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Interprofessional collaboration in urgency and emergency network teams in the Covid-19 pandemic[a]

Colaboração interprofissional em equipes da rede de urgência e emergência na pandemia da Covid-19

Colaboración interprofesional en equipos de red de urgencia y emergencia en la pandemia de Covid-19

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Abstract

Objective: To compare interprofessional collaboration in urgency and emergency's teams before and after the first death by Covid-19 in Brazil. **Method:** Cross-sectional study carried out with health professionals from Urgency and Emergency Services in a city of São Paulo State. Data collection was conducted through Assessment of Interprofessional Team Collaboration Scale assessing three factors: Partnership, Cooperation and Coordination. For analysis, the sample was divided into Group A (before the first death by Covid-19 in Brazil) and Group B (after this date) using descriptive and comparative statistics. **Results:** In the comparison between groups (A = 94 and B = 60) Coordination factor was better scored after the start of the pandemic (p = 0.001). Tertiary services had higher scores when compared to secondary level in both groups. **Conclusion and implications for practice:** In complex and dynamic environments such as urgency and emergency sectors, teamwork and interprofessional collaboration are prominent during the pandemic. Interprofessional collaboration was strengthened in the analyzer's teams, with a significant increase in coordination of actions after first death by Covid-19 in Brazil.

Keywords: Emergencies; Interprofessional Relations; Cooperative Behavior; Patient Care Team; Coronavirus Infections.

Resumo

Objetivo: Analisar comparativamente a colaboração interprofissional nas equipes de urgência e emergência antes e após o primeiro óbito por Covid-19 no Brasil. **Método:** Estudo transversal correlacional realizado com profissionais de saúde de serviços de Urgência e Emergência em uma cidade do Estado de São Paulo. A coleta de dados foi conduzida com aplicação da Escala de Avaliação da Colaboração Interprofissional na Equipe para avaliar três fatores: Parceria, Cooperação e Coordenação. Para análise, a amostra foi dividida em Grupo A (antes do primeiro óbito por Covid-19 no Brasil) e Grupo B (após esta data) utilizando estatística descritiva e comparativa. **Resultados:** Na comparação entre os grupos (A = 94 e B = 60), o fator Coordenação foi melhor pontuado após o início da pandemia (p = 0,001). Os serviços terciários apresentaram pontuações superiores quando comparados aos de nível secundário em ambos grupos. **Conclusão e implicações para prática:** Em ambientes complexos e dinâmicos como setores de urgência e emergência, o trabalho em equipe e a colaboração interprofissional assumem destaque durante a pandemia. A colaboração interprofissional se fortaleceu nas equipes analisadas, com aumento significativo da coordenação das ações após o primeiro óbito por Covid-19 no Brasil.

Palavras-chave: Emergências; Relações Interprofissionais; Comportamento Cooperativo; Equipe de Assistência ao Paciente; Infecções por Coronavírus.

Resumen

Objetivo: Analizar en términos comparativos la colaboración interprofesional en equipos de urgencias y emergencias antes y después de la primera muerte por Covid-19 en Brasil. **Método:** Estudio transversal realizado con profesionales de la salud de los servicios de Urgencias y Emergencias de una ciudad del estado de San Pablo. La recopilación de datos se realizó utilizando la Escala de Evaluación de Colaboración Interprofesional en el Equipo para evaluar tres factores: Asociación, Cooperación y Coordinación. Para el análisis, la muestra fue dividida en el Grupo A (antes de la primera muerte por Covid-19 en Brasil) y el Grupo B (después de esta fecha) mediante estadísticas descriptivas y comparativas. **Resultados:** En la comparación entre grupos (A = 94 y B = 60), el factor de Coordinación se calificó mejor después del inicio de la pandemia (p = 0.001). Los servicios terciarios obtuvieron puntajes más altos en comparación con el nivel secundario en los dos grupos. **Conclusión e implicaciones para la práctica:** En contextos complejos y dinámicos como los sectores de urgencia y emergencia, el trabajo en equipo y la colaboración interprofesional fueron resaltados durante la pandemia. La colaboración interprofesional se fortaleció en los equipos analizados, con un aumento significativo en la coordinación de acciones después de la primera muerte por Covid-19 en Brasil.

Palabras clave: Urgencias Médicas; Relaciones Interprofesionales; Conducta Cooperativa; Grupo de Atención al Paciente; Infecciones por Coronavirus.

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INTRODUCTION

Teamwork is necessary to provide quality and safe care to the user, promote well-being among health professionals and consequently generate positive financial results for care organizations.[1,2]

Interprofessional teams are defined as those that share objectives, responsibilities, work together and have clarity in their professional roles. The actions performed in the patient care team are paramount in complex, unpredictable and urgent situations[3] and depend on communication between their members to improve care results,[4] as in the case of the Covid-19 pandemic.

At the end of 2019, Coronavirus infections began to occur (referred to as SARS-CoV-2 and causing the Covid-19 disease), considered an RNA virus that causes respiratory infections, emerging in Wuhan, China.[5] Approximately 80% of the patients manifest the disease asymptomatically; however, in the other 20%, hospital interventions may be required due to complications.[6] In Brazil, the first confirmed case occurred on February 26th, 2020,[7] with the first death recorded on March 17th of the same year.[8]

In this context, the interprofessional collaboration established between professionals from different health areas has been highlighted, due to its power in dealing with unpredictability and providing the articulation of the technical knowledge of professionals who make up health teams at different levels of the care network. Comparatively, teamwork is more integrated than interprofessional collaboration, which is characterized by more flexible and fluid interactions, with the presence of complex tasks[1] in networks, recognized for their contribution to interprofessional health practice,[9] with articulation of different services.

In Brazil, the public and universal Unified Health System (*Sistema Único de Saúde*, SUS) is composed of a wide network that includes urgency and emergency (UE) services. During the Covid-19 pandemic, it is the place where the worsening cases of the disease are faced.[10]

The Urgency and Emergency Care Network (*Rede de Atenção às Urgências e Emergências*, RUE) in the SUS was created with Ordinance No. 1,600 in 2011, comprising Health Surveillance, Primary Health Care, Mobile Emergency Care Service (*Serviço de Atendimento Móvel de Urgência*, SAMU), Regulation Centers, Health Units with Stabilization Room, Emergency Care Units (*Unidades de Pronto Atendimento*, UPA 24h), Hospital Care and Home Care. Its purpose is to articulate and integrate health services with agility and humanization to patients in critical UE situations. The network is organized by a regulated and hierarchical system that qualifies hospital entrance doors with uninterrupted service to the spontaneous demands.[11]

In the last decade, attendance at the UE units grew, on average, 2.4% per year and, when there is a large-scale epidemiological event (such as the Covid-19 pandemic), the environment is strained with the increase in the demand for care.[12]

UE sectors face limitations on human, structural and material resources that are aggravated by the unpredictability and severity of the cases, factors that can interfere with quality of care.[13] Many challenges faced in the work environment by health professionals have intensified with the Covid-19 pandemic. There is a growing demand, scarcity of resources, improvised facilities for care in UE and the displacement of health professionals to other regions, where they have never worked together, an aspect that can compromise communication and coordination considered essential during a pandemic.[14] These tensions observed in the context of interaction between professionals and clinical outcomes in the UE services can be minimized with investments in interprofessional collaboration.

The literature points out to developments in interprofessional collaboration in reducing clinical errors, with impacts on patient safety and a consequent improvement in quality of care.[4,15] In this context, based on the assumption that the understanding of the severity of the pandemic may have been driven by Covid-19's first death recorded in Brazil, which consists of the outline defined for this investigation, the relevance of this study is highlighted.

The potential of interprofessional collaboration in the context of the RUE, together with the situation faced by health teams during the pandemic, gave rise to the following question: What are the effects of the Covid-19 pandemic on interprofessional collaboration in urgent and emergency services? An increase in interprofessional collaboration after the first death by Covid-19 recorded in Brazil was defined as a hypothesis. Thus, the objective is to comparatively analyze interprofessional collaboration in the urgency and emergency teams before and after the first death by Covid-19 in Brazil was recorded.

METHOD

A cross-sectional study carried out in the services of the RUE of a municipality in the inland of São Paulo, linked to the SUS, which include two hospitals with UE medical services, a SAMU unit and three UPAs.

The intentional sample consisted of 154 health professionals (Social Assistants, Nursing Assistants or Technicians, Nurses, Physiotherapists, Physicians, Speech Therapists, Orthopedics Technicians and Radiology Technicians) and support staff (Drivers or Rescuers, Regulatory Assistant Telephonists - TARM, managers and supervisors of the RUE units).

Among the participants, all the health professionals who worked in the UE units, during the data collection period, with a minimum professional experience of three months in the team, in the service and who agreed to participate in the research were included.

Data collection took place between June 2019 and April 2020 using two instruments: one to characterize the participants containing socio-professional data and another to measure interprofessional collaboration between the team members - "*Assessment of Interprofessional Team Collaboration Scale II (AITCS II)*"[16,17] in its version translated and validated for Portuguese in Brazil[18]: *Escala de Avaliação da Colaboração Interprofissional na Equipe II* (AITCS II). The scale items represent three constructs considered fundamental for interprofessional collaboration in health: Partnership (8 items), Cooperation (8 items) and Coordination

(7 items), totaling 23 statements organized on a five-point Likert scale (5 - always, 4 - most of the time, 3 - occasionally, 2 - rarely and 1 - never).[18]

One of the researchers went to the units and, during the work shift, invited the professionals to clarify the research objective and to submit the Free and Informed Consent Term in two counterparts. After signing, the instruments were distributed and elucidated to the participants with filling and collection at the time of the approach (day shift) or later (night shift), being collected by the researcher within a maximum time of seven days. The professionals who answered on the spot took approximately 15 minutes to complete the instruments.

For analysis, the sample was divided into two groups considering the date of registration of the first death due to the Covid-19 in Brazil[8] (Group A - before 03/17/2020 and Group B after this date), based on the assumption that the understanding of the pandemic's severity may have been driven from that moment on. The characterization data were analyzed using descriptive (frequency and percentage) and comparative statistics. The AITCS II scores were compared in relation to the two groups and, also, depending on the variables: working time; professional performance, and schooling. Intra-group comparisons were made for the UE services classified by secondary (UPAs, SAMU),tertiary (hospitals) levels, working time in the teams and service modality, grouped into Emergency Care (EC), being "Mobile EC", "Fixed EC", and "Support Multiprofessional".

The IBM SPSS® Statistics 23 computer program was used to apply the following statistical analyses: descriptive analyses (frequencies, percentages, mean and standard deviation) to characterize the sample and the scores obtained with the application of AITCS-II; group comparison analyses using non-parametric tests (Mann-Whitney – *U* and Kruskal-Wallis – K-W). The level of significance adopted in these last analyses was $p \leq 0.05$.

This study adopts the ethical percepts of the Resolutions 466/2012[19] and 510/2016[20] of the National Health Council, and was approved by the Research Ethics Committee - CAEE 09271419.3.0000.5504, opinion No. 3,213,199/2019 and amendment No. 4,009,498/2020.

RESULTS

Among the 154 health professionals who participated in the survey, females predominated (108; 70.1%) and, in relation to age, the range was from 20 to 67 years old (M = 38.8; SD = 8.9). Most were Nursing Assistants or Technicians (69; 44.8%), followed by Nurses (39; 25,3%), Physicians (17; 11%), Drivers or rescuers (9; 5.8%), Physiotherapists (8; 5.2%), TARM (6; 3.9%), Speech therapists (3; 1.9%), a Social worker (0.6%), an orthopedics technician (0.6%) and a radiology technician (0.6%).

Predominantly, the professional's time in the team was from one to five years (87, 56.5%) and between six and 10 years (24; 15.6%), the others had less than one year in the team (21; 13.6%), between 11 and 15 years (13; 8.4%) and others, also 16 years or more (9; 5.8%).

As for training/education, the vast majority was Specialist (57; 37%) or completed vocational technical courses (44; 28.6%), the others had completed Higher Education (32; 20.8%), Master (8; 5.2%), High School (7; 4.5%), Doctorate (5; 3.2%) and Postdoctoral (1; 0.6%).

The mean score obtained for each factor of the AITCS II (1. Partnership; 2. Cooperation; 3. Coordination) and the total score (Collaboration) before the registration of the first death by Covid-19 in Brazil (n = 94, Group A) was compared to the values identified by the participants after this event (n = 60, Group B), significant differences in the Total Collaboration Score ($p = 0.002$) were captured specifically by Factor 3. Coordination ($p = 0.011$) - Table 1.

The services of the RUE were classified as Secondary and Tertiary, as mentioned above, and the scores of the scale factors (AITCS II) were compared within each Group (before and after 03/17/2020). Tertiary services presented higher scores on all scale factors in Groups A and B; however, a significant result was observed only in Group A (before the first death by Covid-19 in Brazil), with higher scores in tertiary level services for the following factors: Partnership ($p = 0.001$), Coordination ($p = 0.048$) and total score - Collaboration ($p = 0.001$) - Table 2.

The scores obtained before and after 03/17/2020 - Groups A and B - were also compared according to the service modality

Table 1. Comparison between the mean scores of the AITCS II factors before and after the registration of the first death by COVID-19 in Brazil. São Carlos, SP, Brazil, 2020 (n = 154)

AITCS II dimensions	Group A (n = 94)		Group B (n = 60)		*p*
	M	SD	M	SD	
Factor 1. Partnership	3.23	1.08	3.46	0.94	0.253
Factor 2. Cooperation	3.93	0.77	4.12	0.75	0.175
Factor 3. Coordination	2.84	0.80	3.37	0.95	0.011
Total score. Collaboration	3.36	0.73	3.66	0.71	0.002

Source: Research Database.
AITCS II: Evaluation Scale for Interprofessional Collaboration in Team II; Group A: Collection before 03/17/2020; Group B: Collection after 03/17/2020; M = Mean; SD = Standard Deviation; *p* obtained in the Mann-Whitney test.

(Mobile EC, Fixed EC, and Support Multiprofessional) for analysis of teams with significant differences both in Group A and in Group B, in the Partnership factor (p = 0.003 and p = 0.001, respectively) and in the total Collaboration score (p = 0.014 and p = 0.007). In Group A, the Support Multiprofessional service had higher mean scores and, in Group B, lower mean scores were significant in the Fixed EC teams - Table 3.

When performing the intra-group comparison of working time in the teams by factor of the AITCS II scale, significant differences were identified in Group B in the Cooperation (p = 0.039) and Coordination (p = 0.007) factors, as well as in the total score of Collaboration (p = 0.027), with higher scores among the professionals who had less than a year working together, compared to those who had between 11 and 15 years of work in the team.

The "working time", "schooling" and "area of performance" variables for each member of the teams did not show significant differences when compared with the before-and-after the record of the first death in Brazil by Covid-19.

DISCUSSION

Diverse evidence of validity and reliability of the AITCS II in Brazilian samples was been previously demonstrated[18,21] and this is the first study to apply it to the RUE in Brazil to measure interprofessional collaboration in a complex service context, also considering the confrontation of an unprecedented pandemic.

The application of AITCS II proved to be relevant for identifying constructs that require strengthening in the context of interprofessional collaboration, through the dimensions of Partnership, Cooperation and Coordination. The teams in the RUE showed positive trends in interprofessional collaboration that can signal significant effects on quality of care, with emphasis on the mutual support of the teams to face the adversities imposed by the pandemic.

A recent review[15] on the topic in hospitals pointed out that interprofessional collaboration was related to the improvement of clinical outcomes, patient satisfaction, team satisfaction, post-hospital discharge performance, quality of care, safety and efficiency, work engagement, reduction of burnout and stress,

Table 2. Comparison between the mean scores of the AITCS II factors and the level of care of the services in the groups before and after the registration of the first death by COVID-19 in Brazil, São Carlos, SP, Brazil, 2020 (n = 154)

Dimensions AITCS II	*Group A*					*Group B*				
	Secondary (n = 56)		Tertiary (n = 38)		*p*	Secondary (n = 28)		Tertiary (n = 32)		*p*
	M	SD	M	SD		M	SD	M	SD	
F1. Partnership	2.84	1.06	3.81	0.82	0.001	3.20	1.09	3.68	0.72	0.095
F2. Cooperation	3.82	0.77	4.09	0.76	0.126	4.20	0.82	4.05	0.68	0.197
F3. Coordination	2.71	0.81	3.04	0.75	0.048	3.32	0.98	3.41	0.93	0.656
TS. Collaboration	3.14	0.71	3.67	0.65	0.001	3.58	0.76	3.73	0.66	0.454

Source: Research Database.
AITCS II: Evaluation Scale for Interprofessional Collaboration in Team II; F1: Factor 1; F2 Factor 2; F3: Factor 3; TS: Total Score; Group A: Collection before 03/17/2020; Group B: Collection after 03/17/2020; M = Mean; SD = Standard Deviation; *p* obtained in the Mann-Whitney test.

Table 3. Comparison between the mean scores of the AITCS II factors and the service modality of the teams in the groups before and after the first death by Covid-19 recorded in Brazil, São Carlos, SP, Brazil, 2020 (n = 154)

Dimensions AITCS II	Group A			p	Group B			*p*
	Mobile EC (n = 14)	Fixed EC (n=64)	Support (n = 16)		Mobile EC (n = 8)	Fixed EC (n = 48)	Support (n = 4)	
	M (SD)	M (SD)	M (SD)		M (SD)	M (SD)	M (SD)	
F1. Partnership	3.29 (1.12)	3.03 (1.04)	4.00* (0.87)	**0.003**	4.30 (0.62)	3.23* (0.87)	4.50 (0.61)	**0.001**
F2. Cooperation	4.17 (0.38)	3.85 (0.84)	4.05 (0.71)	0.418	4.69 (0.37)	4.02 (0.75)	4.13 (0.88)	0.065
F3. Coordination	2.96 (1.05)	2.74 (0.73)	3.12 (0.77)	0.196	3.96 (0.90)	3.25 (0.88)	3.67 (1.49)	0.104
TS. Collaboration	3.49 (0.73)	3.23 (0.71)	3.75* (0.66)	**0.014**	4.33 (0.56)	3.51* (0.63)	4.13 (0.96)	**0.003**

Source: Research Database.
AITCS II: Evaluation Scale for Interprofessional Collaboration in Team II; F1: Factor 1; F2 Factor 2; F3: Factor 3; TS: Total Score; Group A: Collection before 03/17/2020; Group B: Collection after 03/17/2020; EC: Emergency Care; M = Mean; SD = Standard Deviation; *p* obtained in Kruskal-Wallis – *k-w*. * The significant results obtained in the *k-w* test were better investigated through *post hoc* analysis of paired comparisons with the Mann-Whitney test at the level of p ≤ 0.05.

error rates, staff turnover, permanence rates, length of stay, morbidity and mortality rate.

The relationships established among the professionals in the UE services and the articulation of the health actions are organized, mainly, to meet life-threatening situations.[22,23] In the management of Covid-19, users with signs of worsening (Severe Acute Respiratory Syndrome) should spontaneously seek UE units, or be referred to these services for clinical stabilization.[6]

This study made it possible to identify, prior to the Covid-19 pandemic, that interprofessional collaboration was occasional between the teams in the services surveyed with lower scores in the Coordination factor. However, after the start of cases and deaths in the country, Coordination became the best rated factor by the teams in the UEs, making it possible to infer that, in the face of a national public health emergency, coordinated actions are taken to prevent and control the pandemic, ensuring the safety of the professionals and patients.[24]

Inter-professional coordination, as well as collaboration, requires the sharing of responsibilities between team members, interdependence, clarity of professional roles, tasks and objectives[3] to conduct health care through attributes considered indispensable in the context of unpredictability brought about by the pandemic.

Collaboration, communication and coordination are decisive and interrelated aspects in mitigating risks inherent to urgency and emergency care.[25] In this context, coordination can be understood with an emphasis on the care that needs to be coordinated along its path in the care networks, such as the RUE.

In order to have a collaborative practice, it is necessary that the teams collaborate with each other, and that the professionals collaborate with teams from other services, constituting a system of networks between professionals that present cooperative behavior. Without this collaboration element, integration between teams is useless.[26]

Communication for the coordination of care in clinical decision-making can involve formal and informal consultations. The dynamics of these consultations can be established by a synchronous or asynchronous approach mediated by technologies or face-to-face, whose choice will be defined based on the evaluation of the urgency of the expected clinical response. This care coordination mode favors obtaining information about the patient's case and care planning, improves decision-making, and contributes to quality of care[27] and to interprofessional relations.

The significant differences observed between the teams of secondary and tertiary care before the first death by Covid-19 in the Partnership and Coordination constructs and in the overall score of Interprofessional Collaboration require future investigations that make it possible to understand this result. It is known that, in the study scenario, the physicians who work in secondary care are intermittently on duty and, therefore, may have their bond impaired with the local teams due to the reduced time for working together. A number of studies highlight[28,29] that teamwork and interprofessional collaboration require communication and sharing that guarantees frequent contact, sociability and mutual recognition among its members.

With interprofessional collaboration, gaps between different professional categories can be overcome, based on the articulation of points of view regarding user care, cooperative behavior with constant exchange of knowledge and changes in the performance of tasks, which will not be exclusively centered on their role, but in collaborating with the other team members. Comparatively, the investment in overcoming the gaps for collaboration stands out in hospital care, according to the results of another study.[30]

The time working together and sharing the same physical space is important for strengthening sociability, integrating teamwork and interprofessional collaboration.[28] In the RUE, the findings revealed significant differences in the group of professionals who had less than one year working together and 11 to 15 years of work, showing the investments of these professionals in cooperating and coordinating care actions together.

In one study, the organization of work in an urgency and emergency sector was analyzed, which evidences the importance of interaction and articulation of the interprofessional team during serious care and at the time of assistance, as all the professionals need to act as quickly as possible for restoring life. In the interprofessional relationships, at the time of care with greater complexity in the emergency department, each health professional understands their role, and admits the importance of interprofessional interaction in favor of the same objective.[22]

The number of professionals participating in the research distributed in the different service modalities (Mobile EC, Fixed EC and Support) is justified by the structure and organization of work in the studied municipality. Even without a quantitative balance in the composition of the groups, it was possible to identify that, in the fixed care units, interprofessional collaboration still needs to be strengthened in the context of a pandemic.

However, the data from this research demonstrated the difference in collaboration between secondary and tertiary services, indicating the need for further studies of mixed methods to support the deepening of the comparative analysis of the teams mentioned, and the qualitative observation of interprofessional collaboration and the contextualization of pandemic demands can significantly enrich the submitted analysis.

The findings of this research can contribute to the management of the UE services that were already experiencing difficulties and were added to the demands of this health crisis. Such teams need to strengthen networking and collaboration to address, in addition to clinical needs, social and economic issues that already affect or will affect users and health workers.[31]

CONCLUSION AND IMPLICATIONS FOR THE PRACTICE

In complex and dynamic environments such as urgency and emergency sectors, teamwork and interprofessional collaboration are prominent during the social and health crisis of the Covid-19 pandemic. The constant partnership and integration of different professional knowledge for shared decision-making

represents an important strategy for a qualified response to the uncertainties and instabilities faced in health care.

This study showed the strengthening of interprofessional collaboration, with emphasis on the coordination construct in the context of the Covid-19 pandemic, which confirms the study hypothesis and reflects the indispensable need to reorganize the health teams' work process.

It is understood that the main limitation of the study refers to the sample, due to its small size, without random and balanced definition for the definition of the groups that were compared. It is also considers that the context of the pandemic may have impacted on the availability of professionals in urgency and emergency services to participate in the study.

The comparative analysis of the collaboration by level of care showed the trend for higher scores in tertiary-level services and requires further investigation of this form of work organization in different modalities of the RUE including fixed and mobile EC.

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