International Journal of Hospital-Based Health Technology Assessment
2017, 1:3-11 http://dx.doi.org/10.21965/IJHBHTA.2017.001

Open Access Full Text Article

RESEARCH ARTICLE

Interdisciplinarity in clinical practice in Quebec: Results of a survey with IPC59

[Interdisciplinarité en pratique Clinique au Québec : Résultats d'une enquête avec IPC59]

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Article received:
3 June, 2017

First response:
24 June, 2017

Article accepted:
4 September, 2017

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Abstract: Interdisciplinarity is a key concept for the integration of healthcare system towards a better consideration of patient needs. It is, however, a hard objective for clinical teams since it requires the integration of many concepts. To do so, many efforts are necessary and it is possible that some teams feel working in interdisciplinarity while this is not the case. In such a situation, it would be necessary for these teams to identify their strengths and weaknesses to ensure a continuous improvement towards better interdisciplinary practices. In the context of a hospital-based health technology assessment (HB-HTA) unit, there is a need to use validated tools to assess the degree of integration of interdisciplinary practices. In some cases, such tools do not exist, and the HB-HTA unit must develop these ones. In this study, we present our experience in developing a validated tool to measure the degree of integration of concepts leading to interdisciplinarity, the IPC59, and the Quebec portrait of interdisciplinarity that resulted from it. For this study, healthcare professionals and managers from short-term care settings were recruited from across the province of Quebec; of those, 392 provided valid responses. Results indicate that higher scores on IPC59 were obtained by smaller institutions. In addition, physicians and managers got better scores than nurses and other healthcare professionals. Overall, the degree of integration of the concepts leading to interdisciplinarity appears to be quite high in Quebec's health care system with a median score of 2.25 compared to a maximum score of 3 (i.e., a score between 2 and 2.5 indicating a good integration).

Keywords: interdisciplinarity, clinical practice, healthcare, IPC59, Quebec.

Résumé : L'interdisciplinarité est un concept clé de l'intégration du système de santé vers une meilleure prise en considération des besoins des patients. Sa mise en application est difficile car elle nécessite l'intégration de nombreux concepts. De nombreux efforts sont ainsi nécessaires et il est possible que certaines équipes pensent travailler en interdisciplinarité alors que ce n'est pas le cas. Dans une telle situation, il est nécessaire d'identifier les forces et faiblesses de ces équipes afin de permettre leur amélioration continue vers de meilleures pratiques en interdisciplinarité. Dans le contexte d'une unité d'évaluation des technologies de la santé (ETS) en milieu hospitalier, il est nécessaire d'utiliser des outils validés pour évaluer le degré d'intégration des pratiques interdisciplinaires. Dans certains cas, de tels outils n'existent pas et l'unité d'ETS doit les développer. Dans cette étude, nous présentons notre expérience de développement d'un outil valide de mesure de l'intégration des concepts menant à l'interdisciplinarité, l'IPC59, ainsi que le portrait de l'interdisciplinarité au Québec. Pour cette étude, des professionnels de la santé et des gestionnaires de centres de soins de court séjour ont été recrutés. Un total de 392 réponses valides a été obtenu. Les résultats indiquent des scores d'IPC59 plus élevés dans les institutions de petites tailles. De meilleurs scores ont également été obtenus pour les médecins et les gestionnaires comparativement aux infirmières et aux autres professionnels de la santé. Au final, le degré d'intégration des concepts menant à l'interdisciplinarité est assez élevé dans le réseau québécois de la santé, avec un score médian de 2,25 sur un maximum de 3 (i.e., une bonne intégration est comprise entre 2 et 2,5).

Mots clés : interdisciplinarité, pratique clinique, soins de santé, IPC59, Québec.

Introduction

Several reasons drive the implementation of interdisciplinarity in healthcare [1]. Three reasons of equal importance are frequently cited in literature. One of these is to better consider the needs of patients [2]. Another reason is to manage complex cases that cannot be addressed by a single specialist [3,4]. Indeed, considering the multifaceted aspects of the patients' conditions, collaboration between healthcare specialists is inevitable under complex situations [5]. The last reason is to reinforce the integration of the healthcare system and to improve its efficiency [6]. In a world of rising healthcare costs and shrinking budgets, the need for rational allocation of public resources is increasing [7,8], and effective interdisciplinary teams could help to achieve this goal [9,10].

Interdisciplinarity in healthcare refers to an approach wherein professionals from different disciplines work in synergy to provide efficient and quality care to patients [11-13]. Understandably, it is a process in which a capacity for analysis and synthesis is developed from the perspectives of several disciplines. Its objective is to deal with a problem as a whole by identifying the relationships and integrating all the different elements involved [12]. However, its implementation is complex, involves different key concepts, and is time-consuming [14-16]. Since members in an interdisciplinary team may have different perceptions on interdisciplinarity, it is necessary to develop tools to measure it.

In our hospital-based health technology assessment (HB-HTA) unit, in 2010, we assessed the benefits of implementation of three interdisciplinary musculoskeletal clinics [17-19]. In this setting, we assessed whether the clinics were really working on an interdisciplinary basis. After a rapid literature review showing no tools available to measure the degree of interdisciplinarity, it was decided to create one on our own. The methodology used to create this tool is described in detail elsewhere [14,20]. The aim of this tool, IPC59 (French acronym for Interdisciplinarity in Clinical Practice – 59 Items), is to measure the degree of integration of the concepts leading to interdisciplinary teams in clinical practice. By doing so, healthcare professionals can identify their strengths and weaknesses and hence improve the effectiveness of care and treatment. This tool is based on a healthcare integration model developed by Contandriopoulos et al. [21]. Starting from a literature review on the characteristics of interdisciplinarity functioning in healthcare, a first tool with 99 items was created [17]. After two quantitative validations, a final tool with 59 items was released [14,20].

The objective of this study was to draw a portrait of interdisciplinarity in clinical practice in the province of Quebec, Canada. We used the data collected during the second phase of quantitative validation of IPC59 and compared scores on interdisciplinarity among professions, healthcare domains, types of institutions, and method of questionnaire administration (paper or online).

Methods

Description of the IPC59

The language used in the IPC59 questionnaire is French Canadian, and the 59 items are grouped into four dimensions of healthcare integration as described by Contandriopoulos et al. [21]. Normative integration is based on the sharing of common values and interests, while functional integration refers to the importance of institutional and organizational contribution to a good interdisciplinary functioning. Clinical integration corresponds to the set of rules and modes of functioning that govern the daily practice of the team. Finally, care integration is the result of interdisciplinary functioning at the level of the institution, the team and the patients. Each dimension is further divided into sub-dimensions representing specific aspects of integration. These dimensions and sub-dimensions are presented in Table 1. Each item is measured

on a Likert-type scale of four levels, ranging from totally agree (score = 3) to totally disagree (score = 0). A "not applicable" option is also provided for each item. By summing the scores and dividing this sum by the number of items, a mean total score and a mean score for each dimension are calculated. Items for which "not applicable" was chosen were not considered. Mean scores are divided into four interval groups. A score above 2.5 indicates very good integration of concepts leading to interdisciplinarity. A score between 2 and 2.5 indicates good integration, while a score between 1 and 2 shows potential divergences, or an average integration. A score of 1 or less indicates poor integration.

Table 1: Dimensions and sub-dimensions of the IPC59

Dimensions	Normative integration	Functional integration	Clinical integration	Care integration
Sub-dimensions	● Vision (2) ● Interest in interdisciplinarity (5) ● Leadership (3)	● Administrative support (4) ● Resources available (4)	● Explicit formalization of roles (3) ● Meeting management and working rules (10) ● Internal functioning and conflict resolution mode (10)	● Results related to the structure (5) ● Results related to the team (6) ● Results related to patients (7)

Numbers in parentheses signify the number of items in each sub-dimension.

Data collection

In our survey, participants were over 18 years and working in an interdisciplinary team in a healthcare institution in Quebec. Managers and presidents of local multidisciplinary councils in healthcare institutions were approached and requested to distribute the questionnaires to healthcare professionals working in interdisciplinarity. This was a convenience sample, and two modes of administration were considered, paper or online (i.e., a web link to SurveyMonkey). The survey consisted of the IPC65 from which were derived the scores for the IPC59. To do so, only the 59 items related to the IPC59 were considered in our analysis since the IPC59 is now the recommended tool to measure the integration of concepts leading to interdisciplinarity [20]. In addition, name of the institution, healthcare domain, number of professionals in the team, profession of the respondent, and number of years of experience in interdisciplinarity were collected. The survey was completed anonymously, and the Ethical Review Board of the CHUS approved the study.

Statistical analysis

Descriptive statistics are provided for the total score and scores for each dimension. Since the scores were not normally distributed, the median and interquartile ranges (IQR, 25th–75th percentiles) are presented. The Kruskal-Wallis and Mann-Whitney U tests are used to compare the scores among professions, healthcare domains, and institution types. All analyses were performed using SPSS software (version 23; IBM, New York, USA). A p-value <0.05 was considered significant.

Results

Participants

The study was conducted between January 2013 and June 2014. Across 12 cities in Quebec, 398 participants responded to the survey. Five questionnaires had less than 50% of the questions answered, and one

respondent answered “not applicable” to all questions. These six questionnaires were removed from the analyses. Of the remaining 392 questionnaires, 342 (87.2%) were 100% complete without missing data. About half of the questionnaires were completed online (Table 2), and the median time to complete each questionnaire was 12 minutes. Professionals from 57 different teams with a median of four respondents per team responded to the survey. The respondents came from 16 healthcare institutions, with the majority of participants working in health and social service centers (32.7%) and rehabilitation centers (31.6%). Healthcare professionals constituted 67.2% of the respondents; nurses were 23.7%; and physicians or managers were 9.2%. The healthcare professionals’ group was composed of 21 different categories, the most numerous being occupational therapist (18%), social workers (18%), and physiotherapist (14.8%).

Scores and comparisons

The results suggest that 69% of respondents had good integration or better (score ≥ 2) with a median (IQR) value of 2.25 (1.92–2.55) (Table 3). The best results were for normative integration and care integration with 79.3% and 76.5% of good integration, respectively. In general, functional integration and clinical integration had approximately 60% of good integration, but when the items were analyzed, more than 35% revealed scores <2, indicating that several situations should have been examined in groups and potentially corrected. Particularly, for the dimension of functional integration, more than 30% of the respondents disagreed or totally disagreed to three items about available resources (i.e. training, coaching in interdisciplinarity, and staff retention). For clinical integration, in the internal functioning sub-dimension, 56% indicated that some members’ behavior may have undermined interdisciplinary collaboration, and 41% indicated that physicians did not consider all members of the team as collaborators. In addition, 32% disagreed about the existence of meetings on the process of interdisciplinarity, and 34% disagreed with the existence of continuous improvement mechanisms.

There were clearly significant differences according to profession ($p<0.001$). Physicians had lower functional integration (1.75 (1.38–2.14)). Nurses had lower clinical integration (1.95 (1.70–2.21)) and care integration (2.00 (1.85–2.43)). Managers had higher scores for all components of integration.

There were no differences according to mental or physical healthcare domain, but there were significant differences according to institution. Smaller institutions such as rehabilitation centers and local community service centers had higher scores relating to integration, whereas university hospital centers and health and social service centers had generally lower integration scores, with a median value slightly below 2.

Discussion

This survey provides a portrait of interdisciplinarity in Quebec with the participation of individuals from different regions and healthcare institutions. The analysis of IPC59 can serve as a basis to explore the reasons for the strengths, weaknesses and, in some cases, the divergences within the teams. In addition, the IPC59 can potentially establish a training plan to improve the effectiveness of interdisciplinarity in healthcare teams. In practice, if a team wants to assess its degree of integration of key elements leading to interdisciplinarity, it can calculate its scores by dimension or sub-dimension, and scores <2 can be interpreted as situations that should be examined and potentially corrected. In addition, the team can analyze each of its items separately to determine whether some are more problematic than others.

The results suggest that the integration of interdisciplinarity in Quebec teams is good with 69% of participants obtaining good or very good scores (i.e., a score between 2 and 2.5 or above 2.5). Upon

analyzing items separately, the results indicate good normative integration with a clear vision of team goals and a common interest in interdisciplinary work. For care integration, respondents indicate having good coordination of clinical practices related to their team structure and operation. However, the results indicate several situations that should be carefully considered by the teams and potentially corrected. In the clinical integration dimension, the results reflect problems in internal functioning, particularly when physicians do not consider all members of

Table 2: Characteristics of participants (n = 392)

	Number of observations	Values
Number of valid surveys, n (%)	392	392/398 (98.5)
Survey, n (%)	392	
Paper		202 (51.5)
Online		190 (48.5)
Completion time on the web (minutes), median (IQR)	190	12 (9.2–17.2)
Number of participants per team (n = 57), median (range)	57	4 (1–35)
Cities, n (%)	392	
Sherbrooke		108 (27.6)
Montréal		67 (17.1)
Jonquière		57 (14.5)
Roberval		51 (13.0)
Saint-Jérôme		30 (7.7)
Trois-Rivières		28 (7.1)
Saint-Eustache		18 (4.6)
Alma		13 (3.3)
Lévis		10 (2.6)
La Tuque		5 (1.3)
Rimouski		4 (1.0)
Charlevoix		1 (0.3)
Number of healthcare institutions		16
Number of surveys by type of institution, n (%)	392	
University hospital center, n = 1		73 (18.6)
Hospital center, n = 2		54 (13.8)
Health and social services center, n = 8		128 (32.7)
Rehabilitation center, n = 4		124 (31.6)
Local community service center, n = 1		13 (3.3)
Number of professionals by team, median (range)	392	14 (2–100)
Experience (years), median (range)	364	9 (0.5–37)
Areas, n (%)	392	
Mental health		99 (25.3)
Physical health		293 (74.7)
Professions, n (%)	372	
Physicians		14 (3.8)
Nurses		88 (23.7)
Professionals		250 (67.2)
Managers		20 (5.4)

Note: IQR: Interquartile range (25^{th}–75^{th} percentiles).

the team as collaborators or when some team members' individual and professional logic undermines interdisciplinary collaboration. In this regard, power is generally associated with discipline, and not all disciplines have the same power, particularly physicians and managers [15,22-26]. Nonetheless, it is necessary to have a team leader [24], and a good team leader must have humility, good interpersonal skills, and the ability to effectively communicate with team members and take efforts to manage everyone in the team [24,26]. However, this difficulty to collaborate seems to be mitigated in the clinical integration by the fact that the role of each member of the team are clear, meetings held and help coordinate the actions of various members. This is important since several reports suggest that team meetings are critical for a better functioning of interdisciplinarity to facilitate communication and remove professional barriers [27-29].

By cons, the results indicate that not all teams have a mechanism to continuously improve their functioning, and some respondents indicate having no meetings related to the functioning of interdisciplinarity. Considering the fact that few team members receive training on team work in college or university and the fact that these gaps are rarely compensated for by the training programs offered by organizations, a training program in this area could reinforce the importance of interdisciplinary work in the healthcare system, empowering teams and providing them with a common language [16]. This is echoed in the functional integration dimension, in which respondents indicate receiving little recognition and having no access to training to improve their individual skills or coaching in interdisciplinarity. However, other items in this dimension suggest that teams have administrative support and most of the resources necessary for good clinical functioning.

Results of the survey using the IPC59 also suggest that physicians and managers score higher their integration of the concepts leading to interdisciplinary than nurses or other healthcare professionals. In particular, physicians and managers score higher in the dimensions of clinical integration and care integration. This may be explained by the fact these two categories have more power and may have more influence on the functioning of the team, as well as a philosophy more focused on achieving results, especially for managers. As regard to the higher scores obtained in smaller institutions (i.e., local community service center and rehabilitation center), this may be explained by the cohesive nature of these institutions where changes are easier to make and where there is less turn over in the teams.

Some limitations are found in this study. First, this study consisted of a convenience sample, and the interest to participate may have differed among healthcare professionals working in interdisciplinary teams for a variety of reasons. For example, the respondents may have decided to participate in the study to know more about interdisciplinarity or to validate their practice; thus, our sample may not fully represent the spectrum of interdisciplinary teams in Quebec. It is, however, impossible to compare the characteristics of individuals who did not respond with those who responded. In addition, questionnaires were administered to teams at the discretion of the managers. Since some of these managers may have used this questionnaire to demonstrate the importance of interdisciplinarity, this may have caused selection bias and may explain the high scores observed. Nonetheless, the large number of subjects and the fact that the data came from several regions of Quebec and different types of institutions, as well as discussions with managers in these institutions, suggest that the data were rather representative of the target population. Another limitation is the length of the questionnaire. Indeed, 59 items could limit its use. However, the response rate was good, with 92% of participants responding to 90% or more of the questions.

Table 3: Comparisons of scores on integration according to profession, healthcare domain, and type of institution

	IPC59	Normative integration	Functional integration	Clinical integration	Care integration
Total, median (IQR)	2.25 (1.92–2.55)	2.40 (2.00–2.70)	2.00 (1.75–2.50)	2.14 (1.85–2.52)	2.28 (2.00–2.67)
Good integration (score ≥ 2)	271 (69.1)	311 (79.3)	238 (60.7)	249 (63.6)	300 (76.5)
Score <1	4 (1.0)	5 (1.3)	14 (3.6)	4 (1.0)	2 (0.5)
Score 1–2	117 (29.8)	76 (19.4)	140 (35.7)	139 (35.5)	90 (23.0)
Score 2–2.5	156 (39.8)	135 (34.4)	134 (34.2)	148 (37.8)	151 (38.5)
Score 2.5–3	115 (29.3)	176 (44.9)	104 (26.5)	101 (25.8)	149 (38.0)
Professions, median (IQR)					
Physicians (n = 14)	2.46 (1.68–2.56)	2.55 (2.00–2.78)	1.75 (1.38–2.14)	2.46 (1.67–2.55)	2.44 (1.97–2.69)
Nurses (n = 88)	2.02 (1.78–2.37)	2.25 (1.83–2.68)	2.00 (1.63–2.25)	1.95 (1.70–2.21)	2.00 (1.85–2.43)
Professionals (n = 250)	2.26 (1.95–2.55)	2.30 (2.00–2.70)	2.13 (1.75–2.50)	2.20 (1.90–2.52)	2.33 (2.00–2.72)
Managers (n = 20)	2.50 (2.06–2.70)	2.60 (2.20–2.90)	2.13 (2.00–2.59)	2.50 (1.94–2.68)	2.67 (2.19–2.88)
p-value	<0.001	0.158	0.022	<0.001	<0.001
Domain, median (IQR)					
Mental health (n = 99)	2.26 (1.97–2.53)	2.40 (2.00–2.80)	2.13 (1.75–2.38)	2.27 (1.90–2.48)	2.28 (2.00–2.71)
Physical health (n = 293)	2.22 (1.88–2.56)	2.40 (2.00–2.70)	2.00 (1.75–2.50)	2.11 (1.83–2.52)	2.28 (2.00–2.67)
p-value	0.691	0.632	0.738	0.468	0.842
Type of institution, median (IQR)					
Hospital center (n = 54)	2.28 (1.89–2.52)	2.40 (2.00–2.60)	2.06 (1.75–2.50)	2.13 (1.86–2.48)	2.31 (2.00–2.65)
University hospital center (n = 73)	2.00 (1.71–2.36)	2.30 (1.80–2.70)	1.88 (1.63–2.25)	1.94 (1.59–2.20)	2.06 (1.81–2.44)
Rehabilitation center (n = 124)	2.47 (2.21–2.68)	2.50 (2.20–2.80)	2.25 (2.00–2.59)	2.41 (2.15–2.61)	2.54 (2.22–2.83)
Health and social services center (n =128)	2.05 (1.75–2.40)	2.20 (1.80–2.60)	1.88 (1.38–2.25)	1.98 (1.71–2.39)	2.07 (1.83–2.56)
Local community service center (n = 13)	2.58 (2.25–2.76)	2.90 (2.62–3.00)	2.50 (2.13–2.63)	2.55 (2.20–2.72)	2.50 (2.17–2.75)
p-value	<0.001	<0.001	<0.001	<0.001	<0.001
Survey, median (IQR)					
Paper (n = 202)	2.22 (1.86–2.51)	2.40 (2.00–2.7)	2.00 (1.63–2.39)	2.11 (1.83–2.48)	2.24 (1.94–2.65)
Online (n = 190)	2.30 (1.93–2.57)	2.40 (2.00–2.8)	2.13 (1.75–2.50)	2.18 (1.87–2.52)	2.33 (2.00–2.72)
p-value	0.178	0.358	0.040	0.321	0.239

Note: IQR: Interquartile range (25th–75th percentiles).

In addition, the median time to respond was 12 minutes, which was quite reasonable. Finally, social desirability bias could have occurred when employees who received paper questionnaires from their managers felt obliged to respond. However, when dimension scores were compared between the two survey modes, there were no significant differences between paper and online forms except for functional integration where the score on the paper form was lower (p=0.40). These results suggest a low risk of bias with regard to desirability bias and the survey mode used.

In the context of an HB-HTA unit, this study was made possible by the initial request of two healthcare agencies in Quebec that needed to assess the effectiveness of three interdisciplinary musculoskeletal clinics [17-19]. This was also the logical continuation of a previous study conducted with one of these clinics [30] and where we had not been able to evaluate its degree of interdisciplinarity due to lack of a valid instrument. In this context, we developed our own instrument, which was validated a first time with 99 items, leading to a new instrument with 65 items [14]. Since many changes were provided to the initial questionnaire with 99 items, it was considered that a second validation was necessary. This one was conducted after we presented the initial version of the IPC65 at the provincial congress of the association of multidisciplinary councils of Quebec in 2012 and where we enrolled many presidents of local multidisciplinary councils. This greatly helped us to conduct the second validation with 65 items, resulting in a final questionnaire with only 59 items [20]. These two waves of validation were made possible because it corresponded to a need from many teams to have their degree of interdisciplinarity assessed (including the three initial musculoskeletal clinics) and because the activities of the HB-HTA unit are deeply rooted in the local healthcare network which allows its members to fill the needs of their local stakeholders. This requires careful listening to stakeholders and a lot of flexibility, especially to learn new techniques (e.g. questionnaire validation) and to seize opportunities (e.g. provincial congress). However, this experience, along with others we had [31], showed that it was possible.

Conclusion

The development of a new tool to assess the degree of integration of concepts leading to interdisciplinarity in clinical care helped our HB-HTA unit to better fulfil the needs of our local stakeholders. This tool helped healthcare managers and professionals to identify the strengths and weaknesses of their interdisciplinary teams. By doing so, they are able to develop new strategies to reinforce their collaboration for the benefit of patients. As regards the results of our survey using IPC59, the degree of integration of these concepts appears to be quite high in Quebec, with a median score of 2.25 (i.e., the maximum is 3), but strong differences can be found regarding the type of profession or institution.

Acknowledgements

We acknowledge all collaborators and participants to this study, especially the members of the ACMQ (Association des conseils multidisciplinaires du Québec) for their continuous support. Thomas G. Poder is member of the FRQS-funded Centre de recherche du CHUS (CRCHUS).

Funding

None.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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