Acta Biomed 2021; Vol. 92, Supplement 2: e2021033 DOI: 10.23750/abm.v92iS2.11954

Interprofessional collaboration between different health care professions in Emilia Romagna

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Abstract. *Background and aim of the work*: Interprofessional collaboration in the healthcare sector contributes to the delivery of high quality and safe services to patients across different subdivisions of the healthcare system which is faced with constant challenges. The international literature offers a plethora of tools for assessing the collaboration between health workers, but only a few of these have been validated in the Italian language. One that has undergone such validation is the interprofessional collaboration (IPC) scale, which measures the perception of collaboration among health professionals. An advantage of this scale is that is addresses all workers within the system, and is not limited to specific professions. The aim of the present study was to apply the validated Italian version of the IPC scale, to a context different to the one used for its validation, to measure the level of collaboration between different health care workers. *Method*: A questionnaire-based study was conducted on a sample consisting of 329 health professionals working at Azienda USL-IRCCS in Reggio Emilia. The categorical and continuous variables were analysed using descriptive statistics (frequencies, percentages and standard deviations). *Results*: The IPC scale showed physicians to express the highest level of collaboration with other professionals, in line with the results of other studies in the literature. The values calculated for the factors "accommodation" and "communication" were higher than for "isolation", depicting a good level collaboration. The only case in which the isolation factor, which describes an absence of collaboration, was equal to the other two factors was in relation to the evaluation of midwives by nursing aides/orderlies. *Conclusions*: In conclusion, the Italian version of the IPC scale provides a useful instrument for measuring interprofessional collaboration between workers in the healthcare sector. In the present study, it revealed a satisfactory level of collaboration between health professionals in an organization located in Emilia Romagna, Italy. (www.actabiomedica.it)

Key words: interprofessional collaboration, interprofessional competence, health professionals, Interprofessional collaboration (IPC) scale, Italian validation IPC scale

Introduction

The need to respond to emergency situations, financial constraints, technological innovations, demographic changes and the increasing demands placed on health services by chronic disease states in the population are some of the key factors placing pressure on healthcare systems to undergo continual reorganization. In this challenging context, interprofessional collaboration (IPC) – or "working in a team", which is used interchangeably with the concept of interprofessional collaboration, and refers to "when individuals

from different health professions communicate and make decisions about a patient's healthcare based on shared knowledge and skills" (1) – is important for ensuring effective care and the delivery of high quality and safe services to patients across different healthcare subdivisions, and for maximizing human recourses within the healthcare sector (2-7).

Recommendations received from both the international level (8) and national institutions (9) indicating the need to improve IPC have led to the implementation of different strategies where interprofessional education is combined with IPC in order to prepare health care professionals to work together successfully and guarantee care being delivered in an efficient manner (2).

Research into IPC, which has undergone significant expansion over recent years, has involved various health professions, such as, for example, physiotherapists, occupational therapists and psychologists (5,10,11); thus, expanding upon the initial studies into IPC that mainly focussed on the collaboration between physicians and nurses (12-18). Research into the team working has also been developed through the use of different methods as well as diverse perspectives, focussing on many different dimensions of collaboration (19) and investigating a variety of contexts, such as primary care, community care and acute care (20, 21).

Regarding the Italian context, little ICP research has been performed to date. Of the few studies published on this issue, attention has been limited to nurse-physician collaborations (12, 22), nurses and different types of physicians (23), and a multidisciplinary collaborations between health and social care professionals (24). Only recently have researchers also focussed on the IPC between the different health professions (11,21,25), but work in this field is still limited.

The limited number of studies on team working in the Italian context is also due to the fact that methodological instruments that allow interprofessional collaboration to be measured in the Italian language are lacking, and the process of validating translated tools requires both time and resources. At the international level, many different tools exist that measure IPC, but only a few of them are also available in the Italian language. Some of the scales validated in the Italian language are: the Nurse-Physician Collaboration Scale – NPCS (12); the Interprofessional Collaboration Scale – IPC (11); the Team Climate Inventory – TCI (26); the Ottawa Crisis Resource Management Global Rating Scale – GRS (27); and the Chiba Interprofessional Competency Scale – CICS29 (25). Each of these scales focusses on different aspects of collaboration. The specific advantage of the IPC scale is that it allows collaboration between different health professions to be measured.

Aim

The aim of the study was to apply the validated Italian version of the IPC scale (11,21,28) – in a context different to the one applied for its validation – to measure the level of collaboration between different health care workers. In order to achieve this objective, a quantitative research design was planned.

Method

Setting

The data were collected between September and December 2019 as part of the Master's research course held at the University of Parma (Master's degree in "Case/Care Management in Ospedale e sul Territorio per le Professioni Sanitarie" I level). The context of the research is the Local Health Unit-IRCCS in Reggio Emilia, Northern Italy. The total number of the workers in the Local Health Unit-IRCCS (on 31st August 2018) was 5548 workers: 4774 were health care workers and 774 held administrative roles.

The data collected referred to health professionals working for the Local Health Unit-IRCCS for one or more years.

Instrument

The survey tool was a structured questionnaire created ad-hoc in the Italian language that included the validated Italian version of the IPC scale (11,28). The IPC scale (11,21,28) is composed of 13 items. It was first validated in the Italian language in a healthcare context in Northern Italy, and it was reviewed

and adapted to different Italian health professions at the same time. The process of adapting and enhancing tools in the Italian language in the sphere of healthcare, before the final version is ready for use, involves four steps according to the instructions set out by the WHO (29): forward translation; expert panel back-translation; pre-testing and cognitive interviewing. This process has been described in depth by Vittadello et al. (11).

The 13 statements of the original IPC scale are the following:

1. <We> have a good understanding with <them> about our respective responsibilities.
2. <They> are usually willing to take into account the convenience of <us> when planning their work.
3. I feel that patient treatment and care are not adequately discussed between <us> and <them>.
4. <We> and <they> share similar ideas about how to treat patients.
5. <They> are willing to discuss <our> issues.
6. <They> cooperate with the way we organize <our> care.
7. <They> would be willing to cooperate with new <our> practices.
8. The <they> do not usually ask for <our> opinions.
9. <They> anticipate when <we> will need their help.
10. Important information is always passed on between <us> and <them>.
11. Disagreements with <them> often remain unresolved.
12. <They> think their work is more important than the work of <us>.
13. <They> would not be willing to discuss their new practices with <us>.

Terms in angle brackets (< >) are replaced by professional group labels (28).

The response options for each item are: strongly disagree (1), disagree (2), agree (3), and strongly agree (4).

As was identified by Kenaszchuk et al. (28), and confirmed through factor analysis and confirmatory factor analysis by Vittadello et al. (11), the above-listed items principally load on three key factors and correlate weakly with other factors. The three key factors have been defined as: "communication", "accommodation" and "isolation" (28). The communication factor is composed of items: 1, 3, 9, 10 and 11; the accommodation factor is composed of items: 2, 4, 5, 6 and 7; and the isolation factor is composed of items 8, 12 and 13.

Additional questions were included regarding the frequency of collaborations between different health professionals and socio-demographic questions. The use of the Italian version of the IPC scale was officially requested and authorized by the Claudiana College of Healthcare Professions Bolzano/Bozen, Italy.

The health workers considered were: physicians, nurses, dieticians, speech therapists, physiotherapists, psychologists, midwives, nursing aides/orderlies, occupational therapists and psychiatric technicians.

The questionnaire was administered by the LimeSurvey platform owned by the University of Parma. The online questionnaire took approximately 15 minutes to complete. It opened with a filter question that selected participants based on the numbers of years they had worked in that area. Respondents who had not worked in their present position for at least one full year were sent automatically to the end of the questionnaire. The questionnaire was completely anonymous.

Data analysis

All data were downloaded from the LimeSurvey platform software, and a database of the completed survey answers was constructed and prepared using R software (Version 1.2.5019). The data were analysed in an aggerate way using R software.

The database was constructed using non-probabilistic sampling and non-proportional stratified sampling of the questionnaire responses provided by professionals who had worked for at least one year in the Local Health Unit-IRCCS.

The categorical and continuous variables were analysed using descriptive statistics (frequencies, percentages and standard deviations). The variables were also aggregated (by calculating the mean values of the 13 items score) (21) in order to calculate the total IPC.

Ethical consideration

The study proposal was submitted to the Reggio Emilia Ethics Committee. Since the instrument for data collection does not permit participants to be identified, and the research does not involve any physical or invasive intervention of the subjects involved, the secretary of the Reggio Emilia Ethics Committee expressed that the research could be conducted.

All the beginning of the survey, all participants received an informative message that explained the purpose of the research and guaranteed the anonymity of all information collected, and they were asked to provide their informed consent before proceeding onto the questionnaire. All data collected are held at the University of Parma.

Results

Response rate

In total, 329 health professionals working in the Local Health Unit-IRCCS of Reggio Emilia for at least one year completed the questionnaire.

The distribution of the type of professionals participating in the survey is presented in table 1. The general response rate was low, with the participation rate of nurses being higher than that for the other professions. The "others" group includes: dieticians (only one dietician participated in the survey), speech-therapists (8 answered), occupational therapists (4 people) and psychiatric technicians (2 people).

The ICP results for the category "others" will not be discussed any further since it is composed of a variety of professions working within healthcare.

Participant characteristics

The total sample comprises 263 females (79.9%) and 66 males (20.1%), and, in contrast with others studies, such as Wieser et al. (21), the female component is well represented in all professions.

Table 2 provides information about the educational background of the respondents, divided according to gender. In particular, it shows that females who had completed their education at the secondary school level (21.7%) were more represented in the sample than males with the same level of schooling (15.2%).

Figure 1 shows the percentage (%) distribution of respondents divided according to profession, gender and age-class.

More than half of the male nurses and half of the male physiotherapists fell into the age group <30 years and 31-40 years old. Female physicians were mostly represented in the age class >61, and female nursing aides/orderlies were mostly aged 41-50 years old. Midwifery is a profession mainly practised by females; indeed, no men are present in the sample, and none of the midwives participating in the survey were older than 60 years. The psychologists in the sample were predominantly female, with just one male psychologist participating in the survey; the female psychologists are all less than 51 years old.

Regarding the work setting, 154 (46.81%) respondents reported to work in the sphere of "ordinary"

TABLE 1. Study sample

Profession	**No.**	**%**
Midwife	18	5.47
Nurse	145	44.07
Nursing aide/orderly	26	7.90
Physician	31	9.42
Physiotherapist	60	18.24
Psychologist	17	5.17
Others	32	9.73
Total	329	100.00

TABLE 2. Percentage distribution of wrespondents divided according to gender and education level.

	Gender			
	Male		**Female**	
Level of education	No.	%	No.	%
Secondary school education	10	15.2	57	21.7
Bachelor's degree	24	36.4	98	37.3
Master's degree	23	34.8	79	30.0
Tertiary education	9	13.6	29	11.0
Total	66	100	263	100

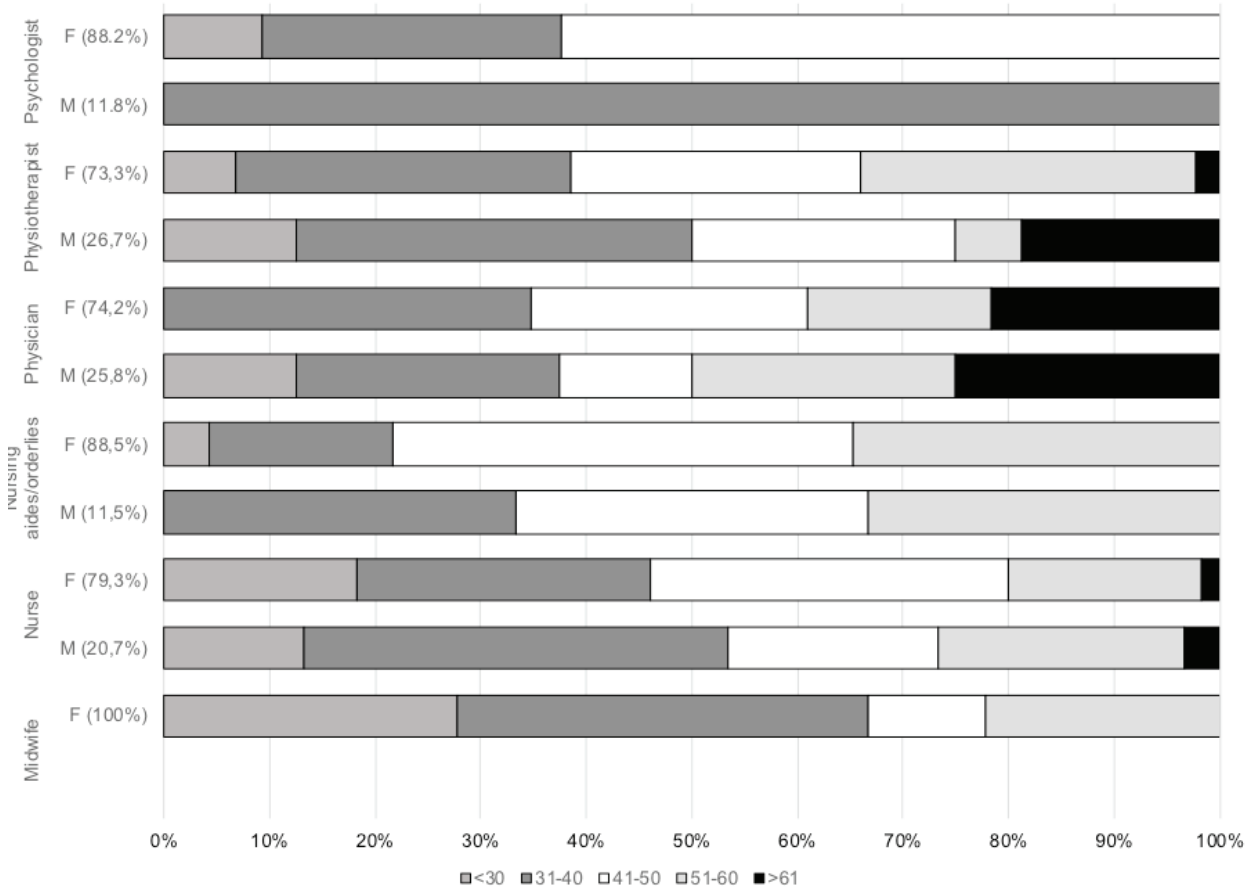


Figure 1. Percentage distribution of respondents divided according to profession and age group

(in-patient) hospitalization, 79 (24.01%) worked in out-patient clinic/day hospital, 49 (14.89%) in home healthcare, 24 (7.29%) in emergency care, 10 (3.04%) in the surgical setting, and 13 (3.95%) in other wards.

A total of 78 respondents (23.70%) reported working in the same place for less than 10 years (23.70%), 98 (29.78%) reported working in the same setting for 11 to 20 years, and 65 (19.75%) reported working in the same organization and in the same role for 21 to 30 years. Thirty-nine (11.84%) respondents reported working in the same place for more than 31 years.

Regarding the respondents' roles in the workplace, 321 (70.21%) had a purely executive role, 67 (20.36%) held coordination and executive positions, and 31 (9,42%) had coordination roles only. A majority of respondents (269 workers, 81.76%) had long-term contracts, while 60 people (18.24%) held temporary contracts.

Collaboration

Table 3 reports the descriptive statistics for answers to the question: "How often do you work with which professional groups?" Respondents were asked to indicate the frequency of collaborations carried out with target professions according to a 4-point Likert scale, which ranged from "every day" to "sometimes during the year".

Each professional group is reported in terms of absolute frequencies and percentages of the total number of professionals who declared to work every day (in the last year) with each of the other professions. For example, 68 nurses (81.9% of the total number of nurses) said they had collaborated every day in the last year with a physician. The data in table 3 also reveal that some professional groups did not collaborate at

TABLE 3. Distribution of respondents according to the frequency of collaborations made with other professionals.

	Collaborations in the last year – total No. of days											
	Midwife		Nurse		Nursing aide/ orderly		Physician		Physiotherapist		Psychologist	
Respondents	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Midwife (18)			16	88.9	17	94.1	18	100			12	66.6
Nurse (145)	5	33.3			55	78.5	68	81.9	19	36.5	6	17.6
Nursing aide/ orderly (26)	2	100	12	100			6	75.0	4	66.7	3	60.0
Physician (31)	3	75.0	20	86.9	15	88.2			10	71.4	2	11.7
Physiotherapist (60)			42	73.6	41	82.0	50	86.2			1	3.8
Psychologist (17)			1	50.0			1	8.3				

all with certain other groups; for example, in this sample, none of the midwives reported to have worked with a physiotherapist, and none of the psychologists reported to have worked with a nursing aide/orderly, midwife or physiotherapist.

The IPC scale

Figure 2 depicts the mean values (± SD) for the IPC variable and the three factors (Com = Communication; Acc = Accommodation; and Iso = Isolation) which were identified in the studies by Kenaszchuk et al. (28) and Vittadello et al. (11).

As illustrated in the graph for nursing aides/orderlies (figure 2), these professionals reported good collaborative experiences with physiotherapists (IPC column value 3.5) and nurses (3.2), but rated their experiences with physicians and psychologists slightly lower (3.1). Collaborations with midwives were poorly rated (2.1).

Perceptions expressed by midwives about collaborations with psychologists and nursing aides/orderlies were both rated as being good (IPC 3.4 and 3.3, respectively). The lowest ratings regarded collaborations with nurses (3.1) and physicians (3).

Nurses reported good collaborations with physiotherapists and psychologists (IPC 3.5 for both), but slightly lower values were revealed in relation to nursing aides/orderlies (3.4), physicians (3.2) and midwives (3.1).

The graph related in physicians' responses reveals good collaborative experiences in relation to all the other professions; IPC values range from 3.3 (relative to midwives) to 3.5 (physiotherapists and psychologists).

The physiotherapists reported their best collaborations to be with physiologists (IPC 3.4), followed by physicians (3.2), whereas collaborations with nurses and nursing aides/orderlies were rated slightly lower (3.1).

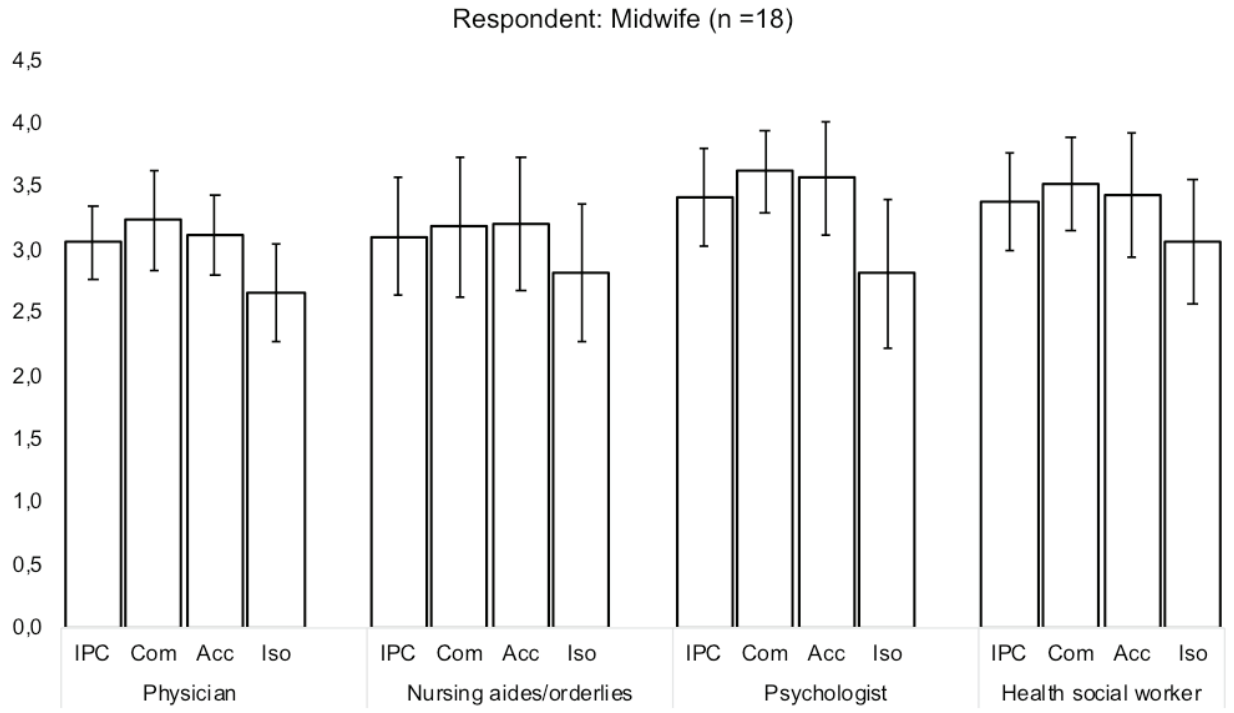
The perceptions expressed by psychologists about collaborations ranged from 3.0 (relative to physiotherapists) to 3.6 (relative to midwives).

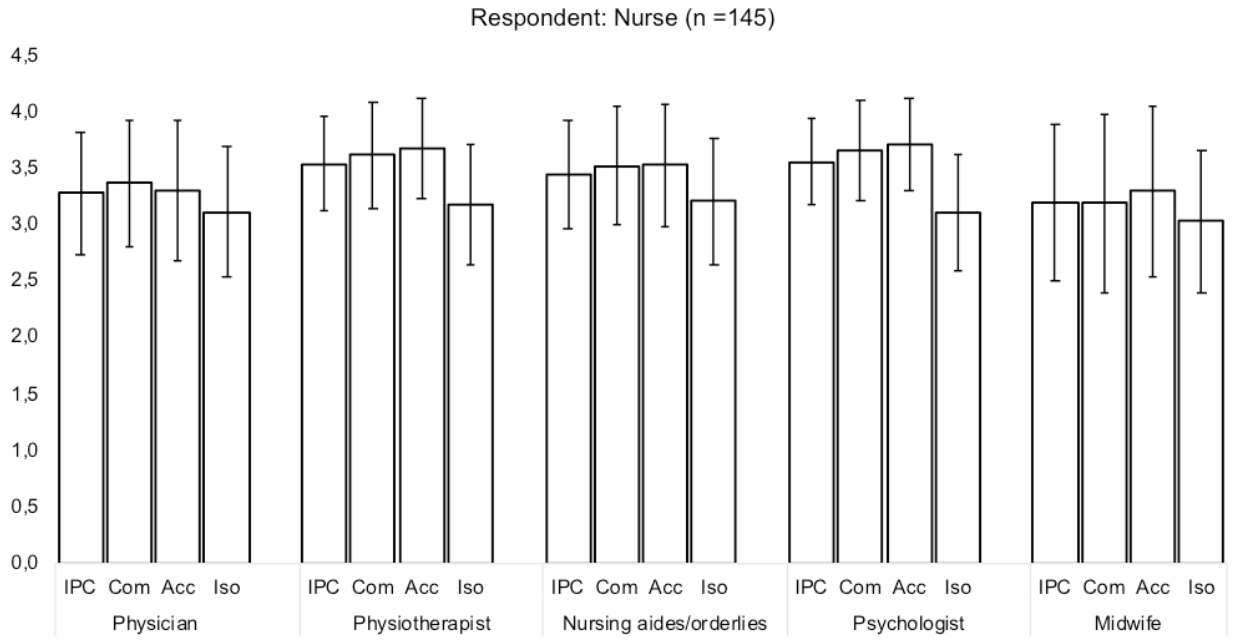
Except for the evaluations made by nursing aides/orderlies relative to midwives – where the level of isolation was equal to the score for communication and accommodation – in all other cases, the communication and accommodation scores were higher than that for isolation, and this indicates a good overall level of interprofessional collaboration.

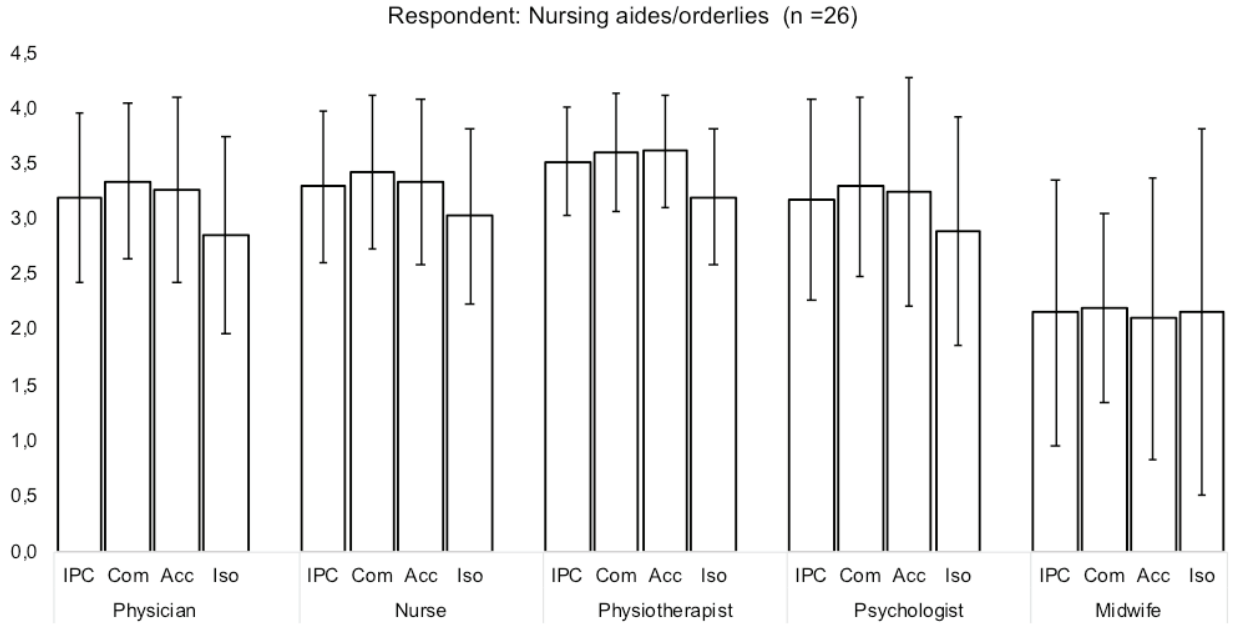
Discussion

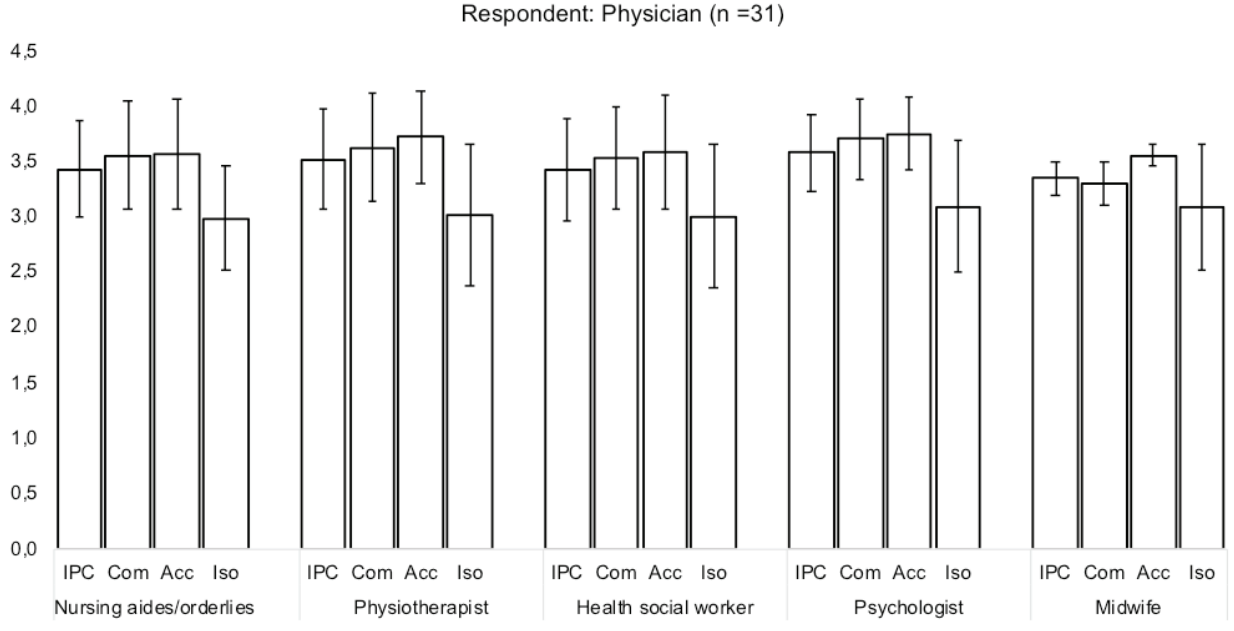
The results from the IPC scale indicate that, although the levels of collaboration measured in this study were not as high as those reported by Wieser et al. (21), the attitudes towards collaborations between different health care professions were generally positive. Physicians expressed the highest levels of collaboration with the other categories of health workers – a result which is, once again, in line with previous

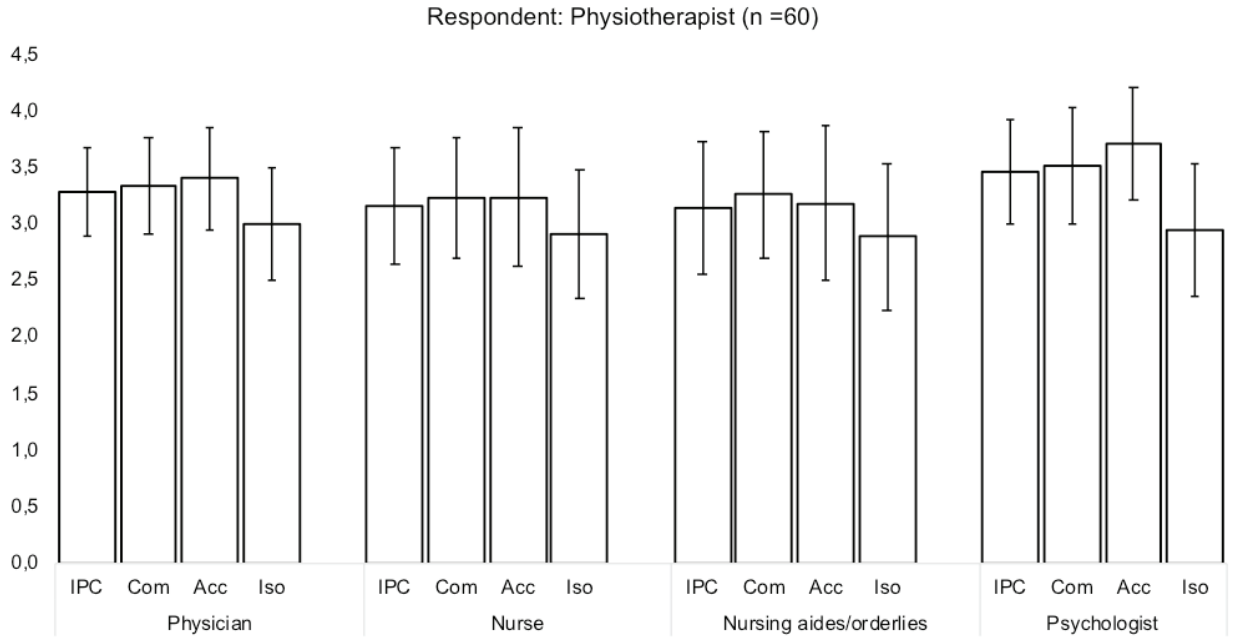
Figure 2. Mean IPC values and scores relative to the factors communication, accommodation and isolation for six types of health professional.

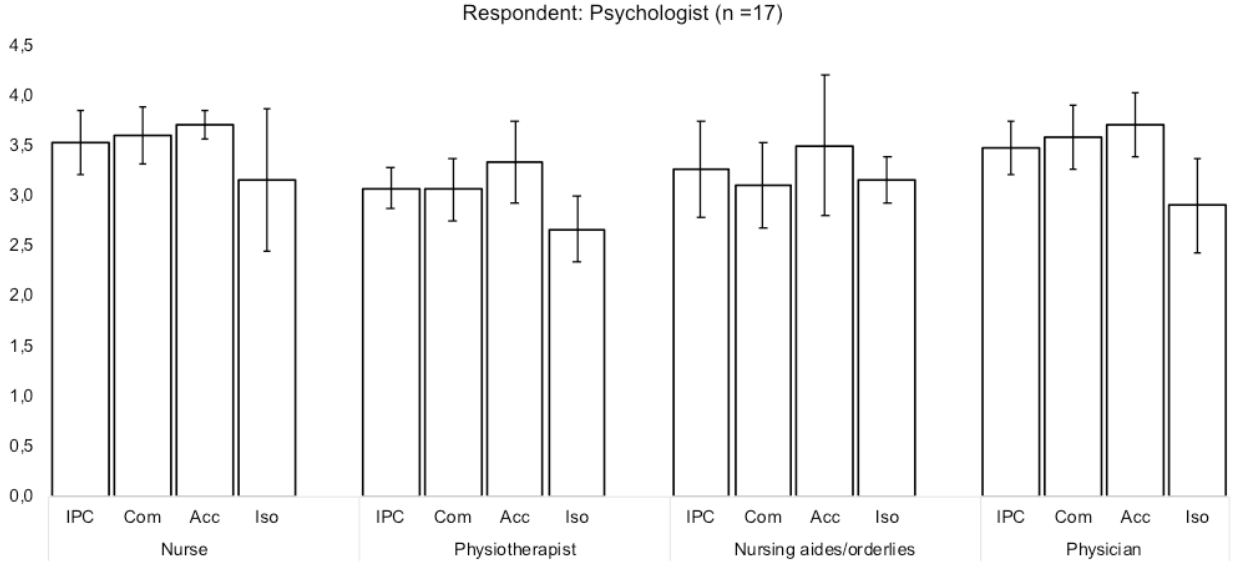





Respondent: Nursing aides/orderlies (n =26)
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
IPC Com Acc Iso
Physician
IPC Com Acc Iso
Nurse
IPC Com Acc Iso
Physiotherapist
IPC Com Acc Iso
Psychologist
IPC Com Acc Iso
Midwife


Respondent: Physician (n =31)
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
IPC Com Acc Iso
Nursing aides/orderlies
IPC Com Acc Iso
Physiotherapist
IPC Com Acc Iso
Health social worker
IPC Com Acc Iso
Psychologist
IPC Com Acc Iso
Midwife


Respondent: Physiotherapist (n =60)
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
IPC Com Acc Iso
Physician
IPC Com Acc Iso
Nurse
IPC Com Acc Iso
Nursing aides/orderlies
IPC Com Acc Iso
Psychologist


Respondent: Psychologist (n =17)
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
IPC Com Acc Iso
Nurse
IPC Com Acc Iso
Physiotherapist
IPC Com Acc Iso
Nursing aides/orderlies
IPC Com Acc Iso
Physician

studies (21) – while variations between other professional groups were evident.

The results for the three factors (accommodation, communication and isolation), which combined to form the IPC values, revealed a more nuanced picture than that reported by Wieser et al. (21). The values of accommodation and communication were generally higher than that for isolation. The only case in which the value attributed to isolation, which describes the absence of collaboration, was equal to that of accommodation and communication was in the evaluations made by nursing aides/orderlies with regard to midwives. This case refers to collaborative relationships between professions that are hierarchically different since it is assumed that midwives, for example, have a higher level of education than nursing aides/orderlies. This difference could be due to the presence of hierarchy in the roles played, and may be a source of conflict in interprofessional healthcare. This conflict can derive from different aspects, such as, for example, the idea that more educated professions, such as physicians, should take on the role of team leader, or it could arise form experiences of feeling marginalized while working in a group (31), or from the fact that specific behaviours and attitudes tend to either reinforce or attempt to restructure traditional power relationships (32).

Apart from the above-mentioned case of a high level of isolation, interprofessional collaboration in the Local Health Unit-IRCCS in Reggio Emilia was generally acceptable as rated according to the IPS scale.

Conclusions

With regard to the IPC frequencies revealed here, the data confirm the findings of other previous studies; for example, the work by Wieser et al. (21) identified that some professions, such as physicians and nurses, collaborate more than other workers, such as physiotherapists and dieticians. Our study found that nursing aides/orderlies, nurses and physicians collaborate more regularly than other professions, such as midwives, physiotherapists and psychologists, who have less opportunity to work together. Indeed, the finding that collaborations are lacking between certain professional groups was not unexpected since it had already been highlighted by others (33, 34,11). The absence of collaboration could be due to the organizational requirements, such as rotation plans, work schedules or the kinds of patient treated on a ward.

The main limitation of this study is the relatively narrow sample size since only approximately six percent of health professionals working at the Local Health Unit-IRCCS in Reggio Emilia participated in the survey. Second, the study is a purely descriptive investigation and this does not allow the reported data to be generalized to other contexts. Indeed, new studies are needed to analyse interprofessional collaborations in more depth by applying the IPC scale to a different geographical area, for example to health organizations located of Central and Southern Italy. Furthermore, useful data could come to light by focussing on specific wards, such as the emergency department, the paediatric or other specific departments where interprofessional collaboration is key to the delivery of high-quality care. A further application of the IPC scale could be the comparison of IPC between public health organizations versus private health organizations. A final consideration concerns the research method. Since some health professionals are underrepresented in hospitals, for example, dieticians, psychologists and psychiatric technicians, other research methods should be considered, such as the qualitative approach (35), to investigate the teamwork in these professions.

Conflicts of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

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Received: 1 June 2021
Accepted: 28 June 2021
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