INTERPROFESSIONAL EDUCATION AND READINESS FOR LEARNING IN MEDICAL STUDENTS: A LONGITUDINAL ANALYSIS

EDUCAÇÃO INTERPROFISSIONAL E PRONTIDÃO PARA A APRENDIZAGEM EM ESTUDANTES DE MEDICINA: UMA ANÁLISE LONGITUDINAL

EDUCACIÓN INTERPROFESIONAL Y DISPOSICIÓN PARA EL APRENDIZAJE EN ESTUDIANTES DE MEDICINA: UN ANÁLISIS LONGITUDINAL

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ABSTRACT

The growing complexity of healthcare necessitates interprofessional education (IPE) to foster collaborative practice. This longitudinal, quantitative study investigated the evolution of medical students' Readiness for Interprofessional Learning (RIPL) at FAMERP, a Brazilian institution. Using the RIPLS scale, 48 students from the 2021 cohort were assessed at entry (T1), end of the basic cycle (T2), and end of the clinical cycle (T3), focusing on three factors: Teamwork and Collaboration (F1), Professional Identity (F2), and Patient-Centered Healthcare (F3). Results indicated high initial readiness for F1 and F3, but F1 and F2 demonstrated no significant evolution, maintaining stability across the course. Conversely, F3 exhibited a notable non-linear "inverted U" pattern, with a significant increase from T1 to T2, followed by a significant decline from T2 to T3. This trajectory suggests that while students possess a strong initial predisposition towards patient-centered care, clinical training realities may challenge this attitude. These findings emphasize the dynamic, non-linear nature of RIPL and highlight the critical need for systematic, adaptive IPE interventions throughout medical curricula, especially during advanced clinical stages, to effectively cultivate and sustain collaborative competencies and patient-centered approaches.

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Keywords: Interprofessional Education. Readiness for Interprofessional Learning. Medical Students. Longitudinal Analysis. Patient-Centered Care.

RESUMO

A crescente complexidade da atenção à saúde exige a educação interprofissional (EIP) para fomentar a prática colaborativa. Este estudo longitudinal, de abordagem quantitativa, investigou a evolução da Prontidão para a Aprendizagem Interprofissional (RIPL) de estudantes de Medicina da FAMERP, uma instituição brasileira. Utilizando a escala RIPLS, 48 estudantes da turma de 2021 foram avaliados no ingresso (T1), ao final do ciclo básico (T2) e ao final do ciclo clínico (T3), com foco em três fatores: Trabalho em Equipe e Colaboração (F1), Identidade Profissional (F2) e Atenção à Saúde Centrada no Paciente (F3). Os resultados indicaram alta prontidão inicial para F1 e F3, porém F1 e F2 não demonstraram evolução significativa, mantendo estabilidade ao longo do curso. Por outro lado, F3 apresentou um padrão não linear notável em "U invertido", com aumento significativo de T1 para T2, seguido de declínio significativo de T2 para T3. Essa trajetória sugere que, embora os estudantes possuam forte predisposição inicial para o cuidado centrado no paciente, as realidades do treinamento clínico podem desafiar essa atitude. Esses achados enfatizam a natureza dinâmica e não linear da RIPL e destacam a necessidade crítica de intervenções sistemáticas e adaptativas de EIP ao longo do currículo médico, especialmente nas fases clínicas avançadas, para cultivar e sustentar efetivamente competências colaborativas e abordagens centradas no paciente.

Palavras-chave: Educação Interprofissional. Prontidão para a Aprendizagem Interprofissional. Estudantes de Medicina. Análise Longitudinal. Cuidado Centrado no Paciente.

RESUMEN

La creciente complejidad de la atención sanitaria exige la educación interprofesional (EIP) para fomentar la práctica colaborativa. Este estudio longitudinal, de enfoque cuantitativo, investigó la evolución de la Disposición para el Aprendizaje Interprofesional (RIPL) en estudiantes de Medicina de la FAMERP, una institución brasileña. Utilizando la escala RIPLS, 48 estudiantes de la cohorte 2021 fueron evaluados al ingreso (T1), al final del ciclo básico (T2) y al final del ciclo clínico (T3), centrándose en tres factores: Trabajo en Equipo y Colaboración (F1), Identidad Profesional (F2) y Atención Sanitaria Centrada en el Paciente (F3). Los resultados indicaron una alta disposición inicial para F1 y F3; sin embargo, F1 y F2 no mostraron una evolución significativa, manteniéndose estables a lo largo del curso. Por el contrario, F3 presentó un notable patrón no lineal en "U invertida", con un aumento significativo de T1 a T2, seguido de un descenso significativo de T2 a T3. Esta trayectoria sugiere que, aunque los estudiantes poseen una fuerte predisposición inicial hacia la atención centrada en el paciente, las realidades de la formación clínica pueden desafiar dicha actitud. Estos hallazgos enfatizan la naturaleza dinámica y no lineal de la RIPL y destacan la necesidad crítica de intervenciones sistemáticas y adaptativas de EIP a lo largo del currículo médico, especialmente en las etapas clínicas avanzadas, para cultivar y sostener eficazmente competencias colaborativas y enfoques centrados en el paciente.

Palabras clave: Educación Interprofesional. Disposición para el Aprendizaje Interprofesional. Estudiantes de Medicina. Análisis Longitudinal. Atención Centrada en el Paciente.

1 INTRODUCTION

The increasing complexity of healthcare systems and the demand for more comprehensive and patient-centered care have driven the search for new approaches in the training of health professionals. In this scenario, Interprofessional Education (IPE) emerges as a fundamental strategy to prepare future professionals capable of acting collaboratively, respecting the specificities of each area, and optimizing health outcomes. IPE, as advocated by the World Health Organization (WHO), is not merely a teaching methodology, but a pillar for transforming assistance models and building more effective and cohesive healthcare teams (World Health Organization (WHO), 2010). The evolution of the concept of health, which today encompasses planetary health, holistic health, health promotion, and sustainability, demands an interdisciplinary and collaborative response. This implies that the actions of healthcare teams can no longer occur in isolation, but rather in an integrated manner, centered on the needs of the patient and the community (Salm et al., 2021; World Health Organization (WHO), 2010; Kaplan et al., 2009; Koplan et al., 2009). Teamwork, therefore, transcends the mere coexistence of different professionals and consolidates as a mode of collective work that values the integration of knowledge, interdisciplinarity, and participatory management (Peduzzi et al., 2015). However, the transition from a predominantly uniprofessional training model to an interprofessional one does not occur without challenges. "Readiness for Interprofessional Learning" (RIPL) thus becomes a key concept. Introduced by Parsell and Bligh in 1999, RIPL measures students' degree of willingness to participate in interprofessional learning, encompassing dimensions such as teamwork and collaboration, professional identity, and patient-centered healthcare (Parsell & Bligh, 1999; Falk et al., 2013). Evaluating and understanding the evolution of this readiness throughout academic training, especially in courses as traditional as medicine, is essential for the continuous improvement of curricula and pedagogical practices. Despite the recognition of IPE's importance, student engagement, particularly among medical students, can be complex. Medical training historically focuses on developing a "monoprofessional" identity, which can hinder adherence to a collaborative model (Ericson et al., 2012; Morison & Jenkins, 2007; Rudland & Mires, 2005; Tunstall-Pedoe et al., 2003). Furthermore, logistical challenges, crowded agendas, and discussions about the most effective time to introduce IPE into the medical curriculum persist (Hudson et al., 2016; Berger-Estilita, Fuchs, et al., 2020). In this context, the present chapter longitudinally analyzes the readiness for interprofessional learning in medical students from a Brazilian institution, the Faculdade de Medicina de São José do Rio Preto (FAMERP), using the RIPLS scale. We seek to understand how the dimensions of Teamwork and Collaboration (F1), Professional Identity

(F2), and Patient-Centered Healthcare (F3) evolve throughout different phases of the medical course – entry, end of the basic cycle, and end of the clinical cycle. Based on this analysis, the aim is to discuss the implications of these findings for curriculum design and pedagogical strategies in interprofessional medical education, contributing to the training of health professionals better aligned with the needs of the 21st century.

2 FOUNDATIONS OF INTERPROFESSIONAL EDUCATION AND READINESS FOR LEARNING

Interprofessional Education (IPE) has been widely recognized as a crucial strategy for improving the quality and safety of healthcare (World Health Organization (WHO), 2010). In a world where health challenges are becoming increasingly multifaceted, collaboration among different health professions is not only desirable but imperative. To understand the essence of IPE, it is fundamental to explore its theoretical pillars and the tools used to assess its effectiveness.

2.1 THE CONCEPT OF INTERPROFESSIONAL EDUCATION (IPE)

IPE is defined as a teaching-learning methodology where students from two or more professions learn together, from each other, and about each other, with the purpose of enhancing collaboration and the quality of healthcare (World Health Organization (WHO), 2010). Unlike multiprofessional education, where professionals from different areas work side-by-side but independently, interprofessionalism implies active and interdependent integration, aiming for the joint resolution of problems based on the specificities of each area.

"Healthcare teamwork 'consists of a modality of collective work that contrasts with the independent and isolated way in which health professionals usually carry out their work in daily services, from the perspective of comprehensiveness, interdisciplinarity, and participatory and communicative management.'" (Peduzzi et al., 2015)

This concept contrasts with traditional uniprofessional training which often perpetuates silos of knowledge and practice, hindering effective communication and collaboration in the real work environment. IPE seeks to break down these barriers by promoting mutual respect, understanding of each professional's roles and responsibilities, and the development of communication and negotiation skills (Costa, 2007).

IPE initiatives are considered promising for providing more qualified, comprehensive, and effective care, as they allow for a better understanding of the determinants of the health-disease process and a search for alternatives to improve the quality and access to healthcare services (Körner et al., 2016). The ultimate goal is to optimize the performance of the

healthcare system, resulting in better health for populations, a better care experience for individuals, reduced costs, and improved professional work experience (Bodenheimer & Sinsky, 2014).

2.2 CHALLENGES IN IMPLEMENTING IPE IN MEDICAL TRAINING

Despite the clear benefits, the implementation of IPE in medical training faces significant resistance. Traditionally, the medical curriculum has been structured to develop a strong "monoprofessional" identity, with an intense focus on autonomy and the central role of the physician. This can create barriers to the acceptance and engagement in collaborative learning activities (Ericson et al., 2012; Morison & Jenkins, 2007; Rudland & Mires, 2005; Tunstall-Pedoe et al., 2003). The complexity of simultaneously teaching different disciplines, coupled with logistical problems, crowded academic agendas, and a lack of consensus on the ideal time to introduce IPE initiatives, represent considerable practical challenges. The choice between continuous "immersion" or periodic "exposure" to collaborative activities is also a point of debate (Hudson et al., 2016). Furthermore, evaluating IPE's effectiveness is crucial, given the investment of time and resources in preparing specialized scenarios, virtual environments, and curricular coordination (Lee et al., 2024).

2.3 THE CONCEPT OF READINESS FOR INTERPROFESSIONAL LEARNING (RIPL)

For IPE to be effective, "Readiness for Interprofessional Learning" (RIPL) is a fundamental prerequisite. This concept, proposed by Parsell and Bligh (1999), refers to students' willingness to participate in interprofessional learning experiences. The Readiness for Interprofessional Learning Scale (RIPLS) is a widely used instrument to measure this readiness.

Originally with four dimensions, the RIPLS version adapted and validated for Brazilian Portuguese by Peduzzi et al. (2015) presents three main factors:

- **Factor 1 (F1): Teamwork and collaboration.** This factor encompasses positive attitudes towards shared learning, teamwork, collaboration, trust, and respect among students from different professional areas. Items related to this factor explore students' perception of how collaboration can improve team effectiveness and patient care.
- **Factor 2 (F2): Professional identity.** This factor, in turn, reflects attitudes towards professional autonomy, the clinical objectives of each profession, and, at times, a competitive component. Notably, the Brazilian version includes items that express negative attitudes towards interprofessional learning, indicating the complexity of developing professional identity in a collaborative context.

- **Factor 3 (F3): Patient-centered healthcare.** This factor assesses students' positive attitude and willingness to understand patient needs from the patient's own perspective, valuing trusting relationships, compassion, and cooperation in the care process.

The ability to take another person's perspective, an essential element of empathy, also proves crucial for readiness in interprofessional learning (Visser et al., 2018). Thus, integrating interprofessional learning into the curriculum, promoting autonomous motivation, is a way for students to gradually develop this readiness, integrating it with the cognitive component of empathy and other curricular elements. Literature has shown that IPE can significantly improve attitudes towards mutual respect and interprofessional knowledge, becoming a viable approach to promote better collaboration (Saragih et al., as cited in Barros, 2025). Recent studies, such as the randomized controlled trial by Costa Marion et al. (2025), indicate that interprofessional simulation practice increases readiness for collaborative practice. However, the challenge lies in optimizing IPE interventions and identifying best practices for instruction and evaluation, ensuring that the impact of IPE goes beyond mere perceptions, translating into effective improvements in educational experience and in the training of professionals better equipped for the current healthcare scenario.

3 METHODOLOGY OF THE LONGITUDINAL STUDY

Understanding the evolution of readiness for interprofessional learning (RIPL) in medical students demands a robust methodological approach capable of capturing the nuances of attitudinal changes over time. The present study adopted a longitudinal, quantitative, and descriptive design to investigate this phenomenon, using a specific cohort of medical students from the Faculdade de Medicina de São José do Rio Preto (FAMERP).

3.1 STUDY DESIGN

The study was designed as a longitudinal, descriptive, and quantitative research. The longitudinal nature allowed for tracking the same group of students at different points in their training, capturing the dynamics of changes in their attitudes and perceptions about interprofessional learning. The quantitative approach, in turn, enabled systematic measurement and statistical analysis of data, lending rigor and objectivity to the results.

3.2 PARTICIPANTS

The study participants were students enrolled in the FAMERP medical course in 2021, who were over 18 years old. A general invitation was extended to this cohort. For the longitudinal analysis, students who responded to the questionnaires at three distinct time points were considered:

- **Time 1 (2021):** Corresponding to the time of entry into the university, representing the baseline of students' perceptions.
- **Time 2 (2022):** Collected at the end of the basic cycle, after a period of acclimatization and the beginning of fundamental disciplines.
- **Time 3 (2024):** Conducted at the end of the clinical cycle, when students had already undergone practical experiences and immersion in healthcare settings.

Of the initial 98 students, 52 responded to the questionnaires at all three time points and were included in the longitudinal analysis. However, 4 of them were excluded due to presenting discrepant values (outliers) in the scores, resulting in a final sample of 48 students for the comparative analyses over time.

3.3 MATERIALS AND DATA COLLECTION INSTRUMENTS

Two main instruments were used for data collection:

3.3.1 Instrument 1: Sociodemographic Variables Questionnaire (SVQ)

This semi-structured questionnaire was developed to collect contextual information and characterize the sample. It included closed questions about:

- **Sociodemographic data:** sex, age, marital status, number of children, family income, and history of physical activity.
- **Academic data:** professional category (if applicable), course period, and current course format (in-person, non-in-person).

3.3.2 Instrument 2: Readiness for Interprofessional Learning Scale (RIPLS)

The RIPLS is an internationally recognized psychometric scale for assessing readiness for interprofessional learning. In the present study, an adapted and validated version for Brazilian Portuguese by Peduzzi et al. (2015) was used, consisting of 27 items (the original version has 29 items). Responses are given on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

The Brazilian version of RIPLS is structured into three main factors:

- **Factor 1 (F1): Teamwork and collaboration:** With 14 items, this factor measures positive attitudes and willingness for shared learning, teamwork, collaboration, trust, and respect towards students from other professional areas.

- **Factor 2 (F2): Professional identity:** With 8 items, this factor explores attitudes towards professional identity. It includes items that refer to negative attitudes towards interprofessional learning and others that refer to professional autonomy and the clinical objectives of each profession, indicating a competitive component.
- **Factor 3 (F3): Patient-centered healthcare:** With 5 items, this factor assesses the positive attitude and willingness to understand patient needs from their own perspective, based on trust, compassion, and cooperation.

3.4 DATA COLLECTION PROCEDURES

The questionnaires and the Informed Consent Form (ICF) were digitized and constructed in an electronic format. The access link was disseminated to the 2021 medical class students via online platforms (WhatsApp or email). Additionally, the option of filling out a printed questionnaire was offered. The estimated average time for completing the instruments was 10 minutes. Data were collected in 2021, 2022, and 2024, according to the academic progression of the students.

3.5 DATA ANALYSIS

Data analysis was carried out in several stages, aiming to ensure the validity and reliability of the results:

3.5.1 Exploratory and Descriptive Analysis

Initially, descriptive statistics (mean, median, standard deviation, minimum and maximum values) were calculated for numerical variables, and frequency and proportion for categorical variables. The normality of continuous variables was assessed using graphs (histogram and boxplot) and the Shapiro-Wilk test, in addition to the Z-test for skewness and kurtosis. When normality was rejected, a transformation was applied to normalize the data.

3.5.1 Instrument Validation and Factor Score Calculation

The validation of the RIPLS structure in the sample was crucial. For this, two procedures were used:

- **Calculation of Dimensional Scores:** The mean of the marker items for each dimension was calculated to obtain the dimensional scores.
- **Calculation of Factor Scores via Confirmatory Factor Analysis (CFA):** The matrix of factor loadings from a previous study (Peduzzi et al., 2015) was used to estimate the correlation matrix of the items. Subsequently, a CFA was performed on this matrix to create a more refined measure of the dimensions. Model fit was verified by the χ^2

(chi-squared), χ^2/df (chi-squared per degree of freedom), RMSEA (Root Mean Square Error of Approximation), and CFI (Comparative Fit Index) indices. RMSEA values < 0.08 (with CI not reaching 0.10) and CFI ≥ 0.90 were considered acceptable for not rejecting the model.

3.5.2 Instrument Reliability

The reliability of the latent variables (factors) was assessed by Cronbach's α and McDonald's omega (ω). Acceptable reliability was considered for McDonald's omega values above 0.60. Factor scores were calculated for the years 2022 and 2024, following the same procedures as 2021, and standardized based on the 2021 baseline year to correct for possible comparison biases.

3.5.3 Longitudinal Analysis

To test the hypothesis of changes in readiness for interprofessional learning over time, repeated measures ANOVA techniques were applied. Assumptions of normality and sphericity were checked, with Mauchly's test for sphericity and the Z-test for skewness and kurtosis for normality. In cases of non-normal residuals, bootstrapping (1000 samples) was used to estimate the distribution of the F-statistic and the p-value. To assess the magnitude of changes, the partial eta-squared (η^2p) effect size was calculated for the global ANOVA test (0.01: small effect; 0.06: medium effect; 0.14: large effect). For variables significant in the global test, post-hoc tests were performed, and the effect sizes of pairwise comparisons were calculated using Cohen's d (0.00-0.19: very small effect; 0.20-0.49: small effect; 0.50-0.79: medium effect; ≥ 0.80: large effect).

All analyses were conducted using statistical software.

3.6 ETHICAL ASPECTS

The study was approved by the Research Ethics Committee of the Faculdade de Medicina de São José do Rio Preto (CEP - FAMERP) under CAAE 41220020.8.0000.5415 (opinion number 4.543.158, approved on February 17, 2021). All precautions were taken to ensure the confidentiality and anonymity of participants, safeguarding privacy and data confidentiality. The ICF was presented to all participants, guaranteeing their voluntary participation and the right to withdraw at any time without prejudice.

4 CHARACTERIZATION OF PARTICIPANTS AND EDUCATIONAL DATA

The demographic and educational analysis of FAMERP medical students offers a rich overview of the studied cohort's profile, revealing characteristics that may influence their readiness for interprofessional learning and their academic trajectory. Understanding these aspects is fundamental to contextualize the longitudinal RIPLS results.

4.1 DEMOGRAPHIC PROFILE OF STUDENTS

The sample of 98 initial participants, 48 of whom were included in the longitudinal analysis, presented a predominantly young profile with a slight male majority.

Table 1

Descriptive analysis of participants' demographic data

Variables	N = 98
Age	
Up to 20 years	64 (65.31%)
Between 21 and 30 years	32 (32.65%)
Between 31 and 40 years	2 (2.04%)
Biological Sex	
Female	44 (44.90%)
Male	54 (55.10%)
Gender Identity	
Woman	48 (48.98%)
Man	50 (51.02%)
Sexual Orientation	
Heterosexual	79 (80.61%)
Bisexual	3 (3.06%)
Homosexual	16 (16.33%)
Marital Status	
Single	94 (95.92%)
Married	2 (2.04%)
Stable Relationship	2 (2.04%)
Number of children	
None	96 (97.96%)
1	2 (2.04%)
Religion	
No Religion	44 (44.90%)
Afro-Brazilian	5 (5.10%)
Catholic	41 (41.84%)
Evangelical	6 (6.12%)
Spiritualist	1 (1.02%)
Oriental	1 (1.02%)

Source: Adapted from Barros (2025).

The demographic profile reflects a predominance of young people up to 20 years old (65.31%), indicating early entry into university and a primary dedication to studies. The majority of students are single (95.92%) and childless (97.96%), suggesting that the student body is in a phase of life with few family commitments, allowing greater focus on training. The slight male majority (55.10%) is an interesting datum, as it contrasts with the feminization

observed in many higher education courses, although it aligns with some studies in the medical field. Diversity in terms of sexual orientation and religiosity, with a significant portion declaring no religion (44.90%) and a distribution between Catholics (41.84%) and other beliefs, points to an academic environment potentially open to multiple perspectives. This openness is a facilitator for IPE, as exposure to different values can promote understanding and acceptance of teamwork (Zaher et al., 2022).

4.2 PARENTS' EDUCATIONAL AND SOCIOECONOMIC DATA

The analysis of parents' educational data and students' financial resources reveals a family environment of strong support for education.

Table 2

Descriptive analysis of parents' education and financial resources data

Variables	N = 98
Father's Education Level	
Don't know	2 (2.04%)
Incomplete elementary school	6 (6.12%)
Completed elementary school	3 (3.06%)
Incomplete high school	1 (1.02%)
Completed high school	13 (13.27%)
Incomplete higher education	7 (7.14%)
Completed higher education	65 (66.33%)
Incomplete postgraduate studies	1 (1.02%)
Mother's Education Level	
Incomplete elementary school	5 (5.10%)
Completed elementary school	4 (4.08%)
Incomplete high school	1 (1.02%)
Completed high school	14 (14.29%)
Incomplete higher education	5 (5.10%)
Completed higher education	69 (70.41%)
Main source of funds to pay for studies	
Own resources	90 (91.84%)
Family resources	3 (3.06%)
Will apply for an institutional scholarship	5 (5.10%)
Engages in paid activity?	
No	95 (96.94%)
Yes	3 (3.06%)

Source: Adapted from Barros (2025).

A striking characteristic is the high educational level of the parents, with the majority having completed higher education (66.33% of fathers and 70.41% of mothers). This datum suggests a strong family investment in education, which historically influences children's academic aspirations and educational success. Family cultural capital plays a crucial role, aligning with the findings of da Silva, Batista & Holanda (2025) on the importance of educational background in medical training. Furthermore, almost all students (96.94%) do not engage in paid activity, and the majority finance their studies with their own resources

(91.84%), which indirectly points to substantial family support. This full dedication to studies is a common aspect of traditional medical training, as observed by Rabelo et al. (2024). This scenario of support and academic focus can positively influence students' willingness for IPE experiences, as suggested by Tanrıverdi et al. (2025).

4.3 PRIOR EDUCATIONAL BACKGROUND

Students' educational history before entering FAMERP also reveals a specific pattern that may have implications for their interprofessional training.

Table 3

Descriptive analysis of students' Elementary and High School data

Variables	N = 98
Elementary School (ES)	
All or most in public school	26 (26.53%)
All or most in private school	72 (73.47%)
Course Type (ES)	
Regular - 1st to 8th grade	98 (100.00%)
High School (HS)	
All or most in public school	21 (21.43%)
All or most in private school	77 (78.57%)
Course Type (HS)	
Regular - 1st to 3rd grade	94 (95.92%)
Technical	4 (4.08%)
How many years ago did you finish high school?	
Last year	6 (6.12%)
1 to 5 years ago	78 (79.59%)
6 to 10 years ago	8 (8.16%)
More than 10 years ago	6 (6.12%)

Source: Adapted from Barros (2025).

The majority of students completed Elementary School (73.47%) and High School (78.57%) in private schools. This academic trajectory in private educational institutions, combined with the predominance of regular courses and relatively quick entry into university after High School (79.59% finished 1 to 5 years ago), suggests a focused and successful academic preparation for the competitive medical entrance exam. This profile, while providing a solid foundation for academic challenges, may, according to Rabelo et al. (2024), perpetuate a dominant biomedical model in academic centers, which can represent a challenge for the introduction of more humanistic and interprofessional approaches. Xyrichis (2025) points out that medical students often show regression in moral judgment, possibly due to an intense focus on technical skills at the expense of ethical and human aspects. However, the recent training of these students can also be an opportunity for the introduction of IPE concepts, as suggested by Zaher et al. (2022).

4.4 PREVIOUS EXPERIENCE WITH OTHER HIGHER EDUCATION COURSES

Participants' experience with other higher education courses is limited, reinforcing the idea of an early and directed career choice.

Table 4

Descriptive analysis of data related to other Higher Education Courses.

Variables	N = 98
Have you already attended another higher education course?	
No	83 (84.69%)
Yes	15 (15.31%)
Completed the course? (N=15)	
No	8 (53.3%)
Yes	7 (46.7%)
How long did you attend (for those who did not complete, N=8)	
Less than 50% of the course	4 (57.1%)
Less than 1 semester	3 (42.9%)
What was the reason for dropping out? (for those who did not complete, N=8)	
Did not identify with the course	5 (71.4%)
Others: preferred FAMERP	1 (14.3%)
Others: got into medicine, my first choice of course	1 (14.3%)
What type of institution was the course in? (N=14)	
Public	10 (71.43%)
Private	4 (28.57%)

Source: Adapted from Barros (2025).

The vast majority of participants (84.69%) did not attend another higher education course. Among the 15 who did, more than half did not complete it (53.3%), mainly because they did not identify with the course or had been accepted into medicine, their first choice. This suggests a student body with clear professional objectives and determination to pursue a medical career. However, the lack of previous experiences in other courses can represent a challenge for IPE, given that medical students often exhibit less favorable attitudes towards IPE compared to other areas, due to traditionally hierarchical training (Alruwaili et al., 2020). Interestingly, the predominance of public institutions among those who attended other courses (71.43%) may indicate prior exposure to diverse educational environments, which can contribute to a broader view of the healthcare system and the importance of interprofessional collaboration, aligning with the observations of Tanrıverdi et al. (2025).

4.5 STUDENT DATA AT FAMERP

The entry profile and expectations of students at FAMERP are indicative of a highly motivated group committed to the medical course.

Table 5

Descriptive analysis of FAMERP students' data.

Variables	N = 98
Your option for entry into FAMERP in the entrance exam was:	
General competition	79 (80.61%)
PIMESP: Student from public school	14 (14.29%)
PIMESP: Self-declared black, brown, or indigenous	5 (5.10%)
You entered FAMERP on the:	
First call	64 (65.31%)
Second call onwards	34 (34.69%)
Do you intend to continue the current course?	
No	1 (1.02%)
Yes	97 (98.98%)

Source: Adapted from Barros (2025).

The majority of students entered through general competition (80.61%) and on the first call (65.31%), highlighting the high competitiveness and strong academic preparation of these individuals. The overwhelming majority (98.98%) intend to continue the current course, demonstrating a high degree of satisfaction and alignment between expectations and the reality of their training. This highly motivated and focused profile can be an advantage for IPE, but, as Alruwaili et al. (2020) warn, medical training may still retain remnants of a hierarchical approach that needs to be overcome. The presence, albeit minority, of students from affirmative action programs (PIMESP) contributes to the diversification of the student body, a crucial aspect for the development of interprofessional competencies and a more humanized medical practice (de Carvalho et al., 2025; Rabelo et al., 2024). In summary, the profile of FAMERP students is that of a young, academically well-prepared group, with strong family support and high motivation for a medical career. While these characteristics can facilitate IPE, there are also challenges arising from a possible bias towards uniprofessional training. This characterization provides the necessary background for the analysis of readiness for interprofessional learning, exploring how it manifests and evolves in this specific group.

5 ANALYSIS OF RIPLS VALIDITY AND RELIABILITY

The quality of psychometric longitudinal study results depends directly on the validity and reliability of the instrument used. In the present work, the Readiness for Interprofessional Learning Scale (RIPLS) was the foundation for evaluating medical students' readiness. Therefore, a crucial methodological step involved an in-depth analysis of the validity of the factorial structure and the reliability of the RIPLS dimensions in the specific sample of FAMERP students.

5.1 SCORE CALCULATION PROCEDURES

To measure readiness for interprofessional learning, two score calculation methods were adopted, aiming for a comparative analysis and the selection of the most precise approach:

5.1.1 Calculation of Dimensional Scores

The first method consisted of calculating the mean of the items comprising each dimension (Factor 1: Teamwork and collaboration; Factor 2: Professional identity; Factor 3: Patient-centered healthcare). This is a more direct and conventional approach, frequently used to obtain an overall score for each subscale.

Table 6 details the descriptive statistics for these dimensional scores:

Table 6

Descriptive statistics of dimensional scores (baseline)

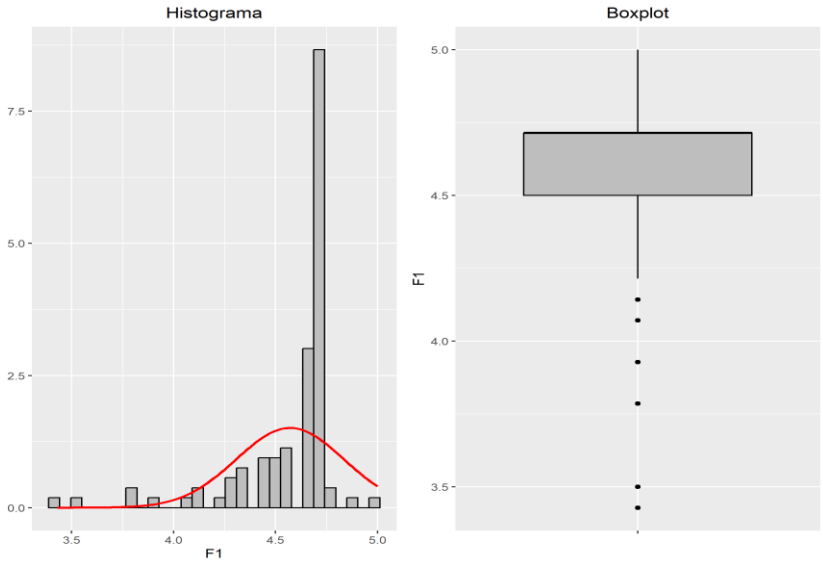
Variables	Mean	SD	W	p-value	Mn	P25	P50	P75	Mx
F1	4.57	0.26	0.70	0.00	3.43	4.50	4.71	4.71	5.00
F2	2.49	0.47	0.96	0.00	1.50	2.12	2.50	2.75	4.25
F3	4.84	0.33	0.55	0.00	3.00	4.80	5.00	5.00	5.00

Source: Adapted from Barros (2025).

In general, students showed high readiness for interprofessional learning in factors F1 (Mean = 4.57) and F3 (Mean = 4.84), indicating a strong initial willingness for collaborative work and patient-centered care. The exception was Factor 2 (Professional identity), with a mean of 2.49. The low score on this factor, which contains items with negative attitudes towards interprofessional learning, can be interpreted positively, suggesting an openness to a more collaborative "health professional" identity. This issue will be revisited later in the discussion. The distributions of the dimensional scores for F1, F2, and F3 were represented in figures in the research, showing different profiles of dispersion and skewness, which motivated further analysis via factor scores.

Figure 1

Graphical representation of the distribution of dimensional scores for Factor 1



Source: Adapted from Barros (2025).

Figure 1 presents a histogram with right-shifted bars and a boxplot indicating that most of the dimensional scores for F1 are concentrated at the higher values of the Likert scale, near 5.00, with a slightly left-skewed distribution, reflecting high readiness for teamwork.

5.1.2 Calculation of Factor Scores via Confirmatory Factor Analysis (CFA)

The second and more refined method for calculating scores involved Confirmatory Factor Analysis (CFA). Using the matrix of factor loadings from a previous study (Peduzzi et al., 2015), it was possible to estimate the factor scores for each dimension. This procedure is crucial because CFA allows verifying whether the theoretical structure of the instrument fits the observed data in the sample, producing more robust measures of the latent variables. The tested model showed an acceptable fit, with the following indices: $\chi^2(df) = 1133.926$ (321); CFI = 0.924; RMSEA = 0.088 [0.083, 0.094]. These values, particularly CFI > 0.90 and RMSEA close to 0.08, indicate that the three-factor structure of RIPLS is valid for the sample of FAMERP students. This validation is fundamental for the reliability of the scores used in the longitudinal analyses.

After validating the structure, reliability coefficients were calculated for each factor:

- **Factor 1 (Teamwork and collaboration):** Cronbach's α = 0.91 and McDonald's ω = 0.91.
- **Factor 2 (Professional identity):** Cronbach's α = 0.72 and McDonald's ω = 0.45.
- **Factor 3 (Patient-centered healthcare):** Cronbach's α = 0.85 and McDonald's ω = 0.85.

With the exception of Factor 2, all factors showed robust reliability measures (McDonald's ω > 0.60), indicating that their constituent items are internally consistent and reliably measure the construct. The moderate reliability of Factor 2 (ω = 0.45) is a point of attention, which will be further explored in the discussion, but it already suggests the inherent complexity in developing professional identity in the early stages of medical training.

The factor scores were subsequently transformed to preserve the correlation matrix between the factors, an essential methodological step to avoid biases in subsequent analyses. Table 7 shows the descriptive statistics for these transformed factor scores:

Table 7

Descriptive statistics of transformed factorial scores (baseline).

Variables	Mean	SD	W	p-value	Mn	P25	P50	P75	Mx
F1	0.00	0.71	0.65	0.00	-3.60	-0.02	0.35	0.40	0.58
F2	0.00	0.78	0.62	0.00	-0.72	-0.37	-0.23	-0.06	4.96
F3	0.00	0.65	0.63	0.00	-3.78	0.09	0.15	0.23	0.94

Source: Adapted from Barros (2025).

The figures in the research illustrate the distributions of these transformed factor scores. These distributions, unlike the raw dimensional scores, exhibit characteristics more aligned with the expected properties for factor scores, serving as a more appropriate starting point for longitudinal comparative analyses.

5.1.3 Correlations between Scores and the Importance of Factor Scores

The comparison between the correlations of dimensional scores (simple mean) and factor scores revealed the critical importance of methodological choice in analyzing data with latent variables.

Table 8

Correlations between different types of scores and true factor correlations.

	Correlations of Dimensional Scores[a]			Correlations of Factor Scores[b]			Correlations of Factors (True)[c]		
	F1	**F2**	**F3**	**F1**	**F2**	**F3**	**F1**	**F2**	**F3**
F1	1.00			1.00			1.00		
F2	-0.20	1.00		-0.37	1.00		-0.37	1.00	
F3	0.54	-0.18	1.00	0.07	0.10	1.00	0.07	0.10	1.00

Source: Adapted from Barros (2025).

As can be seen in Table 8, the use of scores calculated by the simple mean of items (dimensional scores) generated a significantly different pattern of correlations (with higher values) than that observed in the true correlations between latent variables (Factors). This

discrepancy is a warning, as the use of raw dimensional scores would add considerable bias to subsequent analyses. In contrast, the correlations of factor scores proved to be practically identical to the true correlations of the factors, demonstrating that this approach optimized the representation of scores and preserved the correlation structure between the latent variables. This methodological distinction highlights the importance of robust statistical approaches in IPE research, especially for accurately capturing the nuances of students' attitudes (Berger-Estilita et al., 2020a). The inherent complexity in measuring attitudes towards IPE requires precise measures to assess the impact of interventions (Alruwaili et al., 2020; Zaher et al., 2022; Tanrıverdi et al., 2025). Thus, for all subsequent and longitudinal comparative analyses, the calculated and transformed factor scores were chosen, ensuring greater reliability of the presented results.

6 LONGITUDINAL ANALYSIS OF READINESS FOR INTERPROFESSIONAL LEARNING

The longitudinal analysis of the RIPLS factors offers a dynamic view of the evolution of readiness for interprofessional learning among FAMERP medical students. By tracking students' perceptions at crucial moments in their training (entry, end of the basic cycle, and end of the clinical cycle), we can identify patterns of change, stability, or regression, which are fundamental for informing pedagogical strategies.

6.1 FACTOR 1: TEAMWORK AND COLLABORATION

Factor 1, "Teamwork and collaboration," is a central dimension of interprofessional readiness, reflecting students' willingness for joint action and recognition of the value of cooperation. The longitudinal analysis of this factor revealed interesting patterns.

6.1.1 Distribution and Descriptive Statistics

The figures in the research illustrate the distributions of F1 scores at each of the evaluated time points. The initial normality test indicated that the original distribution was not normal. To correct this non-normality and ensure the validity of parametric analyses, the data were transformed. After transformation, the normality hypothesis was not refuted.

Table 9 presents the descriptive statistics (mean and standard deviation) of the transformed F1 scores at the three time points:

Table 9

Descriptive statistics of Factor 1 (Teamwork and collaboration) over time.

Time	Mean (SD)
Time 1	-0.01 (1.03)
Time 2	-0.14 (0.95)
Time 3	-0.54 (1.14)

Source: Adapted from Barros (2025).

6.1.2 ANOVA Results and Post-Hoc Tests

Repeated measures ANOVA was applied to verify if there were significant changes in F1 scores over the three time points. Mauchly's test did not refute the sphericity hypothesis. The ANOVA results are presented in Table 10:

Table 10

ANOVA results for Factor 1 (Teamwork and collaboration)

Pair	SQ	num df	Error SQ	den df	F-value	p-value
(Intercept)	0.000	1.000	40.345	47.000	0.000	1.000
time	7.337	2.000	95.037	94.000	3.629	0.030

Source: Adapted from Barros (2025).

The global ANOVA test refuted the null hypothesis of equality of means over time (p = 0.030), suggesting a significant change in the factorial scores of F1. The normality of the error distribution was confirmed. Despite the significance of the global test, post-hoc tests (with Bonferroni correction) did not reveal statistically significant differences in pairwise comparisons between time points, as shown in Table 11:

Table 11

Post-hoc tests between time points for the variable Teamwork and collaboration.

Contrast	Estimated	Standard Error	df	t Ratio	p-value
Time.1 effect - Time.2 effect	-0.017	0.218	47	-0.079	1.000
Time.1 effect - Time.3 effect	0.470	0.197	47	2.380	0.064
Time.2 effect - Time.3 effect	0.487	0.200	47	2.440	0.056

Source: Adapted from Barros (2025).

This absence of significant differences between pairs of time points was corroborated by the wide confidence intervals of the effect sizes (Cohen's d) presented in Table 12, which indicated a very small effect for all pairwise comparisons.

Table 12

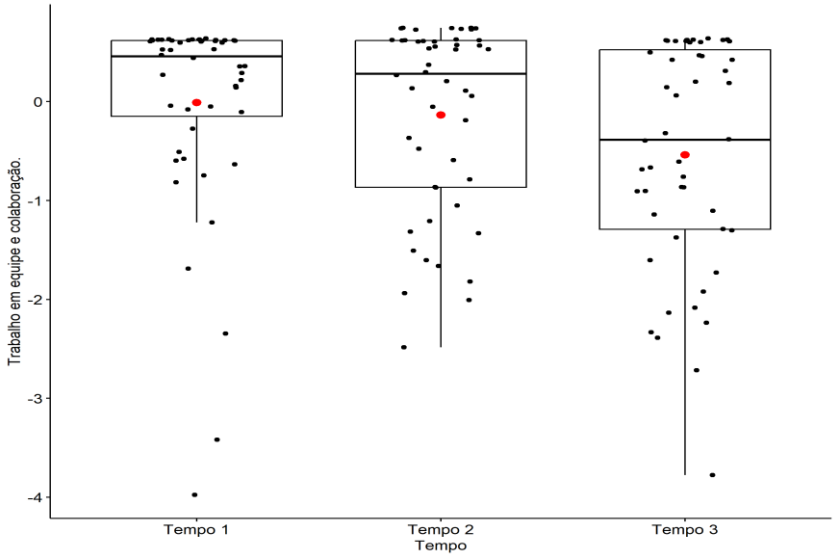
Effect Size of the variable Teamwork and collaboration between time points.

Contrast	Effect size	Standard Error	df	CI Lower	CI Upper
Time.1 effect - Time.2 effect	-0.018	0.222	47	-0.465	0.430
Time.1 effect - Time.3 effect	0.480	0.202	47	0.073	0.887
Time.2 effect - Time.3 effect	0.497	0.204	47	0.086	0.908

Source: Adapted from Barros (2025).

Figure 2

Boxplot representation of F1 scores at T1, T2, and T3



Source: Adapted from Barros (2025).

Figure 2, a boxplot of F1 scores over time, reinforces the perception of stability, with the means (red dots) remaining relatively close. In summary, despite the significance of the global ANOVA test, it is concluded that Factor 1, "Teamwork and collaboration," did not show significant evolution over the three evaluated periods in the medical training of FAMERP students.

6.2 FACTOR 2: PROFESSIONAL IDENTITY

Factor 2, "Professional identity," is a complex dimension of interprofessional readiness, reflecting how students perceive their own profession and interaction with others, sometimes incorporating a competitive bias. The longitudinal analysis of this factor is crucial for understanding how medical training influences the sense of professional identity in the interprofessional context.

6.2.1 Distribution and Descriptive Statistics

The figures in the research show the distributions of F2 scores in each period. As with F1, the initial normality test did not indicate normality of the distribution. Transformation was applied to normalize the data, and the normality hypothesis was not refuted after this intervention.

Table 13 details the descriptive statistics of the transformed F2 scores over time:

Table 13

Descriptive statistics of Factor 2 (Professional identity) over time.

Time	Mean (SD)
Time 1	0.01 (1.04)
Time 2	-0.12 (0.69)
Time 3	0.10 (0.92)

Source: Adapted from Barros (2025).

6.2.2 ANOVA Results

The application of repeated measures ANOVA for Factor 2 did not identify statistically significant differences in means over time. Mauchly's test failed to refute the sphericity hypothesis. Table 14 presents the ANOVA results:

Table 14

ANOVA results for Factor 2 (Professional identity).

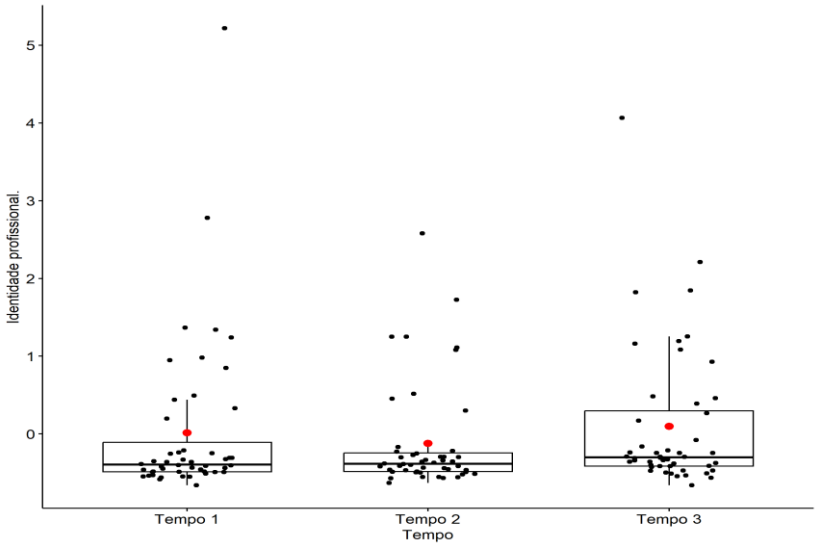
Pair	SQ	num df	Error SQ	den df	F-value	p-value
(Intercept)	0.000	1.000	47.744	47.000	0.000	0.994
time	3.307	2.000	91.150	94.000	1.705	0.187

Source: Adapted from Barros (2025).

With a p-value of 0.187, the global ANOVA test for F2 did not refute the null hypothesis, indicating that there were no statistically significant changes in students' perception of professional identity over the three time points. The normality of the error distribution was confirmed.

Figure 3

Boxplot representation of F2 scores at T1, T2, and T3.



Source: Adapted from Barros (2025).

Figure 3, a boxplot of F2 scores over time, visually corroborates this stability, with means fluctuating slightly, but without a clear trend of significant evolution or decline. The finding that "Professional identity" did not show significant evolution throughout the course is an important result that demands reflection on pedagogical approaches in medical training and how professional identity is constructed or modified in relation to interprofessional practice.

6.3 FACTOR 3: PATIENT-CENTERED HEALTHCARE

Factor 3, "Patient-centered healthcare," is one of the most sensitive and desired dimensions in the training of health professionals, reflecting the ability to prioritize patient needs and perspectives. The longitudinal analysis of this factor is crucial for understanding how this attitude develops or is challenged throughout medical training.

6.3.1 Distribution and Descriptive Statistics

The figures in the research illustrate the distributions of F3 scores in each period. The initial normality test indicated non-normality. After transformation, the normality hypothesis was not refuted.

Table 15 presents the descriptive statistics of the transformed F3 scores over time:

Table 15

Descriptive statistics of Factor 3 (Patient-centered healthcare) over time.

Time	Mean (SD)
Time 1	0.05 (0.94)
Time 2	2.24 (2.25)
Time 3	-0.03 (0.73)

Source: Adapted from Barros (2025).

6.3.1 ANOVA Results and Post-Hoc Tests

Repeated measures ANOVA for Factor 3 revealed highly significant changes over time. Mauchly's test did not refute sphericity. Table 16 presents the ANOVA results.

Table 16

ANOVA results for Factor 3 (Patient-centered healthcare).

Pair	SQ	num df	Error SQ	den df	F-value	p-value
(Intercept)	0.000	1.000	36.352	47.000	0.000	1.000
time	30.660	2.000	75.711	94.000	19.034	< 0.001

Source: Adapted from Barros (2025).

The global ANOVA test refuted the null hypothesis ($p < 0.001$), indicating a highly significant change in the means of Factor 3 over time. The normality of the errors was, however, refuted. To mitigate this, a bootstrapping ANOVA was performed, which confirmed the significant difference.

Post-hoc tests (with Bonferroni correction) detail the nature of these changes (Table 17):

Table 17

Post-hoc tests between time points for the variable Patient-centered healthcare.

Contrast	Estimated	Standard Error	df	t Ratio	p-value
Time.1 effect - Time.2 effect	-0.788	0.186	47	-4.241	< 0.001
Time.1 effect - Time.3 effect	0.308	0.155	47	1.982	0.160
Time.2 effect - Time.3 effect	1.096	0.205	47	5.343	< 0.001

Source: Adapted from Barros (2025).

There was a significant increase in F3 scores between Time 1 and Time 2 ($p < 0.001$), followed by a significant decrease between Time 2 and Time 3 ($p < 0.001$). The comparison between Time 1 and Time 3 was not statistically significant ($p = 0.160$). This "inverted U" trajectory is confirmed by the effect sizes (Cohen's d) presented in Table 18, which show large effects for the differences between T1-T2 and T2-T3.

Table 18

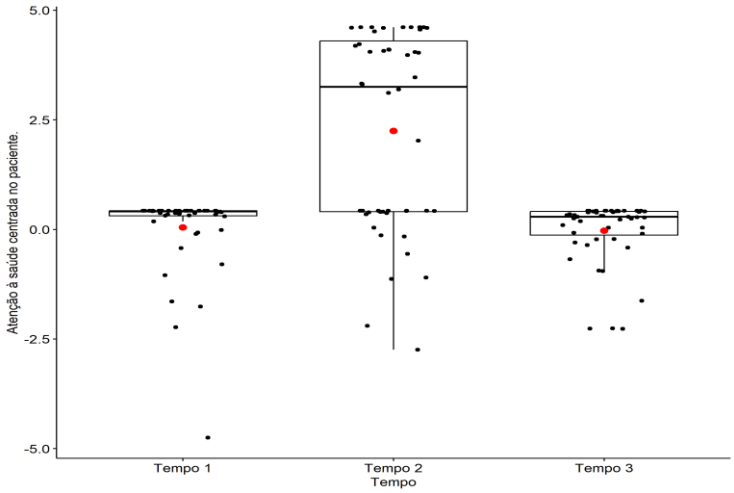
Effect Size of the variable Patient-centered healthcare between time points.

Contrast	Effect size	Standard Error	df	CI Lower	CI Upper
Time.1 effect - Time.2 effect	-0.884	0.215	47	-1.317	-0.451
Time.1 effect - Time.3 effect	0.345	0.178	47	-0.012	0.703
Time.2 effect - Time.3 effect	1.229	0.231	47	0.765	1.693

Source: Adapted from Barros (2025).

Figure 4

Boxplot representation of F3 scores at T1, T2, and T3.



Source: Adapted from Barros (2025).

Figure 4, a boxplot of F3 scores, visually captures this "inverted U" pattern, with a notable increase in the mean at Time 2 (end of the basic cycle) and a subsequent decline at Time 3 (end of the clinical cycle). This is the most dynamic result of the longitudinal study and suggests that readiness for patient-centered care is not a linear accumulation process, but rather a complex path with fluctuations influenced by the different phases of medical training.

7 DISCUSSION OF FINDINGS AND IMPLICATIONS FOR MEDICAL EDUCATION

The results obtained in this longitudinal study offer a unique perspective on the evolution of readiness for interprofessional learning in FAMERP medical students. The analysis of the three RIPLS factors – Teamwork and Collaboration (F1), Professional Identity (F2), and Patient-Centered Healthcare (F3) – at different stages of medical training reveals patterns that challenge linear conceptions of development and provide important insights for curriculum improvement.

7.1 INITIAL READINESS AND STABILITY IN F1 AND F2

FAMERP students demonstrated high initial readiness for interprofessional learning regarding the factors Teamwork and Collaboration (F1) and Patient-Centered Healthcare

(F3), as evidenced by the high mean dimensional scores at baseline (Time 1). This initial openness to collaboration and patient-centeredness is a strength and may reflect a generation of students more aware of the demands for more humanized and integrated healthcare. Berger-Estilita et al. (2020a) also observed favorable attitudes towards IPE in pre-clinical students, corroborating the trend of a positive predisposition upon entering undergraduate studies. However, the longitudinal analysis revealed that Factor 1 (Teamwork and collaboration) did not show significant changes over the three evaluated periods. Although the global ANOVA test indicated statistical significance, pairwise comparisons and effect sizes did not support differences between time points. This suggests that, despite high initial readiness, the experiences offered throughout the course may not be sufficiently impactful to promote a discernible evolution in attitudes towards teamwork and collaboration. Maintaining a high initial level is positive, but the absence of progression may indicate lost opportunities to deepen these competencies. This finding highlights the need for more targeted and continuous interventions that can catalyze more pronounced changes, and not just maintain the initial predisposition. Similarly, Factor 2 (Professional identity) also did not show significant changes over time. With lower initial scores compared to F1 and F3 (and with moderate reliability of the scale for this factor, which should be considered), the stability of F2 raises crucial questions. The items of F2, which include aspects of autonomy and at times a competitive perspective, may reflect the persistence of a traditional medical training model that tends to reinforce a "monoprofessional" identity rather than a more collaborative one (da Silva, Batista & Holanda, 2025; Rabelo et al., 2024). The absence of change in professional identity suggests that, even with the introduction of IPE concepts, curricular experiences may not be effectively modifying students' perceptions of their role in an interprofessional team, or that the complexity of developing a professional identity in training can generate fluctuations and uncertainties. Literature indicates that the formation of professional identity among medical students is complex (Alruwaili et al., 2020; Guinat, 2024), and the observed stability here may indicate the need for more incisive and continuous pedagogical interventions to cultivate a professional identity more aligned with the principles of interprofessionalism.

7.2 THE NON-LINEAR PATTERN OF FACTOR 3: PATIENT-CENTERED HEALTHCARE

The most intriguing and dynamic result of the longitudinal study was observed in Factor 3 (Patient-centered healthcare). This factor exhibited a non-linear pattern, characterized by a significant increase in scores between Time 1 (entry) and Time 2 (end of the basic cycle), followed by a significant decline between Time 2 and Time 3 (end of the clinical cycle).

This "inverted U" pattern suggests that readiness for patient-centered care is not a linear development, but a complex process influenced by different phases of training. The initial increase can be attributed to exposure to basic cycle disciplines that emphasize humanization, ethics, and the importance of the patient at the center of care, cultivating an "initial idealism" (Vanka et al., 2025). During this phase, students may be more receptive to these concepts in a theoretical environment. However, the decrease in scores at the end of the clinical cycle (Time 3) is a worrying finding. This may reflect the challenges and realities of clinical practice, where students are exposed to hospital environments that are often fragmented, with time pressures, established hierarchies, and a greater emphasis on disease than on the patient as a person. The transition from theory to practice can expose students to a reality that does not always correspond to the ideals of patient-centered care, leading to an adjustment of expectations or even a certain disengagement. Vasconcelos et al. (2023) and Prevedello et al. (2022) highlight the importance of considering attitudinal changes and fluctuations in the context of collaborative practice and health training. This decline may also be related to Xyrichis' (2025) observations about the regression in medical students' moral judgment as they deepen their practice, suggesting a conflict between humanistic ideals and the demands of the clinical environment.

7.3 IMPLICATIONS FOR CURRICULUM DESIGN AND PEDAGOGICAL STRATEGIES

The findings of this study have significant implications for curriculum design and pedagogical strategies in interprofessional medical education.

- **Continuous Reinforcement for F1 and F2:** The stability observed in Teamwork and Collaboration (F1) and Professional Identity (F2) since entry suggests that, although students begin the course with a good predisposition for collaboration, curricular initiatives may not be promoting active evolution in these dimensions. It is crucial that the medical curriculum integrates interprofessional experiences more systematically and progressively, going beyond isolated exposures. This includes creating opportunities for joint learning, interprofessional simulations, and practical activities that reinforce collaboration and the construction of a more collective and less hierarchical professional identity. Conte et al. (2022) and Yang et al. (2025) emphasize the continuous integration of interprofessional experiences to promote training more aligned with the demands of collaborative practice.
- **Strategic Interventions for Factor 3:** The non-linear pattern of Factor 3 (Patient-centered healthcare) points to the need for strategic and adaptive pedagogical interventions at different moments of the course. The peak of readiness in the basic

cycle should be capitalized, perhaps with more activities that reinforce these values before clinical immersion. The drop in the clinical cycle demands special attention, suggesting the need for continuous support, reflective discussions about the challenges of practice, and the creation of clinical environments where patient-centered care is explicitly valued and practiced. Almeida et al. (2020) and Marques and Costa (2024) reinforce the importance of integrating interprofessional education approaches consistently throughout the entire curriculum to promote more effective and sustainable patient-centered practice. Mentorship programs, debriefing of clinical experiences, and the presence of professional role models demonstrating patient-centered practice can be effective.

- **Overcoming the Uniprofessional Model:** The predominance of a student profile with strong academic preparation and a history in private schools, while advantageous in some aspects, may be linked to a bias towards the traditional biomedical model (Rabelo et al., 2024). The curriculum therefore needs to actively challenge this perspective, introducing and reinforcing interprofessionalism and humanization from the early years. The diversification of the student body, such as the presence of students from affirmative action programs (PIMESP), can also be a vector for more plural and sensitive training, enriching interprofessional learning.
- **Continuous and Adaptive Assessment:** The results highlight the importance of a longitudinal approach in assessing readiness for interprofessional learning. Pontual assessment may not capture the fluctuations and complexities of developing these competencies. Educational institutions need to implement continuous assessment systems that allow identifying trends, monitoring the impact of interventions, and adapting the curriculum according to students' needs at different stages. Oliveira et al. (2023) corroborate the importance of this longitudinal and adaptive approach in the training of health professionals.

7.4 STUDY LIMITATIONS AND FUTURE DIRECTIONS

This study, although robust in its longitudinal design, presents some limitations. The final sample of 48 students for longitudinal analysis is relatively small, which may have impacted the ability to detect statistically significant differences in pairwise comparisons for F1 and F2. Future studies with larger samples and in different institutions may corroborate or complement these findings.

Additionally, the study focused on students' perceptions through RIPLS. Qualitative methods, such as interviews and focus groups, could deepen the understanding of the

underlying reasons for the observed fluctuations and stabilities, capturing students' lived experiences. The inclusion of data on the implementation of IPE in the FAMERP curriculum and the perception of faculty would also enrich the analysis. Finally, future research should explore specific interventions based on these findings, testing the effectiveness of new pedagogical approaches to promote the development of interprofessional readiness, especially to reverse the decline in patient-centered care during the clinical cycle and to drive a more notable evolution in teamwork and professional identity.

8 CONCLUSION

The training of health professionals capable of facing the challenges of the 21st century requires an unwavering commitment to Interprofessional Education (IPE). This chapter, based on a longitudinal study with FAMERP medical students, aimed to map the evolution of readiness for interprofessional learning, using the RIPLS scale at three crucial moments of their academic trajectory. The results, although complex, offer valuable insights into the dynamics of this readiness and its implications for medical education. From entry, students demonstrated high readiness for Teamwork and Collaboration (F1) and Patient-Centered Healthcare (F3), indicating a positive predisposition for the pillars of interprofessional practice. However, the longitudinal analysis revealed that this readiness does not evolve linearly and progressively in all dimensions. Factor 1 (Teamwork and Collaboration) and Factor 2 (Professional Identity) remained stable throughout the course, suggesting that curricular experiences may not be sufficient to deepen or significantly modify these attitudes and perceptions. The most intriguing pattern emerged in Factor 3 (Patient-Centered Healthcare), which exhibited a non-linear behavior, with a notable increase at the end of the basic cycle, followed by a decline at the end of the clinical cycle. This "inverted U" highlights the potential challenges in the transition from theory to practice, where the realities of the clinical environment can impact students' ability to fully maintain and apply the principles of patient-centered care. This finding points to the urgent need for pedagogical interventions that not only introduce these concepts but also reinforce and protect them throughout training, especially in more advanced clinical stages. In summary, readiness for interprofessional learning is a dynamic and multifaceted construct, requiring an adaptive and continuous educational approach. The results of this study emphasize the importance of a medical curriculum that integrates IPE more intentionally and systematically, with strategies that promote the active development of collaboration skills, the formation of a more plural professional identity, and the sustenance of patient-centered care, from entry to graduation. Understanding these longitudinal patterns is a fundamental step towards training physicians

better equipped to work in the integrated healthcare teams that contemporary society demands, ensuring higher quality and more humane healthcare.

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