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The HCAHPS Survey as a Potential Tool for Measuring Organizational Interprofessional Competency at American Hospitals Nationwide: A Content Analysis Study of Concept Validity

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Abstract

INTRODUCTION Interprofessionalism is grounded in a core set of guiding principles for educational and practice initiatives among healthcare professionals. It has been shown to improve proximal outcomes, such as patient satisfaction. However, the link between interprofessionalism and more distal outcomes, such as patient health outcomes, has proven difficult to demonstrate quantitatively.

METHODS Our research team examined the concept validity of an existing tool to determine its feasibility to serve as a potential proxy measure of organizational interprofessional competency for use in large-scale quantitative research. We compared the Core Competencies for Interprofessional Collaborative Practice expert panel report to the Hospital Consumer Assessment of Healthcare Providers and Systems survey, using manifest content analysis.

RESULTS 61% of the HCAHPS survey questions capture the domains of interprofessional competency identified in the expert panel report, and 57% reflect multiple competency domains simultaneously.

CONCLUSION We recommend that the HCAHPS survey questions identified here be examined quantitatively to determine their psychometric validity as a proxy measure of organizational interprofessional competency.

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Implications for Interprofessional Practice

- Determine the concept validity of the HCAHPS survey as an existing instrument that may be able to measure organizational interprofessional competency at American hospitals nationwide
- Link interprofessional competency with quality of care and patient health outcomes
- Facilitate the evaluation of the effectiveness of interprofessional interventions within American hospitals nationwide

Introduction

Interprofessionalism, operationalized as interprofessional education or interprofessional practice, occurs “when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes” or “when multiple health workers from different professional backgrounds work together with patients, families, carers and communities to deliver the highest quality of care,” respectively (World Health Organization, 2010). Interprofessionalism is important in maximizing patient-centered care via collaborative practice initiatives and educational interventions (Herbert, 2005; Interprofessional Education Collaborative Expert Panel, 2011). It is thought to not only enhance workplace outcomes, such as provider satisfaction, but more importantly, to improve patient outcomes. The latter includes both cognitive outcomes, such as greater satisfaction with the care received, as well clinical outcomes, such as increased quality of care and decreased morbidity and mortality.

As several recent systematic reviews demonstrate, there is indeed a causal relationship between interprofessionalism and non-clinical outcomes, such as improved patient care management infrastructures, increased collaborative team behavior, and higher patient satisfaction with care (Reeves, Perrier, Goldman, Freeth, & Zwarenstein, 2013; Reeves et al., 2008; Zwarenstein, Goldman, & Reeves, 2009), as well as better educational outcomes for healthcare professionals and improved attitudes and perceptions of interprofessional education (Lapkin, Levett-Jones, & Gilligan, 2011; Reeves et al., 2016). While many studies have devised measures of interprofessionalism at the individual or team level (Archibald, Trumpower, & MacDonald,

2014; Chiu, 2014; Dominguez, Fike, MacLaughlin, & Zorek, 2015; Dougherty, 2016; Dow, DiazGrados, Mazmanian, & Retchin, 2014; Fike et al., 2013; Godley & Russell-Mayhew, 2010; Tilden, Eckstrom, & Dieckmann, 2016; Zabar et al., 2016; Zorek et al., 2016), there is no validated quantitative measure of interprofessionalism at the organizational level that is rooted in interprofessional competencies (IPC). Consequently, there is insufficient quantitative evidence to demonstrate that greater organizational IPC leads to better patient health outcomes (Brandt, 2014).

Organizational IPC can be defined as those that are “necessary to provide a supportive environment for patient-centered interprofessional practice” (Tataw, 2011). There is evidence that interprofessional organization (IPO) interventions can influence the context under which teams work in the acute care setting (Reeves et al., 2011). Studies have identified a number of organizational factors that can influence collaborative practice, including whether the organization is patient-centered, whether it creates a culture of safety rather than blame, whether it supports individual and team learning (Ekmekci et al., 2015), and whether it embraces institutional policies that are prohibitive to team-based care (Jadotte, 2016), all of which may impact the ability of teams, as well as organizations as a whole, to effectively provide collaborative care. Yet to date there are no tools to measure whether IPO interventions truly impact IPC at the organizational level.

This study is an initial exploration into the feasibility of using the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey (Giordano, Elliott, Goldstein, Lehrman, & Spencer, 2010; Goldstein, Farquhar, Crofton, Darby, & Garfinkel, 2005) to measure organizational IPC as defined by

the Interprofessional Education Collaborative Expert Panel (Interprofessional Education Collaborative Expert Panel, 2011). This survey was developed for nationwide use by the Agency for Healthcare Research and Quality (AHRQ) and the Centers for Medicare & Medicaid Services (CMS) to measure and report patients' experiences in the acute care setting (Goldstein et al., 2005).

HCAHPS is a standardized tool that provides comparative performance information on hospitals to the public. It consists of 32 questions, including items on communication with nurses and doctors, responsiveness of hospital staff, pain management, communication about medicines, and discharge information (Goldstein et al., 2005). Participation by hospitals is voluntary, and the survey is administered either by approved vendors or self-administered by hospitals via mail, telephone or both (Goldstein et al., 2005). Our findings in this study on the concept validity and feasibility of this tool, as a potential measure of IPC at the hospital level, have substantial implications for all stakeholders involved in healthcare policy, professional education, clinical practice, and patient care.

Literature Review

Several models of interprofessional education and collaboration have been developed, and there is strong evidence that interprofessionalism influences healthcare professionals' educational outcomes, as well as non-clinical patient outcomes (Lapkin et al., 2011; Reeves et al., 2013; Reeves et al., 2008; Zwarenstein et al., 2009). Although interprofessionalism has been championed elsewhere (Barr, Freeth, Hammick, Kopel, & Reeves, 2006; Herbert, 2005), it is relatively still in its infancy in the United States (Brandt, 2014). However, in 2009, the American Association of Colleges of Nursing, the American Association of Colleges of Osteopathic Medicine, American Association of Colleges of Pharmacy, American Dental Education Association, Association of American Medical Colleges and the Association of Schools of Public Health convened the Interprofessional Education Collaborative Expert Panel (IPEC), charging it with the task of identifying core competencies for interprofessional education and collaborative practice.

In 2011, this expert panel established a common framework for the evaluation and implementation of interprofessional education and practice in the United States (Interprofessional Education Collaborative Ex-

pert Panel, 2011). The panel provided a clear definition of interprofessional competency in the biomedical and health science professions. Four competency domains were identified: values and ethics for interprofessional practice, roles and responsibilities, interprofessional communication, and teams and teamwork. Each of these domains contains a set of more detailed general competency statements (Interprofessional Education Collaborative Expert Panel, 2011).

While these competency domains and statements provide much needed guidance for the development of new programs, and for the evaluation and improvement of existing interprofessional education and collaborative practice initiatives, there are currently few validated tools that measure interprofessionalism based on these newly established competencies. A search of the literature via Medline and Google Scholar, using key words such as "interprofessional," "competency," and "instrument" or "survey," was undertaken to identify these tools. The results of this search show that there is currently wide variation in both the scope and validity of the instruments that have so far been developed to measure the IPCs as defined in the IPEC (2011) report.

One study described the development and validation of the Performance Assessment Tools for Interprofessional Communication and Teamwork (PACT), which was guided in part by the IPEC competency domains (Chiu, 2014). Unfortunately, this tool is limited to only the domains of teamwork and communication, suggesting that it fails to capture the full construct of interprofessionalism. Another instrument, the Interprofessional Collaborative Competency Attainment Survey (ICCAS), measured this construct using more than the four established IPEC competency domains (Archibald et al., 2014), suggesting that it may potentially be quantifying another construct altogether.

Many of the current tools focus on measuring the perceptions of healthcare professionals and students on the IPCs. One example is the Student Perception of Physician-Pharmacist Interprofessional Clinical Education (SPICE) tool, which has been thoroughly validated (Dominguez et al., 2015; Fike et al., 2013; Zorek et al., 2016). Similarly, the Assessment for Collaborative Environment (ACE-15) tool is designed to measure "interprofessional teamness," using a 15-item survey questionnaire (Tilden et al., 2016). There are two major challenges that limit the utility of both of these tools as measures of IPC: not only do they rely on the

perceptions of the learner to evaluate IPC, which may not be the most objective measure of this construct with regards to competencies and behaviors in practice, but similar to the PACT tool, they also only cover a limited number of the four IPC domains (Fike et al., 2013; Tilden et al., 2016; Zorek et al., 2016).

Other tools have measured all four IPCs specifically as defined by the IPEC (2011) report, yet even they face a number of limitations. For example, one study measured the change in the perceptions of students from three healthcare professions on interprofessional collaborative practice (Sevin, Hale, Brown, & McAuley, 2016), using an instrument containing the IPEC general competency statements as survey items (Dow et al., 2014). Although this instrument captures all four IPEC competency domains, it still relies on the perceptions of the learner to measure the collaborative competencies. Another study developed the Resident Physician Interprofessional Collaboration Skills tool, which seeks to measure all four domains of IPC in the context of physician-nurse interactions (Zabar et al., 2016). While this instrument does not rely on self-report as a measure of the IPCs, its principal limitation is that it is currently unclear whether it has been psychometrically validated.

Finally, one study examined the psychometric properties of all the general competency statements and domains as presented in the IPEC (2011) report, and it suggests that these statements do load onto the domains as presented while making some recommendations for minor revisions (Dougherty, 2016). Unfortunately, the full results of this study are embargoed and unavailable until the year 2019: thus it is unclear whether the instrument developed in this study is useful for measuring self-perception of learners or their performance as determined by an external evaluator.

In summary, all the existing instruments to measure IPC identified here have serious limitations, all of which can be classified as follows: some did not cover all the competency domains identified by the IPEC (Chiu, 2014; Fike et al., 2013; Tilden et al., 2016; Zorek et al., 2016) or went beyond them (Archibald et al., 2014), some relied on the perceptions of healthcare professionals or students regarding their own IPC (Dominguez et al., 2015; Dow et al., 2014; Fike et al., 2013; Tilden et al., 2016; Zorek et al., 2016), and some are either not yet validated (Zabar et al., 2016) or their utility is unclear due to the lack of availability of full study results (Dougherty, 2016). In addition, no

instruments that can measure IPC at an organizational level have been identified in the literature to date. Compared to existing instruments, HCAHPS, as a validated measure of patient perceptions of healthcare professionals and hospitals as a whole, may possess complementary strengths and may provide a contrasting view to help address all these challenges to the objective measurement of IPC.

Our study sought to address these fundamental challenges by exploring the feasibility of using HCAHPS as a tool to measure these newly defined IPCs. To undertake this task, our study was guided by the Institute for Healthcare Improvement's Triple Aim conceptual framework, whose stated goal is to help establish the optimization of health, care and costs as the three objectives that must be pursued simultaneously in any healthcare improvement endeavor, by starting with the individual experience of care and "scaling up" (The Institute for Healthcare Improvement, 2009). This framework also identifies the design and coordination of healthcare as being fundamental to this process. Interprofessionalism is a key intervention that has empirically been proven capable of changing these aspects of healthcare (Lapkin et al., 2011; Reeves et al., 2013; Reeves et al., 2008; Zwarenstein et al., 2009).

We chose to examine HCAHPS not only because it measures the patient experience of care, but because it has also recently been identified as a reliable and valid source of data on the patient experience of care (The Institute for Healthcare Improvement, Stiefel, & Nolan, 2012). Moreover, the National Center for Interprofessional Practice and Education (NCIPE) has recently called for the use of national database systems and evaluation of the links between interprofessional education and collaborative practice and health and community outcomes (Brandt, 2014). The center identified several existing tools that could potentially be used to measure and quantify interprofessionalism and potentially allow exploration of these links (National Center for Interprofessional Practice and Education, 2013). One of the identified tools is the HCAHPS survey.

Furthermore, in conceptualizing this study, it became immediately clear that the principles that guided the development of the HCAHPS survey and the IPEC consensus document were highly congruent. In fact, we discovered that the development of both documents was fundamentally inspired by the Institute of Medicine 2001 Report on *Crossing the Quality Chasm*

(Institute of Medicine, 2001; Interprofessional Education Collaborative Expert Panel, 2011; Keller et al., 2005). Both documents are grounded in the idea that healthcare should be safe, high quality, accessible, and patient-centered. Table 1 illustrates this point by matching the latent domains of the HCAHPS survey (Keller et al., 2005; O'Malley et al., 2005) with the broadly similar guiding principles of the IPEC (2011) document. It is on this basis that we embarked on a qualitative exploratory study of the feasibility of using the HCAHPS survey as an instrument to quantify organizational IPC, by evaluating the congruence between HCAHPS survey questions and IPEC competency statements as a measure of the concept validity of the HCAHPS instrument for the construct of interprofessionalism.

When developing a new measurement tool, an existing instrument (in this case HCAHPS) can be adapted or modified. Although the development of a new instrument is often ideal, adaptation and validation of an existing instrument saves considerable time and resources (Rothman et al., 2009). Successful adaptation establishes consistency between the conceptual framework of the existing instrument and the problem under study, critically analyzes items for content validity, establishes relationships between items, domains, scales and subscales and validates a new use of the instrument (Rothman et al., 2009). Having determined that there is consistency between the conceptual frameworks of HCAHPS and IPEC, our task in this study was to critically analyze the survey items for content validity. Qualitative methods can aid in the

Table 1. Comparison of the broad guiding principles of IPEC and HCAHPS, both inspired by the IOM (2001) report, *Crossing the Quality Chasm*.

IPEC Guiding Principles*	HCAHPS Guiding Principles**
Safe and high quality care	Coordination and integration of care, information, communication and education, transition and continuity
Accessible care	Access to care
Patient-centered care	Respect for patients' values, preferences and expressed needs, physical comfort, emotional support, involvement of family and friends

* (Interprofessional Education Collaborative Expert Panel, 2011, p. i and 4)

** (Goldstein, Farquhar, Crofton, Darby, & Garfinkel, 2005, p. 1980; Keller et al., 2005, p. 2058)

Methods

The purpose of our study was to assess the concept validity of the HCAHPS survey instrument as a potential proxy measure of IPC within American hospitals. To accomplish this, we used manifest content analysis (Berg & Lune, 2012; Hsieh & Shannon, 2005) to establish consistency between the texts of the HCAHPS survey and the domains of IPC as defined by the IPEC. Content analysis entails the objective and systematic examination of any document to make inferences about the text (Berg & Lune, 2012). We began the process with coding, categorization, and sorting according to identified themes, which helped uncover patterns and processes (Berg & Lune, 2012).

identification of suitable tools that match the problem of interest in these initial stages of survey adaptation or modification (Rothman et al., 2009).

Data Analysis

Three researchers on our team coded the HCAHPS survey independently using manifest content analysis (Berg & Lune, 2012). A consensus approach based on discussion was then used to select the codes between two team members. In the absence of a consensus by discussion, the third team member provided feedback to break the tie. The HCAHPS survey questions and the IPEC general competency statements were examined for textual congruence. Using the IPEC domains as categories and the general interprofessional competency statements as themes/codes, the

IPEC report served as a “qualitative codebook” with which to code the HCAHPS survey items (Creswell, 2014). Coded items are listed in Appendices A and B. All text is quoted verbatim. Appendices A lists the construct (i.e. IPC), categories (i.e. IPC domains), and themes/codes (i.e. general competency statements) as extracted verbatim from the IPEC expert panel report, while Appendix B lists the questions in the HCAHPS survey that matched these codes. A conceptual map was drafted to show the linkages between the IPEC codes, IPEC domains and the HCAHPS survey questions (Figure 1).

Coding of the HCAHPS survey questions using the IPEC statements as predefined themes also allowed us to map the rank order of the IPC domains that are most well represented by the HCAHPS data. We also determined the proportion of HCAHPS survey questions that reflect the IPCs collectively and by individual domain. In doing so, we excluded certain questions, such as decisional questions (15 and 18) and demographic questions (26-32) from the HCAHPS survey. This led to the exclusion of 9 questions from the analysis, leaving 23 potentially relevant, data rich questions to be included in our final analysis. Finally, we derived the proportion of HCAHPS survey questions that matched multiple IPC domains simultaneously, as items that should, in future psychometric testing, have the greatest correlation with an overall IPC index that incorporates all pertinent questions.

Results

We found that all IPC domains were represented within the HCAHPS survey questions, although some had greater representation than others. The IPEC domain of values and ethics was best represented in the HCAHPS survey. For example, the first values and ethics general competency statement (VE1), which states that the healthcare team should “Place the interest of patients and populations at the center of interprofessional healthcare delivery,” is conceptually captured by the HCAHPS survey question “During this hospital stay, after you pressed the call button, how often did you get help as soon as you wanted it.” On the other hand, the fifth general competency statement (VE5), which discusses the value of cooperation among all stakeholders in healthcare, is qualitatively linked to eight different HCAHPS survey questions. Figure 1 demonstrates these linkages.

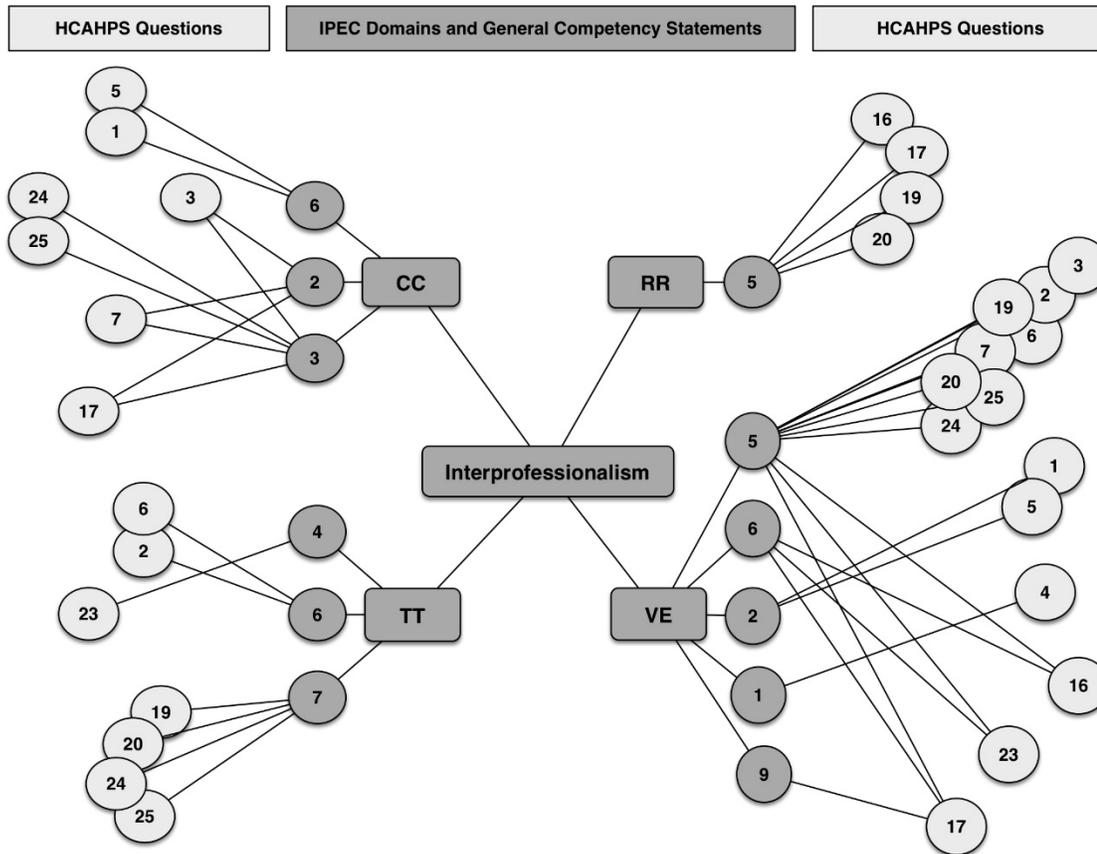
The second general competency statement for the

domain of interprofessional communication (CC2) states that providers should “Organize and communicate information with patients, families, and healthcare team members in a form that is understandable, avoiding discipline-specific terminology when possible.” We found that this idea is directly embedded in HCAHPS questions 3 and 7, which state: “During this hospital stay, how often did [nurses and doctors] explain things in a way you could understand?” These examples demonstrate how interprofessional competency domains are captured by the HCAHPS survey. Figure 1 shows the complete results of our content analysis using a concept map, illustrating all the linkages between HCAHPS questions and IPEC general interprofessional competency statements.

Table 2 shows a rank order listing of the interprofessional competency domains, beginning with those that are best represented. The domain of values and ethics for interprofessional practice is the best captured in the HCAHPS survey questions, followed by interprofessional communication, teams and teamwork, and roles/responsibilities. Table 3 contains the proportions of HCAHPS survey questions that match the IPEC competency statements. 61% of all HCAHPS questions matched at least 1 of the competency statements, and 57% matched 2 or more competency statements.

Discussion

This study demonstrates that many of the HCAHPS questions qualitatively capture IPEC domains, suggesting that they could serve as a good proxy measure of organizational IPC at American hospitals. This is not surprising, given that the guiding principles of the HCAHPS survey closely resemble those of the IPEC report. Our finding that the best represented IPEC domain is values and ethics for interprofessional practice is also unsurprising, given that the HCAHPS survey is designed to capture patient perceptions of providers, which as a survey of satisfaction with care, is inherently value-laden (Zusman, 2012). Nevertheless, the fact that more than half of all HCAHPS questions reflect at least 2 general competency statements represents good evidence that this survey has the potential to capture data pertinent to IPC. It also suggests that the subset of HCAHPS survey questions identified here, if validated quantitatively via psychometric testing, could be used as a proxy measure of IPC for the majority of American hospitals, thus providing one method for quantifying interprofessionalism in that setting in a cost and resource effective manner.



Legend: CC – Interprofessional Communication domain, RR – Roles and Responsibilities domain, TT – Teams and Teamwork, VE – Values and Ethics.

Figure 1. Complete conceptual map, demonstrating the links between the IPEC domains and general competency statements (center of map), and the HCAHPS questions (distal limbs of map). Ex. From the center of the map, we can see that CC-6 (i.e. inter-professional communication general competency statement 6) matched the HCAHPS survey items 1 and 5.

Table 2. Rank order list of IPEC interprofessional competency domains by frequency of representation in the HCAHPS survey questions.

Interprofessional Competency Domain	Rank	Number of Occurrences
Values/Ethics for Interprofessional Practice	1	14
Interprofessional Communication	2a	7
Teams and Teamwork	2b	7
Roles/Responsibilities	4	4

Table 3. Proportions of HCAHPS questions that match the IPEC general competency statements.

Interprofessional Competency	Proportion of HCAHPS Questions
Values/Ethics for Interprofessional Practice	61%
Interprofessional Communication	30%
Teams and Teamwork	30%
Roles/Responsibilities	17%
Overlap with Multiple IPEC Domains	57%
Overall Match with IPEC Domains	61%

Measuring IPC at the organizational level is critical for a number of reasons. First, healthcare takes place at multiple levels (i.e. individual, organizational, and community). Therefore, to successfully link inter-professional interventions targeting each of those levels to patient and population health outcomes, it is necessary to measure IPC at the same level of analysis (Tataw, 2011). Second, in the US, hospitals are arguably the most important organizations currently involved in the delivery of acute care, where the use of a high quality, well-coordinated, effective, efficient, and continuous team-based approach is increasingly paramount. Thus, measuring IPC at the organizational level may be critical to benchmarking the performance of hospitals as healthcare institutions. Finally, the fact that acute care tends to be provided to each patient by a team of rotating healthcare professionals signifies that the same team members may not always be in charge of the same patient. For example, there are handoffs of care from one shift to the next, and this suggests that team-based IPC may vary as the composition of teams vary, even for the same patient. Thus, to overcome these challenges, it is critical to measure the aggregate IPC of an organization. Since the HCAHPS tool is already in use in hospitals nationwide, it may be particularly pertinent to measuring organizational IPC.

Several limitations should be noted. First, given that interprofessional care heavily capitalizes on the work of teams, the fact that many of the HCAHPS questions refer specifically to nurses and doctors and how they interact with patients, and not how they interact with each other and with other healthcare professionals, may limit the ability of the HCAHPS survey to measure IPC. However, note that only 6 out of the 14 identified questions (43 %) refer solely to either doctors or nurses: an equal number of questions (6/14 or 43%) refers to the hospital staff more broadly, suggesting that as a proxy, the HCAHPS tool does have the potential to capture the actions (and thereby the competencies) of other healthcare professionals, or rather, of the healthcare team as a whole. In addition, as nurses and doctors represent the two largest healthcare professions and are the most proximally responsible for direct patient care (which, it is thought, drives much of the patient's perceptions of the team), particularly in the acute care setting, this mix of questions focusing on doctors and nurses as compared to the team as a whole may be appropriate, albeit coincidentally and, we would argue, propitiously.

Nevertheless, it is important to acknowledge that the HCAHPS survey truly does not capture the concept of team members interacting and collaborating with each other, and the absence of this concept can be seen in the fact that none of the IPEC domains we identified through qualitative content analysis reflect this theme. However, as the HCAHPS instrument was not designed specifically for this purpose, the lack of representation of this specific theme can be seen as a delimitation of the tool, not a limitation. Moreover, this is a common challenge of adapting an existing instrument to measure a new construct: the adapted instrument will often not capture every aspect of the new construct (Rothman, 2009). If the HCAHPS survey questions identified here can be shown to have psychometric validity in a subsequent study, then this delimitation will become one of the limitations of the new index of organizational interprofessional competency: future studies that use the new index will need to state that it is not able to capture the theme of team interaction and collaboration. Still, as no other indices of organizational IPC currently exist, the HCAHPS instrument may prove to be a very useful measure to which newer indices designed specifically at the outset to measure organizational IPC can be compared, particularly with regards to establishing their criterion-related validity.

Finally, although this study establishes qualitative content validity (or concept validity), quantitative content validity remains to be investigated via psychometric testing in future studies. It would also be beneficial to examine the IPC of healthcare teams in smaller units, such as those within clinics and hospital wards, as these represent smaller functional structures in which professionals from different healthcare disciplines work together. Some of this research should be qualitative, to capture the nuances of teamwork, while other quantitative measures such as patient clinical care outcomes data could be linked to interprofessional evaluation data at this level. Unfortunately, at this time, there are no validated tools to measure IPC at the organizational level of analysis. Thus, we recommend that the HCAHPS survey questions identified in this study be examined further in additional studies as a potential proxy measure of organizational IPC.

Conclusion

There are many potential implications to our study finding that part of the HCAHPS survey has sufficient concept validity to serve as a proxy measure of

organizational IPC. First, it suggests that HCAHPS could provide a new method with which to explore the impact of interprofessional education, practice and organization interventions on patient health outcomes, which has been the central aim of research in this field for many years (Brandt, 2014) and continues to remain so (Institute of Medicine, 2015). In particular, the role that high performing healthcare organizations can play in improving population health outcomes and reducing healthcare costs is increasingly emphasized as a relevant area of research inquiry for the field of interprofessional care (Lutfiyya, Brandt, Delaney, Pechacek, & Cerra, 2016).

Second, given that multi-year data is available, HCAHPS could well serve as a secondary analytic tool for tracking the effectiveness of interprofessional programs being implemented within hospitals nationwide. Hospitals could compare the change in their organizational IPC scores over time to detect whether such interventions are having an effect on their healthcare professionals' aggregate level of IPC. Policymakers and administrators could use this tool to evaluate the impact of their institutions' commitment to interprofessional initiatives on patient health outcomes within their respective hospitals and health systems.

In addition, this measure could allow these assessments to be made almost immediately, at a time when there are no other quantitative tools available to measure IPC at the hospital level. Existing measures of IPC are limited in their usefulness to healthcare policy and clinical practice in that, unlike the HCAHPS survey, they are neither linkable to patient health outcomes datasets that already exist, nor do they offer the opportunity to evaluate IPC on a national scale with a very large sample size. Thus, we believe that the HCAHPS survey questions identified in this study represent a valuable resource that could allow comparative assessments of organizational IPC in this manner.

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Appendix A. *IPEC report general competency statements that reflect one or more HCAHPS survey questions, and the core coded concepts that they represent.*

#	General Competency Statement
<i>IPEC Domains</i>	
<i>Values and Ethics for Interprofessional Practice (VE)</i>	
VE1	Place the interests of patients and populations at the center of interprofessional healthcare delivery.
VE2	Respect the dignity and privacy of patients while maintaining confidentiality in the delivery of team-based care.
VE5	Work in cooperation with those who receive care, those who provide care, and others who contribute to or support the delivery of prevention and health services.
VE6	Develop a trusting relationship with patients, families, and other team members.
VE9	Act with honesty and integrity in relationships with patients, families, and other team members.
<i>Roles and Responsibilities (RR)</i>	
RR5	Use the full scope of knowledge, skills, and abilities of available health professionals and healthcare workers to provide care that is safe, timely, efficient, effective, and equitable.
<i>Interprofessional Communication (CC)</i>	
CC2	Organize and communicate information with patients, families, and healthcare team members in a form that is understandable, avoiding discipline-specific terminology when possible.
CC3	Express one's knowledge and opinions to team members involved in patient care with confidence, clarity, and respect, working to ensure common understanding of information and treatment and care decisions.
CC6	Use respectful language appropriate for a given difficult situation, crucial conversation, or interprofessional conflict.
<i>Teams and Teamwork (TT)</i>	
TT4	Integrate the knowledge and experience of other professions – appropriate to the specific care situation – to inform care decisions, while respecting patient and community values and priorities/preferences for care.
TT6	Engage self and others to constructively manage disagreements about values, roles, goals, and actions that arise among healthcare professionals and with patients and families.
TT7	Share accountability with other professions, patients, and communities for outcomes relevant to prevention and health care.

Appendix B. *HCAHPS survey questions that qualitatively match to at least one IPEC general competency statement.*

#	HCAHPS Questions	Matching IPEC Competency Statements
1	During this hospital stay, how often did nurses treat you with courtesy and respect?	CC6, VE2
2	During this hospital stay, how often did nurses listen carefully to you?	TT6, VE5
3	During this hospital stay, how often did nurses explain things in way you could understand?	CC2, CC3, VE5
4	During this hospital stay, after you pressed the call button, how often did you get help as soon as wanted it?	VE1
5	During this hospital stay, how often did doctors treat you with courtesy and respect?	CC6, VE2
6	During this hospital stay, how often did doctors listen carefully to you?	TT6, VE5
7	During this hospital stay, how often did doctors explain things in way you could understand?	CC3, VE5
16	Before giving you any new medicine, how often did the hospital staff tell you what the medicine was for?	RR5, VE6
17	Before giving you any new medicine, how often did hospital staff describe possible side effects in a way you could understand?	CC2, CC3, RR5, VE6, VE9
19	During this hospital stay, did doctors, nurses or other hospital staff talk with you about whether you would have the help you needed when you left the hospital?	TT7, RR5, VE5
20	During this hospital stay, did you get information in writing about what symptoms or health problems to look out for after you left the hospital?	TT7, RR5, VE5
23	During this hospital stay, staff took my preferences and those of my family and caregiver into account in deciding what my health care needs would be when I left.	TT4, VE6
24	When I left the hospital, I had a good understanding of the things I was responsible for in managing my health.	CC3, TT7, VE5
25	When I left the hospital, I clearly understood the purpose for taking each of my medications.	CC3, TT7, VE5

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