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RESEARCH ARTICLE

Candid insights and overlooked facets: what medical students write about patient-centeredness in diaries on longitudinal patient contacts

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ABSTRACT

Despite students' exposure to patient-centered care principles, their dedication to patient-centeredness often experiences a wane throughout their academic journey. The process of learning patient-centeredness is complex and not yet fully understood. Therefore, in our study, we sought to explore what aspects of patient-centeredness students spontaneously document in their diaries during interactions with actual patients. This investigation will help to identify gaps in the current educational practices and better prepare future clinicians to deliver patient-centered healthcare. We analyzed 92 diaries of 28 third-year undergraduate medical students at UMC Utrecht in the Netherlands who participated in an educational intervention, following four patients each as companions over a two-year period early in their clerkships. We conducted thematic analysis, using inductive and deductive coding, within a social-constructionist paradigm. We identified four key themes: communication, the person behind the patient, collaboration and organization in healthcare, and students' professional development. Within these themes, we observed that students spontaneously documented 9 of 15 dimensions of patient-centeredness as outlined in the model of Scholl: 'clinician-patient communication', 'patient as unique person', 'biopsychological perspective', 'essential characteristics of the clinician', 'clinician-patient relationship', 'involvement of family and friends', 'patient-information', 'emotional support' and 'coordination and continuity of care' (mainly *principles* of patient-centeredness). Conversely, we noted that students underreported six other dimensions (*enablers and activities*): 'access to care', 'integration of medical and non-medical care', 'teamwork and teambuilding', 'patient involvement in care', 'patient empowerment' and 'physical support'. Throughout their longitudinal journey of following patients as non-medical companions, students spontaneously documented some aspects of patient-centeredness in their diaries. Additionally, students reflected on their own professional development. Our findings suggest that incorporating education on the broadness of the concept of patient-centeredness coupled with enhanced guidance, could potentially enable students to learn about the complete spectrum of patient-centeredness within their medical education.

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Background

Educators have long been dedicated to designing medical education programs with the aim of fostering patient-centeredness, while researchers have sought to determine the most effective educational approaches in this regard [1,2]. Despite these efforts, the existing literature consistently reveals a concerning trend: the patient-centered attitude of medical students tends to decline over the course of studies [3,4]. However, the fundamental principle remains unaltered: every patient deserves a doctor who perceives them as a unique individual, with their own interests and wishes, norms and values, and who takes these into consideration when providing medical care. Therefore, in

contemporary medicine, the demand for healthcare providers who deliver truly patient-centered care is paramount [5–10]. Meeting this standard requires a concerted effort to better prepare future clinicians for the critical task of providing patient-centered care. In the light of this challenge, we argue that gaining insight into what students spontaneously learn during their early patient contact will help to identify gaps in the current preparation of future clinicians to deliver patient-centered healthcare allowing for targeted interventions and refinements in medical education programs.

To define patient-centeredness in our study, we used a model by Scholl et al. [11] that defines 15 different

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dimensions of patient-centeredness. Although there are various definitions of patient-centeredness [11–14], in our opinion, Scholl's model offers the most comprehensive representation of the concept derived from a systematic literature review. The model provides a broad insight into all the aspects of patient-centeredness that students can learn about. Firstly, the underlying *principles* of patient-centeredness are described, aspects of the clinician, the patient and their relation. These include elements such as 'clinician-patient communication', 'patient-clinician relationship', 'bio-psychosocial perspective', 'clinician characteristics' and 'patient as a unique person'. The model also demonstrates six concrete *activities* related to patient-centeredness, including 'patient-information', 'patient empowerment', 'patient involvement in care', 'physical support', 'involvement of friends and family' and 'emotional support'. Lastly, the model highlights four *enablers* of care: 'coordination and continuity of care', 'teamwork and teambuilding', 'access to care' and 'integration of medical and non-medical care'. Table 1 shows the dimensions of patient-centeredness according to Scholl et. al [11]. and a description of each dimension. The model can be used as a framework in the development of medical education [15].

It is known from literature that various interventions aimed at promoting patient-centeredness in healthcare education have been effective. For instance, educational interventions with longitudinal patient contacts have proven valuable in equipping students with a deep understanding of certain aspects of patient-centeredness, such as the uniqueness of each patient, the importance of adopting the patient's perspective, and the impact of diseases on individuals' lives [16–19]. Consequently, students exposed to these programs develop more profound awareness

of the social determinants of illness and recovery, acquire more patient-centered communication skills, demonstrate increased commitment to patients, and experience professional growth [16–19]. All these outcomes are related to patient-centeredness. Notably, these positive effects appear to persist over time [20].

Another widely adopted and proven method to foster patient-centeredness in medical education is the integration of educational interventions with real patients. Patient involvement facilitates a better understanding of illness from the patient's perspective, fosters recognition of each patient as a unique person, cultivates empathy, enhances patient-clinician communication, and deepens comprehension of patient-centered care [1,21–24]. On the other hand, it is important to acknowledge that some literature suggests limited evidence for long term effectiveness of patient-involvement in educational interventions [25].

In summary, existing research indicates that students learn about patient-centeredness through different educational interventions [16–24]. However, we also know that despite these efforts, there is evidence of a decline in students' patient-centered attitude as they progress through their studies [3,4]. Patient-centeredness is a multifaceted concept with numerous dimensions to explore [11,12,26]. Considering the breadth of this concept and the current difficulties in maintaining a patient-centered attitude, it seems difficult to encompass the concept of patient-centeredness.

Dimensions of patient-centeredness

In this study, we would like to contribute to the existing knowledge about how students learn about

Table 1. Dimensions of patient-centeredness according to Scholl et. al. (2014).

Dimension	Brief description
Principles	
Essential characteristics of the clinician	A set of attitudes towards the patient (e.g., empathy, respect, honesty) and oneself (self-reflectiveness) as well as medical competency
Clinician-patient relationship	A partnership with the patient that is characterized by trust and caring
Patient as a unique person	Recognition of each patient's uniqueness (individual needs, preferences, values, feelings, beliefs, concerns and ideas, and expectations)
Biopsychosocial perspective	Recognition of the patient as a whole person in his or her biological, psychological, and social context
Enablers	
Clinician-patient communication	A set of verbal and nonverbal communication skills
Integration of medical and non-medical care	Recognition and integration of non-medical aspects of care (e.g., patient support services) into health care services
Teamwork and teambuilding	Recognition of the importance of effective teams characterized by a set of qualities (e.g., respect, trust, shared responsibilities, values, and visions) and facilitation of the development of such teams
Access to care	Facilitation of timely access to healthcare that is tailored to the patient (e.g., decentralized services)
Coordination and continuity of care	Facilitation of healthcare that is well coordinated (e.g., regarding follow-up arrangements) and allows continuity (e.g., a well-working transition of care from inpatient to outpatient)
Activities	
Patient information	Provision of tailored information while taking into account the patient's information needs and preferences
Patient involvement in care	Active involvement of and collaboration with the patient regarding decisions related to the patient's health while taking into account the patient's preference for involvement
Involvement of family and friends	Active involvement of and support for the patient's relatives and friends to the degree that the patient prefers
Patient empowerment	Recognition and active support of the patient's ability and responsibility to self-manage his or her disease
Physical support	A set of behaviour that ensures physical support for the patient (e.g., pain management, assistance with daily living needs)
Emotional support	Recognition of the patient's emotional state and a set of behaviour that ensures emotional support for the patient

patient-centeredness. More specifically, our focus is on what students spontaneously write about the dimensions of patient-centeredness during a longitudinal educational intervention involving real patients, without being prompted to do so. By gaining insights into what students spontaneously document about patient-centeredness and identifying what is outside of their scope during patient interactions, educators can leverage this knowledge when designing future educational interventions. We analyzed diaries that students kept during a two-year longitudinal educational intervention in which they followed four real patients. Through this analysis, we seek to answer our main research question:

What do medical students write about patient-centeredness in diaries while longitudinally following patients in the role of companion?

Methods

Educational background

In the Netherlands, the medical curriculum (leading to an MD degree) spans a total of 6 years: 3 years bachelor and 3 years master. The clerkships typically start either at the end of the third or at the beginning of the fourth year. During these clerkships, students rotate in an often block-based manner through different departments inside and partly outside the hospital. In 2015, the University Medical Center Utrecht introduced a change and transitioned from the conventional block-based clerkship structure to a more integrated model comprising five clerkships. Within these integrated clerkships, a longitudinal educational intervention was designed and implemented to enhance patient-centeredness and collaboration in healthcare.

Intervention

The intervention spanned two years and started at the end of the third year, during the initial integrated clerkship 'General Medicine'. It continued in parallel with subsequent integrated clerkships. During this 2-year period, a pilot group of 35 students each followed four patients. Although the primary goal of this intervention was to foster patient-centeredness, students were not explicitly informed about this objective. This choice was made to prevent students from formulating socially desirable answers in their assignments, aimed at aspects of patient-centeredness. We wanted to capture their own ideas and 'words'. Instead, students were told that this was their chance to gain comprehensive insights into patients' health and illness experiences, witness the entire spectrum of the care process, and establish meaningful patient relationships, which

will be helpful in their development as future clinician. Since we wanted to foster deep identification with the patient's perspective, and not naturally with that of the doctor, we gave students the role of 'companion to the patient on their medical journey', a role that deliberately excluded any medical responsibilities. Moreover, we believed that a medical role would erode students' ability to experience and understand the patient's context from the perspective of the patients.

In collaboration with their supervising General Practitioner, each student selected four patients with different characteristics from the general practice's population: a chronic patient, a pregnant woman or young family, a frail elderly patient and a patient recently diagnosed with cancer. The students met their designated patients in various settings, including the General Practitioner's practice, the patients' homes, and, if feasible, they accompanied the patients to hospital appointments. The underlying assumption was that this multifaceted role would contribute significantly to learning patient-centeredness. The General Practitioner mentored the student during the entire period of two years. In addition to various assignments the students had to complete during these two years, they had to keep written diaries for each of the four patients. These diaries served as a platform for documenting their experiences with each patient and reflecting on contacts with the four patients. For this study, we focused our analysis on these diaries.

Participants

From the pool of 300 students in the third year of the study, 35 students were randomly invited by e-mail and all 35 of them voluntarily participated in this pilot study. The gender distribution (30% male/70% female) closely mirrored that of the medical school. Students were informed about the content of the intervention (following the patients, making assignments and taking part in research) and via an informed consent they agreed to participate in all parts. Throughout the course of the study, 20% of the students withdrew from the intervention and some students did not hand in (all of their) diaries. Although we have little information about reasons for their withdrawal and the missing diaries, we know that students' study-delay and patients' reconsideration to participate played a role. As a result, the intervention was successfully completed by 28 students, who handed in 92 diaries.

Data analysis

All diaries were anonymized by a research administrator. To conduct our analysis, we adopted a social

constructivist perspective [27], and we used thematic analysis [28] to analyze 92 diaries of 28 students. The software program Atlas.ti-9 was used for coding [29].

Firstly, two researchers (MT, CGC) coded the written diaries inductively, based on content, to include all possible clues about patient-centeredness. MT and CGC initially coded the same four diaries independently and, subsequently, discussed their findings with each other and with a third researcher (AD). During the coding process, all codes that emerged were discussed and organized to construct the final code tree (appendix 1). After both researchers coded separately the same 40 diaries no new codes emerged and saturation was reached. Following this, all previously coded diaries were recoded by MT and CGC using the final code tree. The remaining 52 diaries were then coded separately and individually by the two researchers (MT and CGC), with each researcher coding 26 diaries. Any uncertainties in decisions on coding were discussed through joint meetings with MT and CGC, and in case of persistent ambiguity, AD was consulted. Consecutively, we aggregated all inductive codes into four overarching themes. Within these overarching themes we finally, deductively, identified which dimensions of Scholl students actually described (see appendix 1 for inductive and deductive code tree).

Ethical approval

Ethics approval for this study was obtained by the Netherlands Association for Medical Education (NVMO). Written informed consent was obtained in all participants. Privacy of students and patients was guaranteed in the research project, all data were anonymized. (number 00544 and amendment dossier number: 2023.3.6.)

Results

In this study, we explored what students documented about patient-centeredness while longitudinally following a patient in a role of companion. The length of the diaries varied among the students and depended on the patient's category. Specifically, students had fewer contact moments with pregnant patients/young families, leading to comparatively shorter entries in their diaries. Students frequently cited challenges in scheduling meetings with this category, attributing it to the busy nature of these patients' lives at that particular stage, where time constraints and competing priorities limited their participation.

After inductively coding our data, we extracted four main overarching themes in students' diaries: 'communication', 'the person behind the patient', 'collaboration and organization in healthcare' and

their 'professional development'. In the following sections, we describe each theme. Additionally, in the underlined text we indicate which dimensions of Scholl's model of patient-centeredness are represented within that theme, which was the result of the deductive coding process.

Theme 1: communication

The initial theme we identified in the diaries is 'communication'. Students were present during patient-doctor interactions and their observations of these encounters led them to reflect upon the sometimes-conflicting circumstances of the doctor and the needs of the patient demonstrated in their communication:

I realize that despite the fact that as a doctor you experience great time pressure, making time for the patient and occasionally taking those extra five minutes to, for example, clearly explain what is going to happen or when the next check-up appointment will be, especially with older people, actually 'saves time' and prevents a lot of miscommunications. (student 1.1)

Students reflected both on the perspective of the doctor and that of the patients. Notably, for instance, they stressed the importance of allocating sufficient time for the patient to be heard, the necessity of providing comprehensive medical information to patients, and the need for (emotional) support when treatment no longer yields the expected results:

It strikes me how important it is to send a patient home with a clear story and clear instructions. [...] Especially with such serious diseases as the one Ms. [the patient] is suffering from, explanation and attentive listening to the patient is extremely important. Doctors can no longer cure in Ms. [the patient's] case, but they can still offer support. (student 1.3)

Furthermore, students highlighted the significance of 'the clinician-patient relationship.' They emphasized that the doctor should discuss with the patient (in the quote below referred to as 'the other one') on how they both want to establish this relationship:

It is important to know how the other person would like to shape the doctor-patient relationship, because this does not always correspond to your own idea. That's why you need to bring this up. (student 13.1)

Students also spontaneously mentioned 'essential characteristics' that doctors should have in their communication, such as being '*sincere and open*' and '*and taking the time to listen/hear someone out, it is often enough.*' (student 1.3).

As one student illustrated:

I also learn: pay attention to the patient, listen intensively, look at someone instead of staring at the computer, explain clearly, enunciate clearly (especially with hearing impaired people) and

accompany someone to the door at the end of the consultation.’ (student 1.1)

In summary, within the context of this theme, our analysis revealed that students offered comprehensive descriptions of various dimensions associated with patient-centeredness, namely that of emotional support, patient as a unique person, clinician-patient communication, essential characteristics of the clinician and the clinician-patient relationship.

Theme 2: the person behind the patient

Students gained increasing insight into their patients as they spent more time with them. First of all, students began delving into the emotional experiences of patients, offering interpretations of these emotions. They demonstrated an empathetic ability to understand and empathize with the emotional struggles that patients faced while dealing with illness. They wrote about patients not-wanting people to feel sorry for them, and patients’ feelings of frustration, fear or injustice. Secondly, students described coping mechanisms employed by patients to deal with their diseases both emotionally and practically. Both descriptions are reflected in the following quotes. In the first quote the patient wants to decide for herself when to get in contact with her friends/family, to avoid the constant reminder of her illness. In the second quote, a patient conceals upcoming emotions surrounding the disease.

Ms. indicates that it is very annoying when people call all the time out of compassion. ‘Send a text message or an App, then I can decide when I answer back!’ [...] I really realize then how confronting it must be when cards and phone calls come in all the time, no matter how well-intentioned, reminding you that you are going to die soon. (student 6.2)

I notice that Sir is very ‘giggly’ at times. I wonder if this is mostly friendliness, or more downplaying his illness and preferring not to acknowledge his current situation. I don’t dare to poke through this. (student 1.2)

Students were afforded a profound opportunity to gain insights into individuals’ lives, recognize their beliefs, feelings and needs of each patient as a unique person. By saying: ‘I realize then how confronting it must be’, students showed the importance of acknowledging ‘emotional support’. Throughout this theme, as evidenced by the aforementioned quotes and the following excerpt, students developed a keen understanding of the role played by the ‘involvement of family and friends’. In the first quote, a student witnessed an argument between the patient and her mother regarding the acceptance of assistance. In the second quote, another student described the impact of an CVA

(cerebrovascular accident) on a patient’s memory and her fear to get a new CVA as well as the physical complaints.

The woman told her mother that she didn’t like her mother cleaning everything. Mother said she meant well. [...] It came down to the fact that the lady did not like the fact that her mother wanted to do everything for her, while mother meant well that she gave all that help. The lady actually only wants to accept help if she asks for it herself. [...] I think the feeling of the lady is one of the core feelings of a chronically ill patient: you don’t want to experience pity. (student 27.1)

She comes back to this every conversation. She is very forgetful and knows this herself and finds it difficult to deal with this. There is also fear of having another CVA [cerebrovascular accident], she talks a lot about the previous times it happened and how helpless she felt then. She also suffers from joint stiffness and pain. She has difficulty maneuvering through her house (student 12.3)

In the subsequent quote, the patient expressed feelings of loneliness. Not having been married and without children, her social network and support group gets smaller and smaller. Students aptly acknowledged the importance of the ‘biopsychosocial perspective’ in the following quote.

The patient struggles with dependence. Since November last year she no longer has a car, which makes her very dependent on other people. [...] She especially misses the support she could receive from possible children. She also regrets that her friends have abandoned her since she moved to an assisted living facility. [...] Ms. does have many nieces and nephews, but they live too far away. [...] In the assisted living complex, she participates as much as possible in activities, [...] Even at that time, contact with her fellow residents remains minimal. (student 17.1)

In summary, our analysis of the students’ diary entries within this theme reveals a rich tapestry of dimensions pertaining to patient-centeredness. These dimensions encompass the appreciation of ‘the patient as a unique person’, the application of a ‘biopsychosocial perspective’ in understanding patient needs, the recognition of the critical role of ‘emotional support’, and the emphasis on ‘involvement of family and friends’ as integral components of patient care.

Theme 3: collaboration and organization in healthcare

Proceeding to our third theme, it is noteworthy that while students devoted comparatively fewer entries to this theme than to others, they nonetheless shed light on pertinent aspects related to healthcare organization. In the fragments we identified within this theme, students mentioned long waiting times, lack of good logistics, as well as aspects of coordination and continuity of care:

... but the appointment was tinted a bit by a nurse who was inducted to place PICC lines. Let's just say that 'sterility' is also quite a thing. Also, the system was not set up to quickly call the patient back in after the control X-ray was done. Since Mrs. went after it herself, the secretary called the doctor. The doctor informed her that the photo was good: Ms. could go. And so it happened. Once at home, the hospital called: where Mrs. was, because the nurse still had to flush the PICC line with heparin... (student 6.2)

Additionally, students underscored the significance of well-provided care, as exemplified by their comments: '...how important home care is in the dying process.' And 'With my own eyes I can experience how much support these people [home care] provide and how much good they do' (student 1.3). Furthermore, a student eloquently conveyed a patient's sentiment, noting that the patient felt 'Wonderful [...] to be helped in such an uncertain time. The doctor put us at ease'. (student 10.4)

Regarding patient information in healthcare, students described inadequate situations:

...the fact that every day there was a different doctor at the bedside who told yet another story was very annoying and damaged her confidence. (student 1.4)

In conclusion, this theme demonstrates the students' ability to recognize of the relevance of healthcare organization as they independently perceive the presence and absence of key dimensions of patient-centeredness, such as 'coordination and continuity of care', and 'patient information'.

Theme 4: students' professional development

Transitioning to our fourth theme, it is essential to reiterate that the role of the student was to be a companion, without direct medical responsibilities. This role proved to be difficult for them. The diaries reveal that they struggled with their position in relation to the patients. Within these struggles they touch upon patient-centeredness dimensions, particularly 'essential characteristic of the clinician' and 'clinician-patient relationship':

I would like to learn from this patient how to set my own limits. During the introductory meeting I noticed that the patient was very friendly, but sometimes a little too jovial. It seems interesting to me to see how I can keep the relationship balanced, where the balance is between professionalism and empathy and emotions. (student 12.1)

These struggles prompted students to write about their own professional attitude. They openly expressed feelings of uncertainty concerning their position towards the patient: 'I felt like an enormous intruder. How to deal with this?' (student 13.2). Additionally, they reflected on their own professional development:

'I am still looking for how I want to shape my professional attitude. I lean too much towards pleasing the other, which of course you can't always do as a doctor.' (student 21.2)

These reflections once again center around the concepts of the 'essential characteristic of the clinician' and 'clinician-patient relationship'.

The students felt tension within their professional development as medical doctors. On the one hand, they recognized their evolving competence, acknowledging that they were not yet fully-fledged medical practitioners. On the other hand, they felt a genuine desire to share their medical knowledge as 'patient information' when they felt the patient needed that.

I also hope to be able to build an open and professional relationship with Ms., in which I may be able to clarify medically things from time to time. Regarding the latter, I am hesitant. I am not a doctor and certainly do not want to assume this role. Incorrect information from my side must be prevented at all times (student 1.1)

They also expressed the belief that they needed to develop the ability to 'deal with emotions (student 7.1)', be able to establish their 'own boundaries (student 12.1)', and 'be more assertive (student 12.2)'. They referred to the clinician-patient relationship as 'building a professional relationship with my patient (student 1.1)' in which they valued 'keeping a professional distance [...]' while at the same time acknowledging that they are [...] 'still searching how I want to shape my professional attitude (student 21.2)'.

In summary, students spontaneously reflected on their professional attitude and development. Within these reflections, they addressed dimensions of patient-centeredness, such as 'essential characteristics of the clinician', the dynamics of building a 'clinician-patient relationship' and their role in providing 'patient information'.

Summarizing the mentioned dimensions of patient-centeredness

In our corpus, students were found to address nine out of the fifteen dimensions of patient-centeredness, as articulated by Scholl [11]: 'clinician-patient communication', 'patient as unique person', 'biopsychological perspective', 'essential characteristics of the clinician', 'clinician-patient relationship', 'involvement of family and friends', 'patient-information', 'emotional support' and 'coordination and continuity of care'. Conversely, the dimensions of 'patient involvement in care', 'physical support', 'patient empowerment', 'integration of medical and non-medical care', 'access to care', and 'teamwork and teambuilding' received limited or negligible mention. This

examination suggests that, within our dataset, students primarily directed their attention towards the underlying *principles* of patient-centeredness, with comparatively lesser emphasis on the *enablers* and *activities*.

Discussion

This study entailed an exploration of what medical students write about patient-centeredness in diaries while longitudinally following patients in the role of companion. We identified four themes students write about; communication, the person behind the patient, collaboration and organization in healthcare and the student's professional development. The first three themes are related to the dimensions in the model of Scholl [11]. Noteworthy is that the third theme, collaboration and organization in healthcare, was mentioned less extensively by the students. This corresponds with the finding of a validation study of the dimensions of patient-centeredness in which also these aspects of care (enablers) were less validated [15]. However, the first two themes of our study, communication and the person behind the patient, are consistent with the findings of the same validation study, in which they were ranked as 4th and 1st in relevance, respectively, of the dimensions of Scholl's model [15].

Within each of the four themes of our study we consecutively identified the dimensions of patient-centeredness according to the model of Scholl [11]. Students mentioned nine dimensions of patient-centeredness in their diaries, focusing on underlying *principles* of patient-centeredness; concerning the clinician, the patient and their relationship. This finding aligns with the outcomes of other studies involving longitudinal educational interventions with real patients, in which 'seeing the patient as a person' and establishing a meaningful relationship' were the main outcomes [19,24]. Additionally, the results of a recent realist review also corroborated our observations indicating that the underlying *principles* of patient-centeredness were more frequently learned in the educational interventions with real patients than *activities* and *enablers* [1]. Therefore, in sum, it appears that the existing educational interventions to foster patient-centeredness are a strong tool to experience and internalize the foundational *principles* of patient-centeredness.

In addition to the *principles* of patient-centeredness that students spontaneously addressed, there was a notable underreporting of dimensions related 'access to care', 'integration of medical and non-medical care', 'teamwork and teambuilding', 'patient involvement in care', 'patient empowerment' and 'physical support'. In other words, students provided relatively limited insights into *activities* and

enablers of patient-centeredness. This paucity in coverage can possibly be attributed to the specific role students assumed as companions to patients. In this role, they are less exposed to these enablers, which are the organizational aspects of care. Furthermore, considering the stage of their education, the students are yet to engage with the organizational aspects of care, as they were just about to start the clinical part of their studies. In contrast, a separate study involving third-year students who were explicitly instructed to reflect on the patients' interaction with the healthcare system reported a more thorough understanding of the functioning of the healthcare system [30]. These contradictory findings might be explained by the explicit assignment those students received. Therefore, it's plausible that students might need guidance to reflect more on these aspects of patient-centeredness.

Looking at the *activities*, students wrote less about 'patient involvement in care', 'patient empowerment', and 'physical support'. These facets closely relate to the dynamics of shared decision-making and the roles of patients and healthcare providers. This area still requires significant attention both in education and clinical practice [31,32]. Another reason for this finding that students underreported aspects of patient-centeredness might be a lack of education on the (complete) concept of patient-centeredness, which might be due to the breadth and variability in the concept of patient-centeredness, as reflected in the literature [11-14]. Therefore, enhancing students' understanding of the comprehensive scope of patient-centered care through education could potentially encourage them to engage more extensively with these dimensions.

An additional noteworthy finding of our study is the spontaneous reflection on students' professional development as future clinicians. These reflections align with existing research that suggest that a deeper patient-provider relationship, facilitated through longitudinal clerkships, can significantly contribute to the professional growth of medical students [33,34]. Our intervention offered this possibility to establish deep relationships between patients and students. These relationships, we believe, served as a catalyst for the students' deeper reflections. Moreover, ongoing engagement with patients in medical education nurtures a patient-centered identity, ideally early in the studies, so that it becomes an inherent and expected aspect of a student's professional attitude [35,36]. Therefore, students should be offered longitudinal interventions with real patients in the early stages of medical education to ensure that patient-centeredness becomes an integral part of their future identity and practice, aligning with the evolving expectations and demands of modern healthcare.

Strengths and limitations

In this study, our approach to coding involved two stages: first, an inductive coding phase, and second, a deductive coding phase. Coding inductively offered us the opportunity to maintain an open perspective, closely aligning with the narratives and experiences articulated by the students. Subsequently, by coding deductively, we could interpret our findings within the framework of a patient-centeredness model. By combining inductive and deductive analysis we were able to show that students spontaneously mention aspects of patient-centeredness even in the absence of explicit instructions to do so.

Our study presents several limitations. Firstly, our participants were not informed about the 'patient-centeredness' learning objective which, according to existing literature [37], can result in a lack of a clear sense of purpose for the assignment and potentially negatively impact learning. This concern is supported by literature stating that reflection-before-action and the perceived importance of patient-centeredness encourage students' reflection [38]. Thus, educators should create an environment which stimulates authentic reflection [39–41]. A second consideration is the role of companion. In a first evaluation study [42] students mentioned their nonmedical role was uncomfortable to them, since it was opposite to what they were used to in the medical context. Besides, students wrote about a lack of guidance and supervision by their mentors, which increased the discomfort. According to the authors this friction might have hampered their learning, which may be reflected in what they wrote down in their diaries. A third consideration of our study lies in the personal and individual learning experience. Learning from patient contacts about values and attitudes takes place in the minds of students, like beetles-in-the-box, a private place [43]. Therefore, we cannot pretend that what the students wrote down is what they have actually learned.

Implications for future practice

Following existing literature on the benefits of longitudinal patient follow programs, our study confirms the value of learning about patient-centeredness in such an intervention [17–20]. In addition, we agree with previous studies that students are receptive to take ownership of this concept early in their studies [35].

To overcome the friction between their role as companion and their usual medical role, we further suggest giving students more explanation about their role and the purpose of learning [2]. In addition, careful guidance from a supervisor during the intervention and forming peer groups to discuss their

experiences may reduce friction between the two roles and enhance learning [2,42]. Lastly, students reflected largely on several dimensions and less on other dimensions of patient-centeredness. Improving supervisors' and students' understanding of the full concept of patient-centeredness will help them take in the whole concept [2].

Implications for future research

The dimensions of patient-centeredness that students did not write about in their diaries present an intriguing avenue for future research. It would be valuable to investigate whether targeted education on the concept of patient-centeredness, coupled with explicit guidance in their assignments, could effectively stimulate students to write and reflect more comprehensively on these relatively underrepresented dimensions of patient-centeredness. In line with that, an area ripe for investigation involves assessing how such educational interventions would impact their patient-centered attitude as they transition into the clinical workplace. Understanding whether these experiences during medical training lead to lasting changes in their approach to patient care and interaction would provide valuable insights into the long-term effectiveness of patient-centered education.

Conclusion

This paper addresses the ongoing challenge of fostering patient-centeredness in medical education and offers valuable insights from diaries kept by the students. Using the method of thematic analysis, we managed to observe that as students assume the role of patient companions during longitudinal interactions, they spontaneously document various dimensions of patient-centeredness in their diaries. Their focus predominantly centers on underlying *principles* of patient-centeredness. Moreover, these experiences catalyze thoughtful reflections on students' own professional development. However, it is worth noting that certain dimensions of patient-centeredness receive less attention in their diaries. To ensure a comprehensive grasp of patient-centeredness among students, it is imperative to incorporate education on the concept of patient-centeredness, establish clear learning objectives, and provide structured guidance for reflective practices experiences during medical training.

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Data availability statement

The participants of this study did not give written consent for their data to be shared publicly, so due to the sensitive nature of the research supporting data is not available.

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Appendix1: Code Tree per Theme

The Inductive codes consist learning objective codes, reflection codes and description codes. Initially we tried to make a difference in reflective texts and descriptive text in the diaries. During the analysis, through discussion in the research team we came to the conclusion that we could not sufficiently mark the difference between

reflective and descriptive quotes. The differences between reflectively written texts and descriptively written texts were not evident. In addition, this difference between reflective and descriptive texts did not add anything to answering our research question. For these reasons, we subsequently chose not to make this distinction and to merge codes that were initially marked as descriptive or reflective, and otherwise had the same content.

	Codes-inductive	Definitions
Communication	Learning objective: communication	<i>This code is used if the students wants to learn about communication</i>
	Learning objective: how the clinician deals with the situation	<i>This code is used if the student wants to learn about how the doctor deals with emotions, illness and treatment of the patient</i>
	Learning objective: experience of patient with doctors/healthcare workers	<i>If the student wants to learn about patients' experiences with doctors/healthcare workers</i>
	Description: negative experience with the clinician	<i>This code is used if it concerns a negative experience of the patient with a doctor.</i>
	Description: patient does not feel heard or understood	<i>Description of how the patient does not feel seen or heard</i>
	Description: clinician-patient communication	<i>The student describes communication between patient and doctor/health worker</i>
	Description: positive experience with healthcare	<i>When a positive experience in healthcare is discussed, for example about nice doctors, healthcare in general.</i>
	Reflection: clinician-patient communication	<i>This code is used when there is reflection on the communication between clinician and patient</i>
	Reflection: student-patient communication	<i>Use this code when reflecting on the communication between student and patient.</i>
	The person behind the patient	Learning objective: emotional and social strain for the patient
Learning objective: impact of illness on patient's life		<i>This code is used if the student wants to learn what impact the disease has on the patient's life, for example: emotionally, practically.</i>
Learning objective: role of family/friends and environment		<i>Use this code if the student wants to learn about the role of the patient's family/friends/environment.</i>
Learning objective: Quality of life		<i>Use this code if the student wants to learn about what the quality of life is for the patient.</i>
Learning objective: dealing with changing clinical situation/phases in illness (sub-code of coping)		<i>Use this code if the student wants to learn how the patient deals with a changing clinical situation</i>
Learning objective: patient coping (practical and emotional)		<i>If the student's goal is to learn about how the patient deals with the situation/situation, practically and/or emotionally, coping.</i>
Learning objective: acceptance of illness (sub-code of coping)		<i>When the student wants to learn about how the patient accepts their illness.</i>
Learning objective: life lessons (sub-code of coping)		<i>This code is used when the student describes that they want to learn life lessons from the patient.</i>
Learning objective: what is important to the patient in their treatment/autonomy		<i>If the student wants to learn about what the patient finds important/chooses/moves and about the patient's (degree of) autonomy</i>
Learning objective: compare different patients with each other		<i>When the student wants to learn from comparing patients with each other.</i>
Learning objective: (course of) illness		<i>This code is used if the student wants to learn about the patient's clinical picture/process/course of illness</i>
Learning objective: progression of the disease (subcode of disease)		<i>When the student indicates that they want to learn about how a disease progresses over time.</i>
Description: coping (emotional and practical dealings) of patients with illness		<i>Student describes how the patient deals (emotionally and practically) with the situation/illness</i>
Description: patient's emotional experience		<i>A description of the emotions the patient feels</i>
Description: consequences of illness for the patient		<i>Student describes the consequences of the disease/situation for the patient</i>
Description: about quality of life		<i>A description about quality of life/in which quality of life is highlighted</i>
Description: about decease		<i>A conversation about decease and the process of decease.</i>
Description: role family/friends and environment		<i>Description of the role of family/friends and environment</i>
Description: what the patient thinks (cognition) about illness		<i>Description of what the patient thinks or believes about their illness/situation/health</i>
Reflection: consequences of the disease for the patient		<i>Student reflects on the consequences of the disease for the patient</i>
Reflection: acceptation	<i>Use this code when reflecting on how the patient accepts or does not accept his illness.</i>	
Reflection: palliation/decease	<i>This code is used when reflecting on palliative care or care in the process of decease</i>	
Reflection: the role of family/friends/environment	<i>This code is used when the student reflects on the role of family/friends/environment in the patients' disease process</i>	
Reflection: on the patient's emotions	<i>The student reflects on the patient's emotions</i>	
Reflection: (coping) on how the patient deals with the illness practically	<i>When reflecting on how the patient practically deals with their illness or with the consequences of their illness, coping</i>	
Reflection (coping) on the patient's emotional dealing with illness/health	<i>This code is used when the student reflects on how the patient emotionally deals with illness/health and coping strategies</i>	

(Continued)

(Continued).

	Codes-inductive	Definitions
	Reflection: what the patient finds important	<i>This code is used when the student reflects on what the patient finds important. This code is therefore related to 'patient as a unique person'. However, this should be about reflection on this.</i>
	Reflection: patient autonomy (subcode of 'what the patient finds important')	<i>When the student reflects on how the patient's autonomy is dealt with or what the patient's autonomy entails</i>
	Reflection: quality of life	<i>When there is reflection in the logbook about quality of life (for example: That it is more important than treatment, how people view life).</i>
Collaboration and organization in healthcare	Reflection: empathizing with the patient/empathy	<i>The student reflects on the patient's situation, empathizes with the patient's situation, and shows that they sympathize with the patient's situation.</i>
	Reflection: progression of the disease	<i>Use this code when reflecting on the progression of the disease.</i>
	Learning objective: patient's experience with the healthcare system	<i>This code is used if the student wants to learn about how the healthcare system affects the patient.</i>
	Learning objective: healthcare organization	<i>This code is used if the student describes that they want to learn about the organization of healthcare.</i>
	Description: poor (organization of) care for patients	<i>The student describes the consequences of poor care/organization of care for the patient</i>
Student's professional development	Reflection: care for the patient in a broader sense (organization)	<i>This code is used if the student refers to care in a broader sense for the patient, for example home care, but also organization, etc.</i>
	Learning objective: professionalism of the student	<i>If the student wants to learn about/improve their own professionalism</i>
	Description: student emotions	<i>The student describes the emotions they feel</i>
Principles	Reflection: professionalism	<i>Use this code when reflecting on the student's professional attitude.</i>
	Codes – Deductive (Scholl et. al. 2014)	
	Essential characteristics of the clinician	<i>A set of attitudes towards the patient (e.g., empathy, respect, honesty) and oneself (self-reflectiveness) as well as medical competency</i>
	Clinician-patient relationship	<i>A partnership with the patient that is characterized by trust and caring</i>
	Patient as a unique person	<i>Recognition of each patient's uniqueness (individual needs, preferences, values, feelings, beliefs, concerns and ideas, and expectations)</i>
Enablers	Biopsychosocial perspective	<i>Recognition of the patient as a whole person in his or her biological, psychological, and social context</i>
	Clinician-patient communication	<i>A set of verbal and nonverbal communication skills</i>
	Integration of medical and non-medical care	<i>Recognition and integration of non-medical aspects of care (e.g., patient support services) into health care services</i>
	Teamwork and teambuilding	<i>Recognition of the importance of effective teams characterized by a set of qualities (e.g., respect, trust, shared responsibilities, values, and visions) and facilitation of the development of such teams</i>
	Access to care	<i>Facilitation of timely access to healthcare that is tailored to the patient (e.g., decentralized services)</i>
	Coordination and continuity of care	<i>Facilitation of healthcare that is well coordinated (e.g., regarding follow-up arrangements) and allows continuity (e.g., a well-working transition of care from inpatient to outpatient)</i>
Activities	Patient information	<i>Provision of tailored information while taking into account the patient's information needs and preferences</i>
	Patient involvement in care	<i>Active involvement of and collaboration with the patient regarding decisions related to the patient's health while taking into account the patient's preference for involvement</i>
	Involvement of family and friends	<i>Active involvement of and support for the patient's relatives and friends to the degree that the patient prefers</i>
	Patient empowerment	<i>Recognition and active support of the patient's ability and responsibility to self-manage his or her disease</i>
	Physical support	<i>A set of behavior that ensures physical support for the patient (e.g., pain management, assistance with daily living needs)</i>
	Emotional support	<i>Recognition of the patient's emotional state and a set of behavior that ensures emotional support for the patient</i>