

Changes in the Assessment of Interprofessional Collaboration on Chronic Care: Insights from an Interdisciplinary Healthcare Seminar

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Abstract

This paper presents the development and evaluation of an interdisciplinary seminar on Chronic Care. The seminar brings together students from medicine, dentistry, psychology, nursing science, economics, and management to explore the complex challenges of caring for people with chronic diseases. Grounded in the Chronic Care approach and recommendations by the German Science Council, the course addresses the need for interprofessional collaboration and transdisciplinary learning, which are still rarely implemented in primary academic qualifications. The seminar's objective is to help students understand the interconnections between disease progression curves, care needs, and resilience, while reflecting on their own disciplinary roles through dialogue and shared learning. Content includes the subjective experience of disease, social determinants of health, disease progression curves, person-centered care, and resilience theory. Using discursive, practice-oriented teaching methods, the seminar fosters critical reflection on professional identities and collaboration. To assess changes in students' attitudes toward cross-professional cooperation, a pre-post survey using a 5-point Likert scale was conducted. Results indicate that students developed a clearer understanding of their own roles and an increased appreciation for interprofessional exchange. The evaluation suggests that such interdisciplinary formats are essential for preparing future professionals to meet the demands of chronic care in real-world settings.

Keywords

Chronic Care, Interprofessional Collaboration, Higher Education, Interdisciplinary Learning

1. Introduction

The aim of this paper is to present changes in students' perceptions of interdisciplinary collaboration, using the example of chronic care. Chronic care represents an interdisciplinary approach to the management of chronic diseases, encompassing collaboration across professional disciplines, healthcare institutions, and sectors (Fiedler et al., 2024). Kongkar et al. (2025) point out that interdisciplinary care can have positive impacts on the outcomes of people with chronic diseases e.g. from the patient's perspective, chronic care fosters greater autonomy in managing health and leads to improved clinical outcomes. On the level of provider-patient interaction, it enhances the effectiveness of healthcare professionals and encourages collaborative decision-making. Within healthcare organizations, it promotes more efficient service delivery and resource use. To acquire the competencies required for interprofessional collaboration, students need to engage in suitable learning experiences as part of their academic education (Kaap-Fröhlich et al., 2022).

Collasius (2023) developed a questionnaire to evaluate interprofessional collaboration, which we modified to suit the context of the interdisciplinary seminar on chronic care, described in the methods section. The objective of the questionnaire was to distinguish between multiprofessional, interprofessional, and transprofessional forms of collaboration. The differences between these terms are inconsistently defined in the literature. Mahler et al. (2014) attempt to establish a distinction, defining "multiprofessional" as the involvement of multiple professional groups who collaborate in a selective, topic- or case-specific manner. In contrast, interprofessional collaboration is characterized by its sustained nature and structured, rule-based interactions, commonly occurring within the framework of a single institution. Moreover, transprofessional collaboration entails the continuous transcending of professional competencies and responsibilities, with participants flexibly crossing and partially redefining their role boundaries through reciprocal interaction. It is the most complex form of cross-professional cooperation (Frenk et al., 2010; Collasius, 2023). This focus was also chosen in the questionnaire by Collasius to encourage reflection on collaboration beyond disciplinary boundaries, which is increasingly relevant in complex chronic care settings.

Thylefors et al. (2005) investigated team efficiency and climate among healthcare professions based on team type, surveying 59 teams (337 respondents). They found that teams with greater interdependence and closer collaboration, particularly transprofessional teams, characterized by flexible role boundaries and self-regulated leadership, demonstrated higher efficiency and better team climate regardless of profession or organization. The authors conclude with a call to "strive for transprofessional teamwork", emphasizing the need for time resources, coordinated schedules, and social competencies to support this intensive collaboration. The appropriate degree of collaboration for the care of patients with chronic diseases must be negotiated on a situational basis, in accordance with the specific care mandate and objectives. To familiarize students with the different forms of

collaboration and their appropriate application, the seminar on chronic care addresses the fundamentals of living with chronic diseases from the perspective of those affected.

The seminar “Chronic Care” takes place within the interdisciplinary elective curriculum Studium Fundamentale (StuFu). The StuFu at Witten/Herdecke University is aimed at students from various degree programs who deal with socially relevant problems in seminars. For the past five semesters, our teacher team has been offering the interdisciplinary seminar “Chronic Care”, which deals with the challenges of cross-professional care for people with chronic diseases. In line with the Chronic Care approach, the German Science Council recommends in its reports on the further development of medical studies (2018) and healthcare courses (2023) that transdisciplinary approaches, interprofessional collaboration and patient-centered care in everyday practice should be pursued during the course of study. Multidisciplinary and interprofessional forms of teaching and learning are rarely integrated into the curriculum, particularly in primary qualifications.

At the current state of research, only isolated studies on Chronic Care and interdisciplinary learning were conducted, e.g. interviews with people with chronic diseases in a public health degree program (University of Bremen, 2022) or inter-professional collaboration during studies (Mayer et al., 2014). A cross-professional and cross-departmental seminar concept from study programs that are not only health-related, does not yet exist for Chronic Care.

The learning objective of the Chronic Care seminar is to demonstrate the connections between the course of diseases, care requirements, and resilience factors. Furthermore, through a discursive process, the comparison of perspectives between the various disciplines and professional groups involved, on the one hand, and their involvement with those affected, on the other hand, is demonstrated. The following question should be answered by the research on this seminar: How does the discussion of the interdisciplinary seminar content on Chronic Care change the assessment of cross-professional cooperation?

2. Materials and Methods

2.1. Methodological-Didactic Concept

An interdisciplinary seminar with regard to the group of learners on the topic chronic care has been developed that takes a cross-setting and multi-perspective approach to the field of care for people with chronic diseases. Chronic care involves a transdisciplinary approach on a content level. In the seminar, theories and concepts from various disciplines—including social work, social sciences, and nursing science—are discussed. The seminar focuses on care processes from the perspective of the person affected. In more in-depth group work phases, aspects of care-providing organizations, transitions between organizations, and broader societal framework conditions are also discussed. Finally, the discursive teaching-learning process is intended to reflect on the students’ own disciplinary connectivity with regard to the highly complex field of practice. Following the introduc-

tion to the topic of chronic care, the seminar content focuses on the subjective experience of chronic diseases (Egger, 2005) and the social determinants of health (Hurrelmann & Richter, 2022) as well as the disease progression curves (Corbin, 1994) and trajectory work (Höhmman, 2007). In addition, the course focuses on person-centered care (in the context of the family) (Epstein & Street Jr, 2011; Patterson & Garwick, 1994) with a subsequent focus on resilience and protective factors (Antonovsky, 1979; Faltermaier, 2023).

The learning objective of the seminar was defined as enabling students to understand key theoretical approaches and concepts related to the care of people with chronic diseases and to reflect on them in the context of their future professional practice; additionally, through exchange with others, they should experience the diversity of perspectives on the phenomenon of chronic diseases. Learning and teaching methods are primarily aimed at discussion and reflection rounds in which theoretical content is dealt with using practical examples in a cross-professional context, exchanging experiences, and deepening understanding in small groups.

The learning group eligible to enroll in the course consists of up to 25 students and is open for students from all study programs as human medicine, dentistry, psychology, nursing science, economics and management courses. Participation in this accompanying research was voluntary for the students. The enrolled students received an information sheet outlining the aims, points of data collection, and purposes of the research, as well as a consent form to provide their written consent.

2.2. Research Design

To be able to collect data in a standardized and anonymized manner, a questionnaire was chosen. Measuring the changes of the assessment of cross-professional cooperation two points of data collection were defined: first the beginning of the seminar before the learners came into contact with the first content-related topics (t1) and at the end of the seminar after engaging with all the content and achieving the learning objectives (t2). The quantitative questionnaire was based on the assessments of the form of collaboration mono-, multi-, inter- and transprofessionality (Collasius, 2023). Collasius developed her questionnaire for professions in professional practice without measuring validity. The items were linguistically adapted for the context of students in higher education. The suitability of the questionnaire lay in the clarification of the terms of grades of collaboration. The validity of the questionnaire was not tested, as the original version on which it is based had likewise not undergone a validation process. The adapted version retained the structure and content of the original instrument, allowing for the assumption of content equivalence. A separate validation study was therefore not included within the scope of this project.

The items were sorted to four groups in the questionnaire to be rated by the students before and after attending the seminar:

- A. Collaboration within one's own professional = collaborating and seeking support from colleagues within own professional group regarding patient care:
- I discuss patients with others in my professional group.
 - If I encounter problems, I seek help from colleagues in my professional group.
- B. Interprofessional collaboration = engaging in interprofessional collaboration by actively exchanging information with other professional groups, coordinating actions and workflows, sharing information about own activities, and recognizing that effective cooperation requires the commitment of all involved:
- I exchange information about patients with other professional groups.
 - Cooperation with other professional groups requires the commitment of each individual.
 - I keep the professional groups with whom I work directly informed about my actions.
 - I coordinate my work behavior and work processes with members of other professional groups.
- C. Organization of collaboration = participating in structured interprofessional collaboration, where roles may overlap, patients are regularly discussed in team meetings, cooperation is actively promoted, and clear agreements and shared goals are defined jointly by all involved professional groups to ensure coordinated patient care;
- When I talk to other professional groups, there are overlaps in our areas of activity. Patients are regularly discussed in interdisciplinary team meetings.
 - Cooperation with other professional groups is specifically encouraged.
 - When there is an exchange between different professional groups, the goal of care is defined jointly.
 - Patient care requires clear rules and agreements between the professional groups involved.
 - All professional groups involved agree on a common goal.
- D. Professional role = collaboratively addressing problems across professional groups, with all care-related tasks being carried out jointly and on an equal footing by the involved professions;
- Problems are defined independently of professional groups and attempts are made to solve them.
 - All care-related tasks are performed jointly and equally by the professional groups involved.

The implementation and evaluation of the seminar was integrated surveyed by using this questionnaire. A 5-point Likert scale from 5 = "strongly agree" to 1 = "strongly disagree" was used for the response behavior. The survey was conducted in the winter semester 2024/2025. The students (t1; n = 11/response rate t2; n = 6) were informed about the survey and gave their informed consent. The data from t1 and t2 were matched by an individual participant code that was created with special letters from their mothers' and fathers' names and place and date of birth. The teaching team then statistically analyzed the data by comparing the

means with t-tests.

3. Results

3.1. General Results of the Study Participants

The study participants were characterised by the following aspects: According to the results from t1, six students (54.5%) were from the field of human medicine, four students (36.4%) from psychology and one student (9.1%) from the dental medicine programme. The students had a wide range of previous professional experience; some had already completed vocational training in the field of healthcare and paediatric nursing, while other students mainly had experience in the form of internships or a voluntary social year. In addition, eight (72.8%) out of eleven students enrolled in the seminar due to a fundamental interest in the subject. The main expectations of the seminar were to gain individual insights into the practical field of chronic care and to familiarise themselves with the perspective of those affected.

3.2. Content-Related Results According to the Subcategories Presented between T1 and T2

The results of the surveys between start of the seminar (t1) and end of the seminar (t2) can be analysed in detail according to the 14 items in the subcategories (see **Figure 1(a)**, **Figure 1(b)**). These 14 subcategories are assigned to the different four main categories (cooperation within the professional groups; perspective on interprofessional cooperation, perspective on organisational framework conditions and perspective on role expectations).

The fact that the submitting students were coded made it possible to differentiate between the group of students that responded in t1 and t2 (hereinafter referred to as G1) and the group that only responded in t1 (hereinafter referred to as G2) in view of the reduced response rate of 55% in t2. In fact, it was found that G1 and G2 differed significantly with regard to their assessments at t1.

In t1 G1 compared with G2 showed moderately (≤ -0.2 , to < -0.5) to significantly lower (≥ -0.5) approval ratings in ten categories. In only one category a moderately higher approval rating (≥ 0.2 , to < 0.5) could be found. In three categories, agreement have been found equal (< -0.2 to < 0.2).

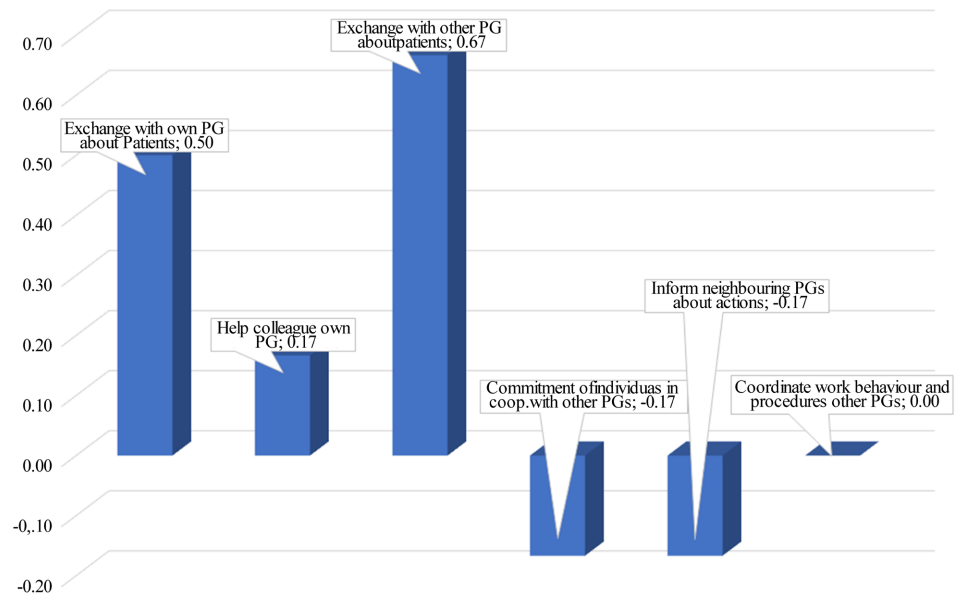
These differences in approval ratings did adjust in t2 only in a few items. Henceforth, G1 showed moderately to distinctly lower approval ratings in 7 categories compared to the ratings of G2, whilst in two items approval ratings were moderately or distinctly higher compared to G2.

This led to the assumption that the group of students who participated in both inquiries are quite different from those who did not. Therefore, we analysed the dataset of the survey in two different ways. We compared the deviation of mean value from t2 to t1 first using all data of t1 (G1 and G2), second only with the assessment made by G1.

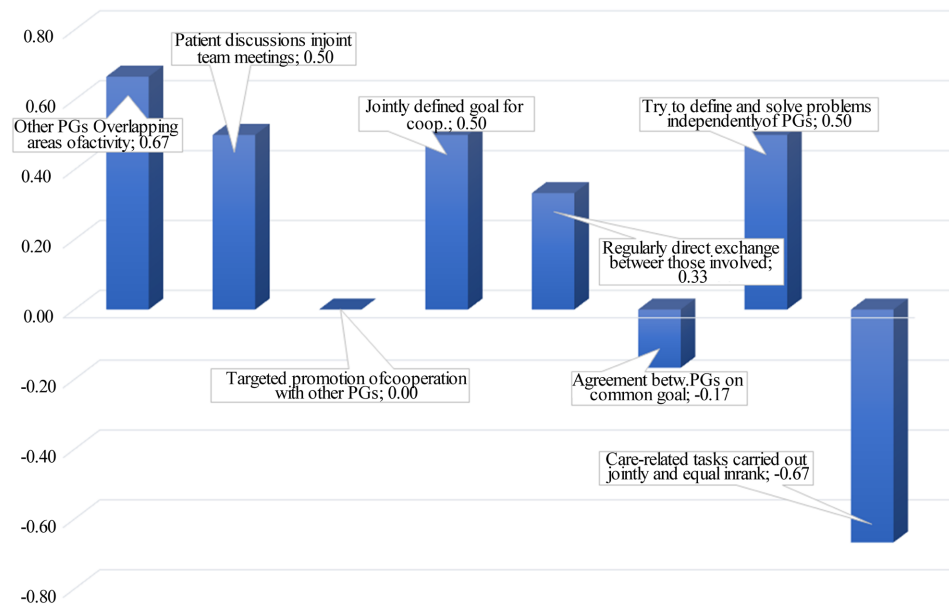
The deviation between t2 and t1 all students just showed significant results in

only two items. It can be shown that due to the distinct differences between G1 and G2 and the non-participation of G2 these results are systematically distorted.

Therefore, we analyzed the changes between t1 and t2 only within G1. It can be found that approvals increased moderately or distinctly in seven categories. Relatively unchanged approvals showed six categories. In one category, on the other hand, there was a distinct decrease in agreement. This category was “Treatment-related tasks are performed in a professionally equal and non-hierarchical manor”.



(a)



(b)

PG = Professional Group.

Figure 1. (a) + (b) Change in approval ratings G1 from t1 to t2 all categories.

A comparison of the changes between t1 and t2 (see [Table A1](#)) reveals fundamental differences in the main categories. It can be seen, for example, that intraprofessional collaboration experienced an overall increase in approval, whereas the perspectives on interprofessional collaboration had changed little overall, but the exchange about patients had gained significantly in approval (+0.67). The assessment of the organisation of collaboration received comparatively low approval ratings in t1. However, the changes in the approval ratings in t2 were moderately higher overall in all associated individual categories. However, there were clear differences between the individual categories (see [Table A2](#)). For example, the assessment of the overlap between fields of activity increased significantly. The organisation of interprofessional team meetings and the joint agreement of common goals in care also received significantly more approval.

The understanding of roles developed in contradictory ways. For example, the joint definition of problem definition and solution received significantly higher approval (+0.5), but approval of the joint and equal implementation of care tasks decreased even more (−0.67).

4. Discussion

In the Chronic Care seminar, the study endeavours to present the changes in the perception of interdisciplinary and cross-professional cooperation from the perspective of students on the topic of caring for people with chronic diseases. The topic of chronic care is of particular importance because, based on the interdisciplinary perspectives in the treatment of people with chronic diseases, interprofessional cooperation between different specialist disciplines and sectors in healthcare is necessary from the very beginning of care in order to ensure comprehensive and person-centred care ([Fiedler et al., 2024](#)).

With some evidence it can be assumed that the seminar with students from different specialist disciplines and the examination of the complex subject content of chronic care led to a higher level of approval for intra- and interprofessional collaboration overall. This result supports the recommendations of the German Council of Science and Humanities in its reports on the further development of medical studies (2018) and healthcare degree programmes (2023), which call for the promotion of interprofessional collaboration during the degree programme through inter- and transdisciplinary teaching and learning concepts to prepare students for everyday working life in healthcare practice. The results of the present study support the views of [Kaap-Fröhlich et al. \(2022\)](#) that competences of interprofessional collaboration should be acquired through specific learning experiences already in the context of academic education.

The already high approval ratings in t1 for the topics of intra- and interprofessionalism indicate an existing understanding of the interdisciplinary approach and practical-conceptual solution to issues relating to the care of people with chronic diseases. Since G2 already showed particularly high approval ratings in t1, but did

not participate further in the course of the study, it must be questioned whether this specifically high approval was part of the motivation for participating in the seminar, but at the same time reduced the motivation for participating in the study, because a change in attitude may not have occurred in this group, or only to a small extent.

Nevertheless, it is surprising, that this group of students on the one hand had some certain personal preferences, which differ them from G1, and on the other hand for unknown reasons have been uninterested in finishing the survey. In t1 every student was asked for personal or professional characteristics and experiences before studying. Neither special interests in the field of chronic care nor exceptional personal or professional characteristics could be identified. In future survey these aspects should be addressed.

In comparison, the significantly lower approval ratings of G1 compared to G2 may indicate a different motivational situation of the student groups, in the form that G1 was more sceptical about the understanding of interprofessionalism at the beginning. This scepticism could also mean a greater sensitivity towards the topic of chronic care and interprofessionalism and a higher motivation to participate in the seminar and the study.

What was striking about the results was the significant reduction in agreement in the category of equal-ranking joint problem solving with a simultaneous increase in the importance of defining and solving problems independently of professions and disciplines. On the one hand, this shows once again the importance of interprofessional communication and problem perception, which were supported by the seminar. On the other hand, it shows that the seminar sharpened the role perceptions and activity profiles of oneself. Obviously other aspects of interprofessional collaboration have become more important, such as organisational regulations and interprofessional agreements in the forefield of professional action. Furthermore, it gives some evidence that dealing with questions of interprofessionalism und interdisciplinarity is not supporting role distortion but can lead to more professional clarity. These aspects should be more focused in further surveys.

In the initial assessment, G1 showed a comparatively low level of agreement with the organisational conditions for interprofessional collaboration. This main category experienced a moderate increase in agreement overall. However, individual categories such as the organisation of interprofessional team meetings, the clarification of overlapping areas of activity and the definition of common patient-related care goals showed a significant increase in agreement. With reference to the high importance of intra- and interprofessional cooperation at the beginning of the seminar, this indicates that awareness of the importance of organisational conditions has increased over the course of the seminar.

In conclusion, the present study confirms, based on the subjective assessments of the students, the usefulness of a seminar concept in the study programme on interprofessional collaboration in the field of chronic care.

5. Conclusion

Overall, the study shows that the topic of chronic care in the seminar form conducted is suitable for developing an understanding of both the greater practical and scientific complexity. The limitations of the study are related to the small sample size, the specific context, and the possible influence of the researchers, as they were also the teachers in the seminar. However, there are still open questions that should be better addressed by adapting future studies. For example, the differences between individual attitudes towards interprofessional collaboration and individual assessments of experienced practice in the field of interprofessional care in chronic care sometimes remain unclear. In this respect, the question arises as to what the change in assessments of interprofessionality refers to, namely to changing attitudes as such, or to showing students options for action for interprofessional practice if they are motivated to do so.

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Institutional Review Board Statement

Not applicable. Participants were informed orally at the beginning of the webinar of the aims and objectives of the study. This article does not contain any studies on human participants performed by any of the authors. Written consent was not required as part of the further development and research into the impact of university teaching.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

The data presented in this study are available on request from the corresponding author, as they contain sensitive content that could be misunderstood or misused if published openly.

Abbreviations

The following abbreviations are used in this manuscript:

PG	Professional Group
MD	Deviation Mean Value
t1	Inquiry start of seminar
t2	Inquiry end of seminar
G1	Students finishing inquiry
G2	Students only responded in t1

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Conflicts of Interest

The authors declare no conflicts of interest.

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Appendix A

Table A1. Results change of personal assessments (MD) and comparison values G1 and G2.

Item	MD t2 to t1 all data	MD Data only G1	Comparison MD G1 in t2 with G2	Comparison MD G1 in t1 with G2
Exchange with own PG about patients	-0.03	0.5	-0.67	-1.17
Help of colleagues own PG	0.06	0.17	-0.07	-0.23
Exchange with other PG about patients	0.17	0.67	-0.43	-1.10
Collaboration with other PG depends on personal commitment	-0.14	-0.17	-0.10	0.07
Informing neighbouring PG's about actions	-0.42	-0.17	-0.73	-0.57
Agree professional conduct and procedures with other PG's	-0.15	0	-0.33	-0.33
Other PG's overlapping fields of activity	0.32	0.67	-0.10	-0.77
Discussing patients in interprofessional team meetings	0.61	0.5	0.73	0.23
Targeted promotion of interprofessional collaboration	0.08	0	0.17	0.17
Jointly defined goal when collaborating with other PG	0.38	0.5	0.23	-0.27
Regularly direct communication between involved professions	0.08	0.33	-0.23	-0.57
Participating PG agree on common goal	-0.38	-0.17	-0.63	-0.47
Trying to define and solve problems independently of single PG's perspective	0.23	0.5	-0.10	-0.60
Treatment-related tasks are performed in a professionally equal and non-hierarchical manor.	-0.73	-0.67	-0.80	-0.13

Table A2. T-Test results of inquiry for null hypothesis "No change in personal assessments from t1 to t2".

Item	T ₁ *	T ₂ *	SD	DF	P ₁ **	P ₂ **
Exchange with own PG about patients	-0.35	5.81	0.52	5	0.741	0.002
Help of colleagues own PG	0.70	1.94	0.52	5	0.515	0.11
Exchange with other PG about patients	0.17	5.31	0.75	5	0.241	0.003
Collaboration with other PG depends on personal commitment	-0.98	-1.20	0.84	5	0.372	0.284
Informing neighbouring PG's about actions	-4.93	-1.94	0.52	5	0.004	0.11
Agree professional conduct and procedures with other PG's	-1.76	0.00	0.52	5	0.139	1
Other PG's overlapping fields of activity	3.49	7.30	0.55	5	0.017	0.001
Discussing patients in interprofessional team meetings	2.23	1.84	1.63	5	0.076	0.125
Targeted promotion of interprofessional collaboration	0.39	0.00	1.17	5	0.73	1
Jointly defined goal when collaborating with other PG	1.94	2.57	1.17	5	0.11	0.05
Regularly direct communication between involved professions	1.11	4.90	0.41	5	0.317	0.004
Participating PG agree on common goal	-1.94	-0.86	1.17	5	0.11	0.429
Trying to define and solve problems independently of single PG's perspective	1.63	3.59	0.84	5	0.164	0.016

Continued

Treatment-related tasks are performed in a professionally equal and non-hierarchical manor.	-4.88	-4.47	0.89	5	0.005	0.007
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* T1 = comparison of personal assessment t2 to t1 (all datasets) - T2 = comparison of personal assessment t2 to t1 (only students finishing inquiry)

** P1 = P-value T1 - P2 = P-Value T2
