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Advances in Clinical Pharmacy Education and Training

Enhancing Pharmacy Students' Competencies in Continuous Glucose Monitoring Counseling: An Objective Structured Clinical Examination-Based Training Evaluation

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ABSTRACT

Background: As accessible health care professionals, pharmacists are increasingly expected to engage with wearable technology, such as with continuous glucose monitors (CGM) and their associated data that are driven by the ongoing digital transformation. However, formal education on CGM data and its interpretation as well as related digital tools is not yet routinely integrated into pharmacy curricula, leaving a gap in students' preparation. The aim of this study was to enhance pharmacy students' competencies and confidence in CGM counseling through targeted training and to evaluate the effectiveness of this intervention.

Methods: A 4-h seminar was delivered focusing on CGM data and counseling procedures, including practical examples. Students' performance in CGM-counseling and self-assessment of their CGM competencies were assessed in a pre–post manner using Objective Structured Clinical Examination (OSCE) checklists. Additionally, training satisfaction and perceptions of the future integration of wearables and their role in pharmacy practice were captured.

Results: Following the training intervention, pharmacy students demonstrated a significant improvement in their consultation skills, with OSCE increasing from a mean of 19.12 (±7.66) to 63.47 (±12.34) percentage points ($p < 0.001$). Additionally, participants reported a significantly higher self-assessed performance and expressed notable satisfaction with the module.

Conclusion: Targeted training in CGM counseling significantly improves pharmacy students' competencies specific to CGM data and enhances their confidence in this area. This training prepares students for interpreting CGM data as one example of digital health solutions and wearables. Whether similar training effects extend to other digital health technologies remains to be determined by future research.

1 | Background

Community pharmacists are highly accessible and trusted health care professionals, central to patient education, counseling, and medication management [1, 2]. Working long hours with no appointment barriers and high accessibility, pharmacists are often the first point of contact for health-related advice [3]. Pharmacists combine pharmacological expertise with

Florian Kinny and Sabina Schlottau contributed equally to this work.

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Key Points

- Can targeted training enhance pharmacy students' competencies and confidence in continuous glucose monitoring (CGM) counseling regarding data interpretation?
- In this pre–post analysis using objective structured clinical examination (OSCE) checklists, 50 students showed statistically significant improvement in CGM counseling skills regarding CGM data interpretation and self-assessment after the CGM training intervention.
- Targeted CGM training can enhance pharmacy students' competencies and confidence for patient counseling specific to CGM data; similar benefits for other digital technologies should be explored in future research.

communication skills to explain complex health information and convey it in patient-centered ways. Beyond medication counseling, they offer competent advice on lifestyle issues such as nutrition, physical activity, smoking cessation, and disease prevention [4–6]. Their role has expanded to include medication reviews, vaccination, health checks, and chronic disease management [7–10], underscoring their importance as partners in interdisciplinary care where timely, personalized support is essential.

With growing health care demands, digitalization has reshaped how health information is generated, shared, and interpreted. Beside symptoms and medication queries, today's patients often present raw data from apps, have wearables, or use telemedicine [11, 12]. Hence, pharmacists are expected to engage with such data, offering clarification, validation, and interpretation [13, 14]. With the rapid rise in digital device-based self-monitoring [15–17], pharmacists' counseling must extend beyond medications to include contextualizing health data gathered directly from patients. Trends in digital health adoption extend beyond usage by younger or digitally literate populations only, with increasing numbers of individuals across all age groups employing these new technologies for preventive care and chronic disease management [18].

Continuous glucose monitoring (CGM) is a modern digital health tool originally developed for diabetes management that continuously records real-time glucose values via a small subcutaneous sensor transmitting data to smartphones or receivers [19, 20]. These devices provide users with detailed glucose trends and enable sharing of data with health care providers for personalized interventions [21]. While especially relevant for insulin-dependent diabetes, CGM use has expanded to people with type 2 diabetes, prediabetes, and health-conscious individuals interested in lifestyle monitoring [20, 22]. Consequently, pharmacists increasingly encounter patients seeking advice on CGM device use, data interpretation, and lifestyle implications. Pharmacist-led interventions involving CGM have demonstrated clinical benefits such as reduced hemoglobin A1c (HbA1c) levels and improved quality of life [23, 24]. In Germany, the relevance of counseling is underscored by recent legislative developments. The draft Healthy Heart Act (German "Gesundes-Herz-Gesetz") proposes expanding preventive services in pharmacies including structured diabetes counseling with CGM data interpretation [25]. Although the final adoption and implementation timeline remain uncertain, this draft underscores the increasing sociopolitical attention to digital health and the potential future need to equip pharmacists with competencies in digital health technologies and patient counseling. Pharmacy education must therefore advance to prepare future pharmacists not only to advise on medications but also to analyze real-time digital health data in the context of individual health and lifestyle behavior.

The rising importance of CGM data in diabetes care has been acknowledged in pharmacy education research [26–34]. For instance, CGM-specific modules have been introduced in some curricula to improve students' factual knowledge, attitudes, and self-confidence in diabetes counseling regarding CGM. These modules often included components such as didactic lectures, e-learning units, hands-on training, or group exercises focused on initializing CGM systems, interpreting CGM readings, reimbursement, and formulating individualized counseling strategies. While these teaching modules remain important and because foundational knowledge is essential for effective future counseling, there is a gap regarding how students translate acquired knowledge and how they apply it in simulated patient counseling. Therefore, there is a need for research that specifically examines the counseling competencies of future pharmacists regarding CGM data interpretation. Various methods have been used to measure knowledge transfer objectively, such as quizzes or pre–post tests. However, these methods are limited in their ability to assess how learners apply the acquired knowledge in practice or in simulated practical conversations. What has been missing is the application of objective structured clinical examination (OSCE) [35] formats (a widely established gold standard in assessing clinical communication skills) in assessing counseling competencies in CGM data and students' interpretation of CGM data.

The present study aimed to systematically assess the CGM data counseling competencies of pharmacy students with a simulated patient involving CGM data interpretation, as well as to evaluate students' self-assessed confidence and satisfaction with the training. Using standardized OSCE checklists and a pre–post design, this study examined whether a concise training intervention could improve the objective quality of pharmacy students' counseling in a controlled and reproducible setting.

2 | Methods

This study was conducted in June 2025 at the Institute of Clinical Pharmacy and Pharmacotherapy at Heinrich-Heine University Duesseldorf. As part of the seminar "Clinical Pharmacy," final semester pharmacy students' performance and self-assessment in counseling competencies on CGM data were evaluated. The study followed a pre- and post design over 3 study days. Each participant had a total study workload of 4.5 h. Study data were collected in a pseudonymized manner to enable comparisons between pre- and post test results. Previous experience with CGM data analysis was an exclusion criterion. The study was approved by the Ethics Committee of the Medical Faculty of

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Heinrich-Heine University Duesseldorf (approval no. 2025-3173) and all participants signed an informed consent.

On Day 1, before reviewing a 5-min sample Ambulatory Glucose Profile (AGP), participants completed a self-assessment questionnaire. Next, they counseled a simulated patient for up to 10 min, during which an evaluator observed and assessed their performance using a checklist.

On Day 2, participants attended a 4-h training course titled "Counseling on CGM Data" conducted by two staff members. The training combined theoretical knowledge on CGM functions, metrics, and AGP interpretation using methodology from the literature [21, 36–38] with practical components on pharmacists' counseling covering communication, data collection, analysis, and recommendations regarding lifestyle and possible therapy adjustments. Understanding was assessed using interactive questions via Slido (Cisco Systems Inc., San José, California, USA) [39]. During the practical session, participants worked on simulated patient cases followed by plenary discussions and concluded with a patient case role-play.

On a final day, Day 3, the post-OSCE was conducted same as on Day 1, but the self-assessment questionnaire was completed after students reviewed sample AGPs. Two new cases replaced the two previous ones, and the training ended by collecting course evaluation and feedback from the students.

To objectively evaluate students' performance, OSCE checklists based on the frameworks of Kröger et al. [36] were developed by two staff members and reviewed by four additional researchers. OSCE checklists covered five sections: introduction, medical history, data analysis, recommendations regarding lifestyle and possible therapy adjustments, and communication. Four cases with matching checklists (Data S1) were created to avoid bias, each with a maximum score of 34 points. Students were evaluated using a binary checklist marking each criterion as either "criterion met" or "criterion not met." Importantly, a criterion was only marked as met if the student not only mentioned the respective item (e.g., Time in Range [TIR]) but also accurately interpreted and effectively communicated its meaning during counseling. This ensured that the assessment focused on students' counseling competencies rather than mere checklist completion. Final scores were calculated as the percentage of criteria met. The same evaluators assessed both pre- and post-OSCE to ensure consistency.

Participants were asked to subjectively evaluate their knowledge, skills, and practical approach to counseling sessions using a 5-point Likert scale, where 1 indicated "*strongly disagree*" and 5 indicated "*strongly agree*" (Data S1). The feedback form for the training course consisted of two sections: a 5-point Likert scale where 1 indicated "*strongly disagree*" and 5 indicated "*strongly agree*" to evaluate the content and delivery of the training, and open-ended questions (Data S1).

To compare pre- and post-OSCE scores, a paired t-test was used, while the five checklist categories were analyzed with the Wilcoxon signed rank test both at $\alpha = 0.05$. Associations between self-assessed performance and job experience were examined using Pearson's correlation, and Cohen's d quantified effect size between groups with and without experience. Values exceeding 1.5 times interquartile range (IQR) were considered outliers. Likert scale responses were analyzed by arithmetic mean and 95% confidence interval (CI) displayed in a forest plot, with consensus assumed when the CI did not cross the line at 3. Data handling was performed with Microsoft Excel (Microsoft Corporation, Redmond, Washington, USA) [40] and R-Programming language [41], while statistical analyses were conducted with OriginPro 2021 (OriginLab, Northampton, Massachusetts, USA) [42].

3 | Results

A total of 52 final semester pharmacy students at Heinrich-Heine University Duesseldorf were recruited for the study. Data from 50 students were analyzed at the end of the study as

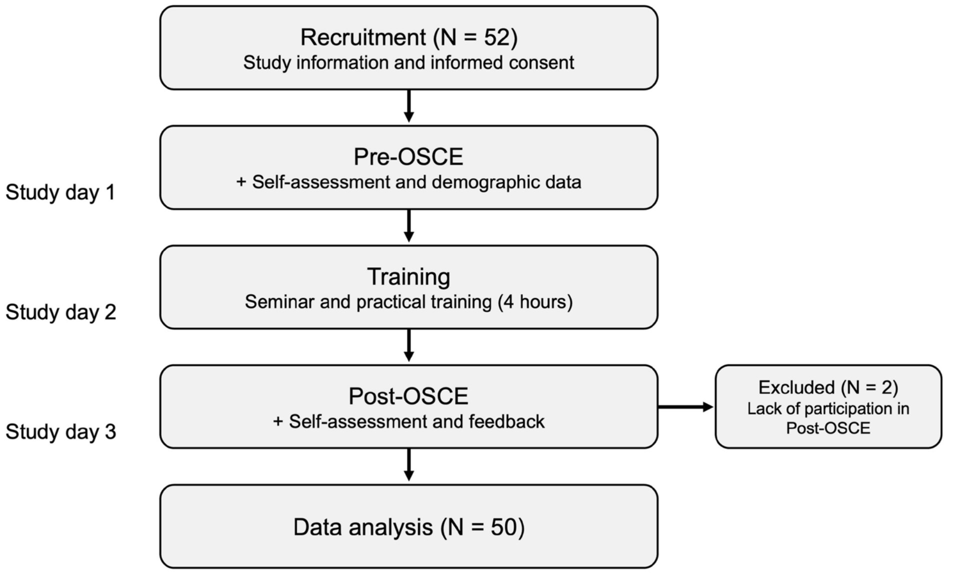

FIGURE 1 | Overview of the study design from recruitment to data analysis. OSCE = objective structured clinical examination.

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two participants did not take part in the post-OSCE (Figure 1). Table 1 presents participant characteristics. The pharmacy students had completed a pharmacology lecture course 1 year prior, which included diabetes as a topic with a focus on disease pathology, epidemiology, therapeutic options, pharmacological agents, and their mechanisms of action; however, digital tools such as CGM and interpretation of CGM data were not part of the curriculum.

Pharmacy students' performance during simulated patient counseling was evaluated using a standardized OSCE assessment checklist. Students demonstrated a significant improvement following the training, as evidenced by a significant increase in the OSCE scores, from pre-OSCE (19.12% ± 7.66%) to post-OSCE (63.47% ± 12.34%) ($p < 0.001$) (Figure 2). Even among participants with prior professional experience (e.g., working as a pharmaceutical technical assistant in a community pharmacy), an average improvement of 32.72 (±14.27) percentage points, ranging from 8.82 to 50 from pre- to post-OSCE, was observed. The average duration of professional experience was 6.56 years, ranging from 1 to 10 years. In the pre-group, one participant obtained a maximum score, which was classified as an outlier. Notably, this participant had prior working experience as a pharmaceutical technical assistant. A significant improvement was observed across all five categories. Figure 3 displays OSCE scores for both the pre- and post intervention assessments, stratified by category.

TABLE 1 | Participant characteristics ($n = 50$).

Age	
Mean (±SD)	24.96 (±3.21)
Median	24
Range	21–34
Gender	
Male, *n* (%)	16 (34%)
Female, *n* (%)	34 (68%)
Job experience	
Yes, *n* (%)	8 (16%)
No, *n* (%)	42 (84%)
CGM experience	
Yes, *n* (%)	0 (0%)
No, *n* (%)	50 (100%)

Abbreviations: CGM = continuous glucose monitoring; SD = standard deviation.

Among all participants, there were only eight individuals who showed a decline in performance in just one category. Of these, seven obtained a lower post-OSCE score in category E (communication) compared with the pre-assessment. For participants with previous work experience in the community pharmacy, self-assessment was rated significantly higher than for those without prior work experience ($p = 0.01203$, Cohen's $d = 1.16$). The correlation between work experience and self-assessment was positive and statistically significant ($r = 0.397$, $p = 0.0043$).

For the students' subjective self-assessment, questionnaires were used at the beginning and end of the study. All students consistently rated their skills higher at the end of the study compared with the beginning of the study. The evaluation showed increases in mean values and 95% CIs in the areas of knowledge and confidence improvement in CGM systems and in counseling. Before the pre-OSCE, the evaluation of four statements was not significant. These statements were related to the motivation of diabetes patients, knowledge of factors influencing glucose, self-confidence in counseling on hypo- and

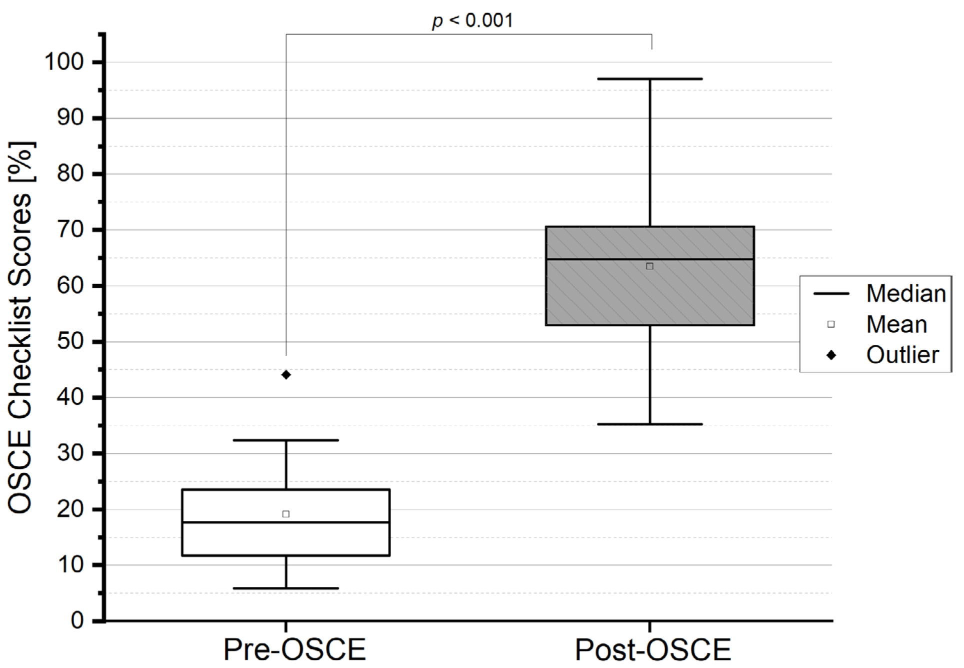

FIGURE 2 | Box plots of OSCE checklist scores before and after the OSCE. Scores were compared using a one-sided paired t-test with a significance level of $\alpha = 0.05$. OSCE = objective structured clinical examination.

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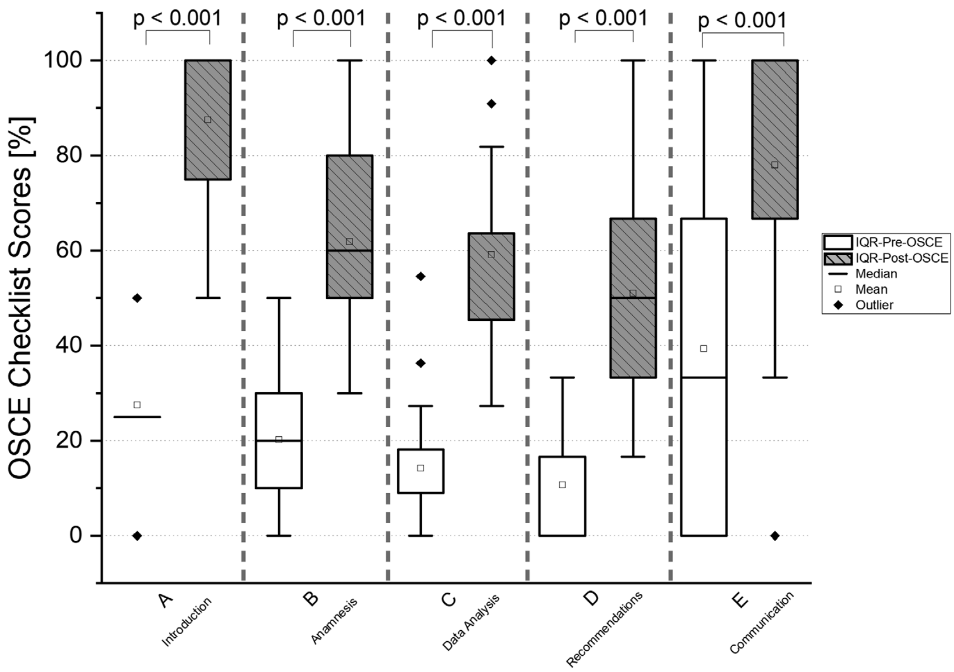

FIGURE 3 | Box plots depicting OSCE checklist scores for each section between pre- and post-OSCE. A Wilcoxon signed rank test ($\alpha = 0.05$) was used to compare OSCE scores between pre- and post groups. IQR = interquartile range; OSCE = objective structured clinical examination.

hyperglycemia, and overall confidence in interacting with people living with diabetes. After the post-OSCE, all 12 statements showed significant levels of agreement (Figure 4). Table 2 shows the anonymous evaluation of the pharmacy students' training covering content, duration, relevance, and benefit. Mean values and 95% CI were all within the agreement range.

4 | Discussion

This study demonstrates that pharmacy students can achieve a significant improvement in competencies in evaluating the CGM data of simulated patients and in counseling them through targeted training. Objective and subjective parameters both showed that the competencies and confidence of pharmacy students increased. During this training, students learned how to gather relevant data during medical history, interpret CGM data, incorporate it into a broader context, and develop patient-oriented recommendations.

To systematically and objectively assess the success of such teaching modules, pre-/post-assessments are required. For this, OSCEs represent the gold standard because they allow an evidence-based evaluation of learning success [35, 43–45]. In addition to other objective parameters, students' self-assessment was collected before and after the study. The self-assessment evaluation revealed that students consistently rated their skills, knowledge, and confidence higher after the training than before. The smallest difference in the mean values between pre- and post-assessment was seen in statements #7 and #8, which addressed the confidence in counseling people living with diabetes on medication, lifestyle, and hypo- and hyper-glycemia. Both before and after the study, the statements were generally answered with agreement, which may be related to previous knowledge acquired from other previous lectures in this area such as pharmacology.

In addition, students were asked to provide anonymous feedback showing that students perceived progression in their own learning process. Based on the five evaluated statements, the training was rated positively by the students in terms of content, duration, relevance, and benefit. Forty-nine of the 50 students believed that wearables will play a major role in pharmacy practice in the future. The aspect of counseling and the collection of health data were particularly emphasized. Students indicated that they would have liked to explore in greater depth the topics of therapy adjustments, nutrition, and lifestyle in people living with diabetes and the interpretation of laboratory parameters. This was a relevant finding to expand on this content in the future in light of interprofessional collaboration with physicians and diabetes teams. An important aspect here is that the curriculum should not continuously be expanded with new content without a systematic evaluation of existing courses. A review of teaching contents seems appropriate to integrate modern topics such as interpretation of digital health data without overloading the curriculum. Furthermore, some students indicated the need for additional counseling time. The counseling time was deliberately limited to a maximum of 10 min to reflect the real time for counseling in community pharmacies where maintaining profitability dictates shorter duration of such sessions. Nonetheless, the authors remain optimistic that offering more training courses for pharmacy students will result in time-efficient patient counseling.

The aspect of the training which needed improvement, as stated by the students, was to receive "after-OSCE feedback" by the facilitators of the training. This is an understandable point of criticism from the students' perspective, as receiving appropriate

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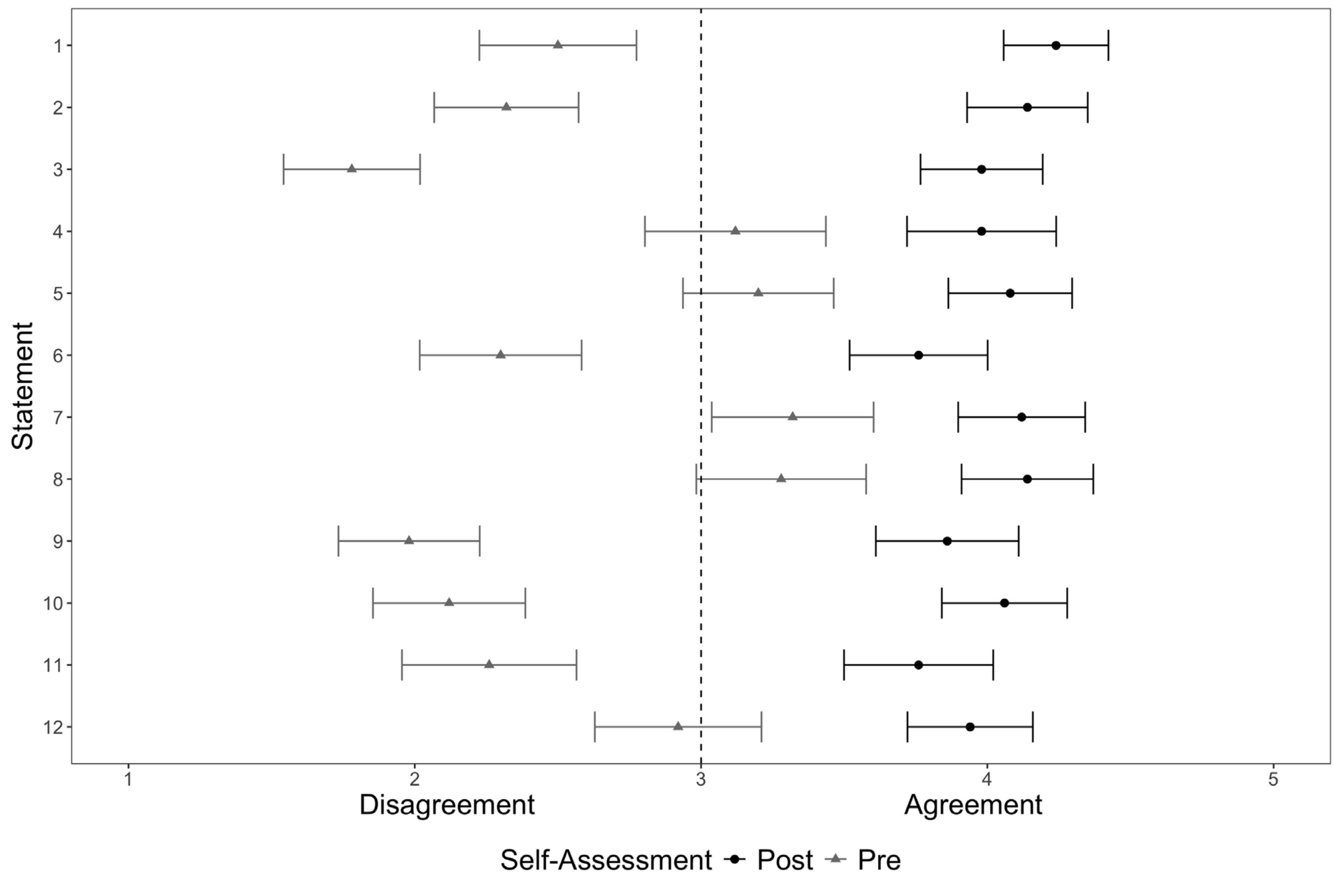

FIGURE 4 | Forest plot describing the students' self-assessment before (gray) and after (black) the study. The triangles (pre)/dots (post) show the mean values and the horizontal bars show the 95% confidence interval. The *x*-axis corresponds to the Likert scale from 1 = "*strongly disagree*" to 5 = "*strongly agree*," and three marks the neutral position (vertical dotted line). The statements were the following: (1) I have knowledge about the use of CGM systems. (2) I have knowledge about the functionalities of CGM systems. (3) I can advise patients on the prescription and dispensing of a CGM device. (4) I know how to motivate diabetes patients to adhere to their therapy. (5) I have knowledge about the factors influencing glucose profiles. (6) I feel confident to answer extensive questions from patients about diabetes mellitus and CGM. (7) I feel confident advising diabetes patients on their treatment and lifestyle. (8) I feel confident to educate patients about the relevance of hypo- and hyperglycemia. (9) I have confidence in my knowledge regarding the application of a CGM sensor. (10) I feel competent to analyze CGM data. (11) I feel confident to suggest therapy adjustments to the physician based on CGM data. (12) I feel confident in interacting with diabetes patients. CGM = continuous glucose monitor.

feedback may have contributed to better learning outcomes. However, the feedback was intentionally omitted by the study team to minimize bias, as receiving feedback could potentially favor information exchange among students and thereby influence the study outcomes. Instead, students were offered the option to contact the study coordinators after study completion for any follow-up questions.

The digital transformation of the entire health care sector requires pharmacists to be trained in CGM and other digital health topics. With the expansion of pharmaceutical services as well as wearables and apps flooding the markets, pharmacists are facing new tasks, responsibilities, and opportunities [3]. As more people with diabetes and also healthy adults use CGM for lifestyle monitoring [22], future pharmacists should be trained to interpret CGM data and provide advice. This will enable them to effectively translate digital data into effective patient communication. Unlike in the medical setting, the focus here is not on diagnostics and initiating therapy, but on counseling and low-threshold support. Such courses for pharmacy students can provide the foundation for service-oriented digital health care application in their future practice. There are already other studies with focus on CGM including pharmacy students. The projects range from theoretical teaching modules to practical and interactive modules [26–34]. In Germany, the first steps have already been taken to integrate the topic of digital health and wearables into the teaching of pharmacy students [31, 46]. Kinny et al. developed a hands-on wearable course as part of an elective course [32]. Four students wore a CGM device as well as a cuffless blood pressure device for 2 weeks under the supervision of two institute members. The data were subsequently analyzed and evaluated in collaboration with the students. Questionnaires showed that the students' skills and confidence improved during the course. However, due to the small number of participants in the elective course, the results cannot be generalized. The next step was to offer a CGM course for all students in the clinical pharmacy seminar. As a practical course was not feasible due to high cost, time, and staff effort, a theoretical course was held. Students' knowledge of CGM was determined by a quiz and self-assessment by questionnaires. It was demonstrated that knowledge and confidence of pharmacy students could be improved after a 2.5-h seminar [31]. This theoretical module represents a

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TABLE 2 | Student feedback on CGM training.

Statement		Mean (±SD)	95% CI
1.	The content of the training was presented in an understandable way	4.64 (±0.53)	4.49–4.79
2.	The training covered all relevant aspects of diabetes counseling	4.64 (±0.76)	4.25–4.67
3.	The duration of the training was appropriate	4.36 (±0.90)	4.11–4.61
4.	The training should be included in the curriculum of the pharmacy courses	4.68 (±0.71)	4.48–4.88
5.	The study has given me practical tools that I feel confident using	4.62 (±0.64)	4.44–4.80

Note: Evaluating five statements after the study using a Likert scale (1 = "*strongly disagree*" to 5 = "*strongly agree*").
Abbreviations: CI = confidence interval; SD = standard deviation.

significant advancement in digital health education integration; however, the component of pharmacist-led counseling has yet to be incorporated.

There are several studies in the literature on practical CGM training with pharmacy students in the United States of America (USA) [26, 28, 29, 34]. Sherrill and colleagues were one of the first to develop a practical CGM teaching module for pharmacy students and practicing pharmacists [28]. Participants wore a CGM device for a week. The results and experiences were then discussed. Questionnaires were completed before, immediately after, and 1 year after the course. The evaluation of the questionnaires showed improvements in the participants' knowledge and confidence, with knowledge tending to decrease while confidence remained the same over time. Lee and colleagues investigated the integration of hands-on CGM training into the pharmacy curriculum [29]. Pre–post surveys were conducted, which revealed that students felt more confident because of the hands-on CGM training. An additional benefit was reported in the form of improved health behavior. Students rated the integration of the teaching module into the curriculum as positive. Lobkovich et al. described a practical CGM course with pharmacy students focusing on user-wear experience [34]. Therefore, the questionnaires were used to assess not only the students' knowledge but also their empathy. Wearing a CGM device led to higher empathy, which enhanced the educational impact of the course. Folz and colleagues have extended the concept of a practical CGM-teaching study and conducted a randomized controlled trial (RCT) [26]. The intervention group wore a CGM device, while the control group did not. Both groups received a seminar and conducted standardized patient encounters for the prescription of a CGM device. The standardized patient cases were developed according to the concept of OSCEs. A direct comparison showed that wearing a CGM device led to better performance during the consultation and increased confidence. However, it should be noted that hands-on courses may not be feasible for every institute due to the high costs involved. Candelario and colleagues also conducted an OSCE-similar study, in which they assessed the counseling performance of pharmacy students on the set up and use of a CGM device [33]. In contrast to the authors' OSCE study which addressed the interpretation of CGM data, Folz et al. [26] and Candelario et al. [33] focused on the prescription and initiation of CGM devices, respectively. Overall, CGM modules have already been implemented in the form of several different courses. Knezevich and colleagues therefore assessed the form in which CGM modules are offered in Doctor of Pharmacy (Pharm.D.) programs in the USA [30]. For this purpose, an online survey was conducted in which 57 locations participated. The majority stated that CGM lectures were offered with an average duration of 1 h. Elective courses and practical exercises were also indicated as modules. This work confirms that there is still a need to further investigate and optimize the scope, duration, and implementation for CGM modules. The question of how a CGM course could be integrated into the Pharm.D. curriculum was addressed by Litten and colleagues [27]. The authors describe that there are numerous modules that are suitable for integrating CGM into teaching, considering the financial situation. In terms of content, it is recommended to cover CGM basics and compare devices, to address CGM data, analysis, and patient counseling, and to include administrative topics. Academic supervisors must decide how to adapt and integrate CGM content into the curriculum best. Litten and colleagues refer to the positive effect of CGM training on knowledge, skills, and confidence on Pharm.D. candidates. It should be considered that the implementation of such training should take into account the educational level and should therefore be adapted for pharmacy students. To the authors' knowledge, the presented study is the first OSCE-based training course that specifically teaches and objectively assesses counseling skills for interpreting CGM data. Previous studies have focused on counseling situations involving prescriptions and the setup of CGM devices, but not on assessment-based counseling regarding CGM-data interpretation.

In summary, this study has shown that it is feasible to successfully teach pharmacy students in evaluating CGM data, combined with CGM advice, and ultimately leading to enhanced patient counseling confidence. However, the limitation of this study was that the assessment of competencies and counseling skills was performed directly after the training. It is therefore unclear whether acquired knowledge and skills will last until the students start their professional pharmacists' career, warranting continuous CGM education. Furthermore, the study was designed with simulated patients; therefore, it cannot be guaranteed that the students would provide the same quality advice to real patients in their clinical practice. Another limitation is that the study was conducted as a pre–post design and not a RCT. The authors opted for a pre–post design because RCT would require a control group receiving no or limited training, which was ethically not sound as students would be deliberately excluded from gaining additional competencies. A pre–post design ensured that all students included benefited from the training. In addition, the study examined the extent to which students were able to improve their skills as a result of this training. This effectiveness data of the training can be used to assess whether the training should be included as a mandatory part of a pharmacy student's curriculum in Germany. In the future, the teaching module described in this paper could

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be expanded and linked to the counseling component of CGM data with the practical aspect from other studies. However, sufficient financial resources would be needed for implementation. In Duesseldorf, no extraordinary adjustments to the curriculum were necessary, as the OSCE format is already implemented into the clinical pharmacy curriculum. Accordingly, it can be assumed that implementation at other universities with established OSCE structures would also be possible. In addition, the multiday structure of the course was deliberately designed to be as efficient as possible: the number of days was reduced to the necessary minimum without compromising the didactic value, and costs were kept low by using patient cases without wearing CGM devices. Nevertheless, the authors remain optimistic that the teaching of digital health and wearables for pharmacy students will continue to develop and will remain up to date.

5 | Conclusion

The implementation of CGM counseling training regarding CGM data and its interpretation in the teaching of pharmacy students offers promising potential to enhance students' competencies in understanding and communicating CGM results to patients. After completing the training, students demonstrated objectively higher skills and increased confidence in interpreting CGM data and advising patients accordingly. Importantly, this study's incorporation of an OSCE-based assessment provides a robust model for evaluating counseling competencies in this area. Preparing future pharmacists for the digital health care landscape requires strengthening both competence and confidence in CGM data interpretation. While CGM data interpretation represents one key component of digital health services, our findings highlight its importance as a foundation for advancing personalized patient monitoring and support.

Author Contributions

Florian Kinny: writing – review and editing, writing – original draft, project administration, methodology, formal analysis, data curation, conceptualization. **Sabina Schlottau:** writing – review and editing, writing – original draft, project administration, methodology, formal analysis, data curation, conceptualization. **Stephanie Laeer:** writing – review and editing, supervision, project administration. **Emina Obarcanin:** writing – review and editing, supervision, project administration.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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