 to 5 Likert-type scale: strongly agree; strongly disagree					X		X		X	X			X		X
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X=reliability/validity addressed/reported in the article, NR=not reported