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A qualitative study on dyad practice in a clinical setting

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ABSTRACT

INTRODUCTION: General practice in Denmark is at risk of experiencing an educational capacity problem in which the quality of medical students' clinical stays is compromised due to reduced tutor capacity. Dyad practice, in which students work and acquire competencies in pairs, is known from simulation and ultrasound training to be as effective with regard to learning outcome as single practice despite reduced hands-on time. This study aimed to explore the experience of dyad practice during a group of medical students' first clinical stay in general practice.

METHODS: A focus group interview was conducted with eight medical students who had attended clinical stays in general practice in four dyads. Individual semi-structured interviews were held with three general practitioners who tutored the medical students during the clinical stays. Data were transcribed by the interviewer and analysed using systematic text condensation.

RESULTS: Both the medical students and general practitioners described how dyad practice enhanced the students' self-reflection and introduced new learning experiences. Furthermore, the medical students experienced shared memory with their peer and a broader overview before, during and after the consultation with the patient.

CONCLUSIONS: Dyad practice was experienced by both medical students and general practitioners as suitable for medical students' first-time clinical stay in general practice. Dyad practice may thus reduce the capacity problems with regard to medical education in general practice.

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TRIAL REGISTRATION: not relevant.

The number of medical students at the Danish medical schools is expanding to meet the increasing pressure on Danish healthcare. An essential part of medical training is clinical stays at hospitals and in general practice in which experienced-based learning and skills training take place. In the clinical setting, supported participation by medical students is a core condition for clinical workplace learning [1]. Unfortunately, rising numbers of medical students, increasing workloads and a healthcare system focusing on patient outcomes and efficacy all add to the risk of an adverse effect on learning in the clinical setting.

Studies on learning from medical simulation have shown that a possible solution to capacity problems in medical education may be to let students work and acquire competencies in pairs (dyads) [2, 3]. Dyad practice is a type of peer-assisted learning that originates from the field of collaborative learning. It has been defined as the acquisition of knowledge and skills through active help and support between matched companions [4]. Dyad

practice was found to be beneficial especially when training complex motor skills [5, 6], and therefore the dyad model has been increasingly used within medical simulation where it was shown to be more efficient and cost-effective than individual training when learning a complex clinical skill [2, 3, 7]. Furthermore, a Danish study found dyad training to be more efficient and effective than individual training when medical students were trained in managing patient encounters prior to their first clinical stay at a hospital [8].

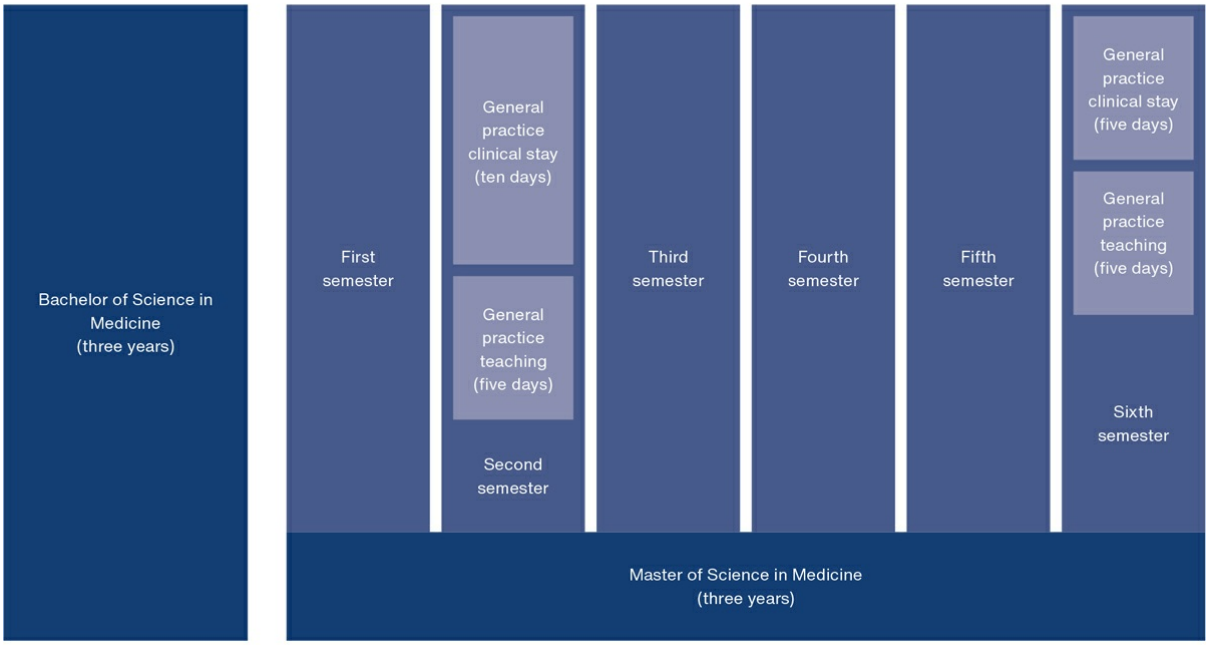
Overall, evidence suggests that the dyad model is suited for simulation and medical skills training, but the literature on dyad training in an authentic clinical context is sparse and still mostly related to the acquisition of technical skills [9]. However, studies have shown that the learning advantage of dyad practice within motor skills learning is primarily owed to observing another learner [10] and that both observational learning and feedback contribute to the enhanced learning outcome produced by dyad practice [11, 12]. Thus, we hypothesise that dyad practice in which peers observe and give each other feedback is feasible and suitable for medical students' clinical stay in general practice. In the present study, we investigated how dyad practice is experienced by both medical students and general practitioners during a first-time clinical stay in general practice.

METHODS

Design, setting and participants

This study was designed as a qualitative pilot study in which a class of eight fourth-year medical students was chosen to engage in dyad practice during a first-time clinical stay in a general practice. The course in family medicine took place over the course of three weeks in the spring/summer of 2020 and consisted of ten days of clinical stay in a general practice and five days of teaching (**Figure 1**). The students were familiar with collaborative learning from their previous curriculum and were divided into pairs with a peer with whom they were used to cooperate. Each of the four dyads was allocated to a general practice that was used to hosting one medical student and had agreed to have two students at a time. Each general practitioner had previously arranged the clinical single-student stays as they saw fit with regard to introduction, observation and supervision of the student in the clinic. Therefore, the instruction given to the general practitioners was to arrange the clinical stay as usual, but to let the students conduct consultations both alone and in pairs. The general practitioners provided the usual tuition to both students independently of type of consultation, meaning that patient safety was not compromised during the study. The medical students were advised to alternate between the functions as the active physician and passive observer, and they were equipped with a written guide on how to conduct collegial supervision both before, during and after the consultation. Additionally, all students had the opportunity to observe the general practitioner's consultations and daily work during the clinical stay.

FIGURE 1 The role of general practice in the local medical school curriculum.



Interviews

At the end of the course, all of the eight medical students agreed to participate in a focus group interview to investigate their experience with dyad practice during their clinical stay in general practice. The focus group interview allowed both peers in every dyad to contribute with their view on the same topic and to interact during the interview [13]. The focus group interview lasted 120 minutes and was conducted by a moderator and an observer. Furthermore, individual semi-structured 30-minute interviews were conducted with three general practitioners. The interviews covered two broad topics for all participants (the patient encounter and learning outcomes) and in addition one specific topic for the medical students (peer-support) and general practitioner (the capacity perspective), respectively. The questions were general and open-ended in order to explore aspects within each topic [13]. We obtained informed consent and participation was voluntary. All participants have been anonymised in the interview data.

Data analysis

The interviewer transcribed the audio-recordings of the interviews to prepare the raw data for qualitative analysis using a systematic text condensation (STC) approach. STC is a method for thematic cross-case analysis of qualitative data commonly used in medical qualitative research owing to its transparency and methodical approach [14]. As explained in **Table 1**, the process may be divided into four steps. An overview of the transcriptions was established and preliminary themes were identified in order to establish a general impression of the experience with dyads in general practice. Data were then reviewed repeatedly in order to identify, classify and sort meaning units potentially related to the previously negotiated themes. This step implied cross-case coding that organised the meaning units into code groups. The meaning units within the code groups were then divided into subgroups representing the thematic contents of the empirical data. This step generated seven codes that were discussed within the research group yielding further condensation into three overall themes. In the final step of STC, condensates and quotations were processed into analytical texts in order to describe the phenomenon of interest; the experience of dyad practice in a clinical setting.

Trial registration: not relevant.

TABLE 1 Analytical steps of systematic text condensation [14] and the contribution to the process from the research group.

Analytical step no.	subject	Analytical process	Analysis performed by
1	Total impression	Overview of data Identifying preliminary themes during reading of transcription Discussion of preliminary themes within the research group	SG
2	Identifying and sorting meaning units	Systematic review of the transcript Identifying, classifying and sorting meaning units Decontextualisation by cross-case coding	SG and CHM
3	Condensation	Sorting the meaning units into thematic code groups Discussing, renaming and redefining codes within the research group	SG, CHM and JKK
4	Synthesising	Reconceptualising the data Construction of analytical texts reflecting the validity and wholeness of their original context	SG

RESULTS

Impact of dyad practice on the individual level

The medical students had a positive experience of being a part of a dyad both when they were conducting a consultation with a patient as the physician and when observing their peer. The students generally agreed that it felt very safe to attend the clinical stay with a peer and that this feeling of comfort influenced how they experienced the patient consultation as a physician.

It [the comfort, ed.] means a lot, it also means that you have a broader overview. ... Yes, that you can think a little wide, when you feel comfortable in the situation. (Medical student A)

An essential part of the dyad model is that both the medical student serving as the physician and the observer have prepared for the same patient, often in collaboration. This enhanced the feeling of safety, comfort and broader overview during the consultation. The students recognised this feeling both when the observer contributed during the consultation and when the peer was just observing.

If there were things that you did not ask about then there was another person who quickly [could add, ed.]... Because we had prepared ourselves and we had prepared for the same patient. (Medical student D)

When you are going to try new things, I, especially, can be a little insecure. Then it is very reassuring to have one [by your side, red.]. Especially when you know the person ... Then you have a backup, without him having to say anything after all. (Medical student C)

Generally, this sharing of knowledge and memory within the dyad both before, during and after the consultation was experienced as beneficial to the medical students, which was also noted by the general practitioners.

... they are at the same level so they can complement each other with their questions, with their "How do we do this?" (General practitioner A)

Peer learning enhances self-reflection

The next theme identified was peer learning and how observing another student facilitated self-reflection and personal development of their own role as a physician. One student explained:

It has triggered self-reflection about which sort of physician I would like to be when I graduate. (Medical student E)

Another student added:

I think that you learn many good techniques when you are observing, like: "that was a good way of asking". It is always easier to be an observer and find those... good things and find those ... failures, so in that way, it is suited for reflection. Both for the feedback, but also as to what you could do yourself the next time. (Medical student A)

Gaining inspiration from each other on how to be a physician and how to use the acquired skills was described by the participants as a substantial benefit from the dyad constellation. In general, it was agreed that observing an equal peer made the medical students develop their own personal identity and professional role rather than imitating the experienced practitioner. This was also the perception of the general practitioners:

I also think it is good for the students actually, to observe each other, because I believe they can learn a lot from each other that does not necessarily need to be taught by the general practitioner. (General practitioner A)

Learning experiences

The final theme resulting from the analytical process exemplified in **Table 2** was learning experiences owing to dyad practice. These experiences occurred both before, during and after the consultation when the medical student interacted with a peer. Prior to the consultation, the students prepared for the given case or patient by sharing and discussing their considerations with each other. The opportunity for the students to engage in sparing with a peer before the consultation was also experienced positively by the general practitioners:

TABLE 2 An example from the qualitative data analysis.

Step no.	subject	Examples from results
1	Total impression	The medical students described how they asked the observer if they had remembered and done all steps in the examinations of the musculoskeletal system correctly The resulting preliminary theme was: "The consultation as a learning space"
2	Identifying and sorting meaning units	A meaning unit from interviews with both medical students and general practitioners was: Medical students ask and include the observer during examinations of the musculoskeletal system to ensure that it is performed correctly during the patient consultation
3	Condensation	The meaning unit above was condensed into the theme code: "learning spaces during the patient consultation" In total, 7 themes codes emerged: Learning spaces Peer support Role of the observer Responsibility and independence of the medical students Role of the general practitioner Interaction between the medical students and the personnel Collaboration before and after the patient encounter
4	Synthesising	New learning spaces were found to emerge not only together with the patient as with technical skills training but also before and after the patient encounter Therefore, "Learning experiences" was the 1 of 3 overall themes: Impact of dyad practice on the individual level Learning experiences Peer learning
		The transcripts were then re-read to ensure correct interpretation and understanding[a]

a) See "Results" for analytical texts and quotations.

Well, when they sat – which I also think is very nice – before and read up on the topic that was relevant for the next patient, and presumably talked about the topic, it was actually really nice, because some was taken away from me. They took a little more care of themselves you might say? (General practitioner B)

After the consultation, the observer provided feedback to the peer, both immediately and subsequently. The medical students experienced that having their clinical stay in the same setting at the same time underpinned learning and reflection on both the consultations that they did and did not observe because they could share their experiences with their peer afterwards.

That process of reflection has worked well for me. To talk about it on the way home...there was half an hour to

settle down, and let out your thoughts about having that patient and how we examined at that exact moment and what we chose to do and such things. I learned a lot that way, too, by reflecting about what the other one had experienced. (Medical student F)

DISCUSSION

One of our main findings was that the students experienced a sharing of memory and knowledge when working with a peer. This provided them with a sense of comfort that allowed them to adopt a broader view and facilitated reflection. A united memory and sharing of knowledge were described to decrease the cognitive load, which, in turn, has an impact on learning which has been explained by cognitive-load theory in the field of psychological research [15].

We also found that the students experienced that observing a peer was rewarding with regard to reflection on their own personal identity as a physician. This is consistent with findings in the literature, where reflections on role modelling and the search for a professional role have been described as a pivotal part of the learning experience when medical students attend clinical stays in general practice [16]. Thus, reflective observation is an acknowledged and recommended learning method known from the ambulatory clinical educational setting [17]. In the literature, it was questioned whether the possible outcomes from dyad practice depend on the learner's experience level [12, 18]. Furthermore, learning was also described to be affected by shifts in cognitive load due to the complexity of the task [19], the abilities focused on and the familiarity of the students in the dyad [20]. Thus, in our study, the medical student's experience of dyad practice might be positively biased by the fact that they were working closely together with a peer whom they knew well and felt safe working with.

The strengths of the study include that it provides in-depth insight into how dyad practice in a clinical setting is experienced and that the participating general practitioners have several years of experience with clinical stays for one student. The study is limited by being a small pilot study that did not evaluate the learning outcome of dyad practice in the clinical setting. However, our findings indicate that both medical students and general practitioners experienced general practice as an appropriate clinical setting for dyad practice. Future research is warranted to investigate the learning outcome of dyad practice and establish how the composition and experience of the dyad affect the learning experience.

CONCLUSIONS

Our findings suggest that dyad practice is both feasible and suitable for medical students' first clinical stay in general practice. Using dyad practice during medical students' clinical stays may potentially contribute to maintaining the amount of clinical training in general practice despite the rising numbers of medical students.

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