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Impacting Nursing Students' Confidence and Skills in Utilizing Continuous Glucose Monitoring Devices

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Abstract

Purpose: Continuous glucose monitoring (CGM) provides a more reliable and convenient way for patients to check blood glucose levels than fingerstick monitoring. Patients in rural areas may have less access to CGMs than those in urban areas. The purpose of this project was to provide focused education about CGMs and a two-week user-wear experience to undergraduate nursing and family nurse practitioner (FNP) students in a rural liberal arts university through an intraprofessional workshop and user-wear experience.

Sample: Students eligible for participation in the study included those in the graduate FNP (n=16) and undergraduate pre-licensure Bachelor of Science in nursing (BSN) (n=35) programs.

Methods: All eligible FNP and BSN students (n=51) participated in the in-person educational session on CGMs. At the beginning of the CGM workshop, students were asked to complete the

pre-implementation survey. During the workshop, students and faculty were educated about CGMs and given the opportunity to self-apply a CGM for a two-week user-wear experience. At the end of the user-wear experience, students were encouraged to complete the post-implementation survey.

Findings: All 10 scored survey items measuring student familiarity and perception of skill with CGM devices had statistically significant differences in pre- and post-survey ranked scores. Review of the qualitative responses revealed four themes: understanding, confidence, personal experience, and clinical preparation.

Conclusions: The intraprofessional CGM workshop and user wear experience allowed undergraduate BSN and graduate FNP students to engage with each other in a clinical and experiential learning activity to improve their understanding, confidence, and skills in diabetes management with CGM devices. All students reported improved self-perception of confidence and skills in using CGMs after the workshop. It is crucial for undergraduate and nurse practitioner students to become more familiar with CGMs through workshops and hands-on activities, especially in rural areas where CGM use is not optimized.

Keywords: diabetes, technology, nursing, nurse practitioner students

Impacting Nursing Students' Confidence and Skills in Utilizing Continuous Glucose Monitoring Devices

Diabetes is increasing in prevalence in the United States (US). In 2020, over 11% of Americans had been diagnosed with type 1 or type 2 diabetes, and 8.7 million adults were unaware that they had diabetes (Centers for Disease Control and Prevention [CDC], n.d.). Diabetes is more common in rural areas, with a 17% higher prevalence of diabetes in rural areas compared to urban areas (Steiger et al., 2024). Additionally, there is a higher incidence of complications related to diabetes in rural areas.

Blood glucose monitoring has been recommended for patients with diabetes for many years as a standard of care (American Diabetes Association [ADA], 2025). Continuous glucose monitoring (CGM) provides a more reliable and convenient way for patients to check blood glucose levels than fingerstick monitoring, and it has been shown to improve glycemic control and decrease the risk of hypoglycemia (ADA, 2025). With CGMs, providers and patients receive immediate and retrospective blood sugar data which can be useful when recommending behavioral changes and therapeutic interventions (Unger et al., 2020). The latest data show that 50% of children with type 1 diabetes utilize CGMs, and this number is expected to increase in future years (ADA, n.d.-a). Similarly, more adult patients with type 1 and type 2 diabetes are now utilizing CGMs.

While overall CGM uptake is increasing, CGM usage remains low among adults with diabetes who belong to vulnerable populations (ADA, n.d.-b.). Lower income, older, and minority patients with diabetes are less likely to be prescribed CGMs. Access to CGMs remains unavailable for many adult patients due to disparities in prescribing. In 2022, patients with Medicaid who were

Hispanic or African American were less like to receive CGMs than other groups of patients (ADA, n.d.-b). In contrast, patients with commercial insurance were more likely to be prescribed CGMs (ADA, n.d.-b). In another study, prescribing of CGMs was low among patients with diabetes at federally qualified health care centers (FQHC), as well as patients who were Hispanic, African American, and those without insurance (Wallia et al., 2024). Because FQHCs provide care for many uninsured patients, as well as patients with Medicaid, there may be financial barriers to prescribing CGMs in this setting.

There are also geographic barriers to CGM usage. Patients with Medicaid in the Southeast US were less likely to receive CGMs than in other areas of the country (ADA, n.d.-b.). Tilden and colleagues (2024) found that children with type 1 diabetes in rural areas were less likely to complete a CGM-billed clinic visit, when compared to patients in urban areas. It is important to consider the values and challenges faced by patients in rural areas, and additional research is needed to determine the exact reasons for this difference. Mitchell and Huang (2024) discussed the need for equitable care for patients in rural areas, including the availability of CGMs as a modality of care. It is important for providers and clinics to provide financial and educational support so that patients in rural areas have the opportunity to utilize CGMs successfully (Mitchell & Huang, 2024).

Many rural residents lack access to endocrinology practices, so incorporating CGMs into primary care is important to increase patient access to this technology (Hall et al., 2025). Although the use of CGMs is recommended in primary care, adoption of this diabetes technology in non-specialty settings has been low. In a study of 200 nurse practitioners (NPs) in primary care settings, the majority reported a favorable opinion of CGMs (Hall et al., 2025). Primary care providers acknowledge the potential benefits of CGM but cite lack of knowledge, resources, and workload capacity as barriers to incorporating CGMs into practice (Vimalananda et al., 2025). Among nurse practitioners, future CGM prescribing was associated with CGM use in the past and the number of years since their educational training was completed (Hall et al., 2025).

Providing education about CGMs during health care training programs has been shown to be beneficial. In a study of rural family nurse practitioner (FNP) students, an educational workshop and a user-wear experience with CGMs resulted in increased familiarity and confidence in the use of CGMs (Phillips et al., 2024). Among pharmacy students, a hands-on workshop improved their confidence about CGMs, including knowledge about CGMs, awareness of the goals of CGMs, ability to provide patient education on the devices, and their skills in interpreting an Ambulatory Glucose Profile (Knezevich et al., 2023). In another study involving pharmacy students, wearing a CGM device for two weeks was associated with enhanced confidence and counseling skills related to CGMs (Folz et al., 2025). Similarly, among internal medicine residents, a CGM workshop with a user-wear experience improved their knowledge, confidence, and ability to answer questions about the use of CGMs (Marshall et al., 2025). Hands-on experiences can increase the confidence of future healthcare providers in prescribing and managing CGS.

Nurses must develop new knowledge and skills pertaining to the use and management of these devices, yet the educational training opportunities are inconsistent (March et al., 2020).

Virtual training of nurses resulted in increased knowledge about CGMs, so this may be a cost-effective way to provide education to nurses (Zimmerman et al., 2022). It may be beneficial to include education on CGMs during undergraduate nursing programs, so that nurses are competent to care for patients who utilize CGMs in primary, acute care, and school-based settings.

This education and hands-on experience could be particularly beneficial in rural areas where patients may not currently have access or exposure to CGMs. United States Census Bureau (n.d.) data reports reflected that in 2020, approximately 19.3% of the U.S. population was considered rural. Rural areas are defined as counties that are not considered to be urban or metropolitan with a population of less than 50,000 people (Health Resources and Services Administration [HRSA], n.d.). The educational experience in this study took place in a county with a documented population of 40,923 in July 2024, which qualifies as a rural location (U.S. Census Bureau, n.d.). Undergraduate registered nursing students and nurse practitioner students may also travel to and provide patient care in many of the surrounding counties which are also considered rural (U.S. Census Bureau, n.d.). Providing an educational opportunity in a rural county surrounded by other rural areas may provide benefits of new technology such as CGMs to healthcare workers and patients that may not previously have known about such options. The purpose of this project was to provide focused education about CGMs and a two-week user-wear experience to undergraduate nursing and family nurse practitioner students in a rural liberal arts university through an intraprofessional workshop and user-wear experience.

Study Design

This descriptive study consisted of an interactive educational CGM workshop with a pre- and post-survey design. Demographic data and ratings of students' familiarity and self-perception of skill in using CGMs were included in the pre- and post- surveys. Five open-ended questions about perceptions and experiences of the workshop session were included in the post-survey. The study received approval from the University's Institutional Review Board.

Participants and Setting

Students eligible for participation in the study and the CGM workshop/user-wear experience included those in the graduate FNP (n = 16) and undergraduate pre-licensure Bachelor of Science in nursing (BSN; n = 35) programs. Eligible graduate students were enrolled in the university's hybrid MSN-FNP or BSN-DNP/FNP programs and participated in the CGM workshop session to fulfill learning objectives for the first advanced practice clinical course. Eligible undergraduate students were in their final pre-licensure BSN clinical course, with the CGM session serving to incorporate clinical aspects of diabetes management with knowledge learned in the didactic portion of the undergraduate BSN courses. The BSN program is a 2 + 2 program where the first two years are comprised of general education and prerequisite requirements, and the last two years include nursing coursework. The undergraduate and graduate nursing programs are housed within a public, liberal arts university in the rural, Southeastern US.

The intraprofessional nature of the workshop involved an educational session about CGMs, wherein graduate FNP and pre-licensure BSN students were simultaneously engaged. Student participants had the opportunity to interact with students of a different educational level and to ask questions of and learn from the CGM presenter, nursing faculty, and other students. Students were required to attend the CGM workshop to fulfill course knowledge and competency requirements. However, students were not required to participate in the user-wear experience or complete the study pre- and post-surveys.

Materials and Methods

All eligible FNP and pre-licensure students (n=51) participated in the educational session. The in-person educational session, conducted during week 11 of the semester, lasted two hours and was led by a CGM manufacturer representative who was also an advanced practice provider. At the beginning of the CGM workshop, the 51 participating students were instructed to download the CGM application to their smartphone and asked to complete the pre-implementation survey. During the workshop, students and faculty were educated about the proper application of CGMs and given the opportunity to self-apply a CGM for a two-week user-wear experience. Students were educated on the technical aspect of applying a CGM, the use of smartphone applications connected to the device, and information about the impact of CGMs on diabetes control, lifestyle choices, and treatment decisions. During the two-week user-wear period, students were able to monitor their glucose levels, follow trends, and troubleshoot the device. While all 51 students were given the opportunity to participate in the user-wear experience, the researchers had no method to track whether students initiated or engaged with the device during the two-week period. At the close of the two-week user-wear experience, students were encouraged to complete the post-implementation survey by reminders sent to students through the university's learning management system. The post-survey link was deployed to all 51 students.

Survey Design/Data Collection

An online pre-implementation survey administered before the workshop and through the university's learning management system was used to collect demographic data and students' familiarity and self-perception of skill in using CGMs. General demographic variables of age, gender, race/ethnicity, years of clinical experience, and nursing program category were collected to determine characteristics of students between and among groups. Diabetes related characteristics/variables (recorded as yes/no responses) included: (a) knowledge of personal pre-diabetes status, (b) personal diagnosis of type 1 or 2 diabetes, (c) family member with a diagnosis of diabetes, and (d) previous training or experience with CGMs. Demographic and diabetes related variables were gathered to determine if certain student groups benefited more from the CGM education and experience than others.

The Continuous Glucose Monitor Knowledge and Skill Survey was deployed prior to the workshop. This pre-workshop survey included five items to assess student familiarity with CGMs and five items concerning student self-perception in performing certain tasks related to CGM

devices. The survey was created by the investigators and adapted from two previously published surveys that were used with permission (Sherrill et al., 2022; Wilson et al., 2013). Original content validity was established through experts in the field of Pharmacy, diabetes management, and academic/clinical education. Sherrill and colleagues (2022) designed the survey to evaluate Pharmacy students' perceived familiarity and skill with CGMs before and after an education module. Our research team adapted the questions to remove "Pharmacy" verbiage, which did not change the survey item content. Sherrill and researchers (2022) did not disclose reliability measures of the original survey.

The post-implementation survey was deployed two weeks after the workshop, which marked the end of the user-wear experience. The post-survey included the same questions as the pre-survey with the addition of five open-ended questions and an *additional comments* prompt to allow for student elaboration of their perceptions and experiences. The scored survey items and open-ended questions specifically asked about workshop experiences. There were no scored-items that addressed the user-wear experience. Thus, data were analyzed to determine the benefit of the workshop alone, rather than the workshop in conjunction with the user-wear experience. However, many students offered their feedback and perceptions of the user-wear experience in the additional comments section. The surveys were voluntary, anonymous, and completed independently; thus, no informed consent was necessary. Each survey took approximately ten minutes to complete and was not associated with a course grade for students in either the undergraduate BSN or graduate Nurse Practitioner programs.

Data Analysis

Data were analyzed using SPSS statistical packaging software version 31 (IBM Corp, n.d.). Ten survey items assessing familiarity and skill in the use of CGMs were scored using a 5-point Likert scale (Familiarity rating, 1- *strongly disagree* to 5 – *strongly agree;* Skill rating, 1— *no confidence* to 5 – *highly confident*). Item scores were reported as *medians* and were analyzed as ordinal data. Pre- and post- survey familiarity and skill responses were compared for statistically significant differences using Wilcoxon signed-rank tests with an alpha set at .05. The post-survey also included five open-ended questions to allow for student elaboration of perceptions and experiences with the CGM device. Chi-square analyses were performed to determine differences between student groups by demographic and diabetes-related variables (personal pre-diabetes status (yes/no), personal diagnosis of type 1 or 2 diabetes (yes/no), family member with a diagnosis of diabetes (yes/no), and previous training or experience with CGMs (yes/no). Kruskal-Wallis tests were performed to determine if there were differences in post-survey scores in terms of grouped age, years of clinical experience, and nursing program. Mann Whitney U tests were performed to determine if there were differences in post-survey scores in relation to diabetes-related variables.

Qualitative analysis of the open-ended responses was conducted within Microsoft Excel using directed content analysis (Bengtsson, 2016). The directed content analysis approach allows researchers to evaluate descriptive data with minimal interpretation or personal influence. Unlike focus group sessions where data is collected by verbally sharing experiences, direct content

analysis allows for examination of individual perceptions without peer influence. The written content can also be examined through an objective lens without adding prompts or leading questions that may appear in a semi-structured interview (Bengtsson, 2016).

Study investigators are also the nursing faculty members who conducted the CGM workshop and teach the associated nursing courses. The research team acknowledges the potential for bias when evaluating responses. However, the researchers attempted to limit the influence of personal experiences by bracketing and conducting separate initial analyses when evaluating the open-ended responses for emerging themes. One of the faculty team members performed the initial coding and identified high frequency words or nodes, followed by focused coding of presenting themes. A second team member followed this same process to code the data and to identify themes. The remaining team members reviewed both analyses. Any disagreements were discussed by all team members to determine the final themes. Some responses could have been appropriate for multiple categories or themes, particularly those addressing understanding and confidence pre- and post-workshop. All team members discussed these instances and categorized comments after agreement was met on theme determination.

Results

Student Characteristics

All 51 eligible students participated in the CGM workshop, and 49 (96%) completed the pre-implementation survey. All 51 students were offered the two-week user-wear experience, but the researchers had no method to track how many students initiated or engaged with the CGM for the full two weeks. Of the 51 eligible participants, 27 (52.9%) completed the post-survey and offered insights about the workshop and user-wear experience (Table 1). There was no tracking method or data available to determine if the 27 post-survey respondents also completed the two-week user-wear experience. However, many student responses in the "additional comments" section indicated the user-wear experience was beneficial and offered insights into issues such as alarm fatigue and technical difficulties patients may encounter when wearing the CGM device.

Of the 49 students who attended the educational session and completed the pre-implementation survey, 43 (87.8%) reported being female, 33 (67.3%) were White or Caucasian Race/Ethnicity, and 44 (89.8%) were between the ages of 18-35 years. This is typical of student demographics in the undergraduate BSN and graduate FNP nursing programs at the university and is representative of the demographic composition of the programs over the past 10 years. Approximately 78% of students reported having three years of clinical experience or less. Nursing program category totals included approximately 70% undergraduate BSN, 22% graduate FNP-MSN, and 8% graduate BSN-DNP (FNP). For diabetes-related variables, 3 (6.1%) students reported having pre-diabetes, zero had a diagnosis of type 1 or 2 diabetes, and 31 (63.3%) reported having a family member with diabetes. Approximately 25% reported previous experience with CGMs.

Table 1

Intracollaborative CGM Experience Student Demographics

Variable	Pre-Survey (n = 49), n (%)	Post-Survey (n = 27), n (%)
Gender		
Female	43 (87.8)	23 (85.2)
Male	5 (10.2)	3 (11.1)
Prefer not to say	1 (2.0)	1 (3.7)
Race/Ethnicity		
White/Caucasian	33 (67.3)	17 (62.9)
Black/African American	10 (20.4)	5 18.5)
Asian	1 (2.0)	1 (3.7)
Other/Prefer not to answer	5 (10.2)	4 (14.8)
Age		
18 – 25 years	32 (65.3)	17 (63.0)
26 – 35 years	12 (24.5)	9 (33.3)
36 – 45 years	4 (8.2)	0 (0.0)
Prefer not to answer	1 (2.0)	1 (3.7)
Clinical Work Experience		
None	4 8.2)	2 (7.4)
< 1 year	6 (12.2)	2 (7.4)
1 – 3 years	28 (57.1)	15 (55.6)
4 – 6 years	6 (12.2)	6 (22.2)
7 – 10 years	3 (6.1)	2 (7.4)
> 10 years	2 (4.1)	0 (0.0)
Nursing Program		
BSN Program	34 (69.4)	15 (55.6)
MSN FNP Program	11 (22.4)	9 (33.3)
BSN-DNP Program	4 (8.2)	3 (11.1)
Do you have pre-diabetes		
Yes	3 (6.1)	1 (3.7)
No	46 (93.9)	26 (96.3)
Do you have Type 1 or II DM		
Yes	0 (0)	0 (0)
No	49 (100)	27 (100)
Family member with DM		
Yes	31 (63.3)	21 (77.8)
No	18 (36.7)	6 (22.2)
Previous training or experience with CGMs		
Yes	12 (24.5)	8 (29.6)
No	37 (75.5)	19 (70.4)

Bachelor in Science in Nursing (BSN), Continuous Glucose Monitor (CGM), Diabetes Mellitus (DM), Doctor of Nursing Practice (DNP), Family Nurse Practitioner (FNP), Master of Science in Nursing (MSN).

Familiarity and Skill with CGM Devices

All 10 scored survey items (Q1 to Q10) measuring student familiarity and perception of skill with CGM devices had statistically significant differences in pre- and post-survey ranked scores (Table 2). Students reported increased familiarity with CGM operation, informatics, and types of available devices (Q1-Q3), device management and data modeling skills (i.e., creating individualized treatment plans based on data trends) (Q3-Q4), collecting a patient history with CGM use consideration (Q5), and placement of CMGs after the educational intervention (Q1, Q3, and Q6) (pre-survey *Mdn* = 3.0, post-survey *Mdn* range = 4.0-5.0, *z- score* range -4.07-3.70, *p-values* <.001). Students also reported improved confidence in counseling patients on device use (Q7), training and education of other staff on device function and use (Q8), and in results, analysis, and making therapeutic modification recommendations (Q9 – Q10) (pre-survey *Mdn* range = 2.0-3.0, post-survey *Mdn* range = 4.0-5.0, *z- score* range -4.20 – -3.04, *p-values* < .001-.002).

Chi square analyses revealed no significant differences between groups by age (18 - 35 years versus 36 years and older,) clinical work experience (1-3 years versus 4 years or more), presence of pre-diabetes (yes/no), diabetes in a family member (yes/no), and previous training or experience with CGM devices (yes/no), all *p-values* >.05. Kruskal-Wallis test (for program type) and Mann Whitney *U* tests (for bivariate groups) determined no statistical differences between post-survey group scores. This analysis students who reported some previous CGM experience. Those respondents had similar familiarity and skill scores as those without previous experience. Thus, demonstrating the workshop was beneficial for all groups regardless of previous reported experience.

Table 2

CGM education and user-wear experience survey responses (N=27)

Subscale/Item	Pre-experience *Median*	Post-experience *Median*	*Z*-Score	*P*-value
Familiarity with CGM Devices				
I am familiar with….				
The operation of continuous glucose monitoring systems and associated informatics	3.00	5.00	-4.07	<.001
The various continuous glucose monitoring systems that are commonly available	3.00	4.00	-4.07	<.001
I can demonstrate….				
Basic continuous glucose monitoring system management skills	3.00	5.00	-3.70	<.001
Basic knowledge of continuous monitoring system informatics and data modeling	3.00	5.00	-4.00	<.001
I can complete….				
A patient history on a patient using a continuous glucose monitoring system device	3.00	5.00	-3.92	<.001

Skill with CGM Devices ***Rank your confidence in your ability to perform the following tasks related to CGM devices***				
CGM placement	3.00	5.00	-4.15	<.001
Patient counseling on device use	3.00	5.00	-4.08	<.001
Provider education to other staff	3.00	5.00	-4.20	<.001
Results, analysis, and therapeutic modification recommendations	3.00	5.00	-3.96	<.001
Dispensing and insurance billing	2.00	4.00	-3.04	.002

analyzed using Wilcoxon signed-rank testing

Open-Ended Responses

Students provided additional feedback on their insights and participation in the CGM educational session through the completion of five-open ended questions. Many students offered insights and perceptions of the two-week user-wear experience in the "additional comments" section (Table 3).

Table 3

Post-Survey Open-Ended Questions

- What were your perceptions of continuous glucose monitoring before the workshop?
- How did your perceptions and understanding of continuous glucose monitoring change after attending the workshop?
- How did the continuous glucose monitoring workshop help to prepare you for clinical experiences?
- What do you feel needs to be changed about the continuous glucose monitoring workshop?
- Are there any challenges that you foresee in implementing continuous glucose monitoring with patients?
- Additional comments:

Review of the responses revealed four themes: understanding, confidence, personal experience, and clinical preparation (Table 4). A lack of understanding was identified as a common theme prior to the educational session and user-wear experience. One student response reported, "I had little knowledge on CGMs or how they functioned." Student responses identified an increased understanding after the interactive workshop and user-wear experience. One response stated, "I now understand how the CGM monitoring works and how helpful it is". Another student reported "I now understand how to wear and how to interpret the info from a CGM". Student responses also demonstrated a lack of confidence prior to the educational session. A student stated, "I was unsure of how it worked exactly." Confidence levels increased after the in-person, interactive education. Students stated, "I felt more confident to be able to help patients with their CGM," and "I'm definitely more confident now in teaching and understanding the trends." BSN and FNP students also identified themes of personal experience and clinical preparation. One student stated, "I can personally tell patients that I have put one on myself," while another reported "I really enjoyed this experience and being able to track and look into my blood glucose throughout the day. This was an extremely informative experience." Another student responded, "It helped me

to understand how it works from a personal standpoint since I was able to wear one myself. I can now understand...patients...better that wear a CGM." Students were better prepared for CGM use with patients and were able to apply the knowledge gained through the experience in the clinical setting. After the experience a student stated, "I feel like this has prepared me better to educate patients who wear a CGM and provide information," while another student stated, "this will help me by being able to answer any questions a patient may have." One student had personal clinical experience with a patient and CGMs and stated the experience was "very informative. I was able to provide a patient in the clinical setting who was hesitant about the device at first some information, and they made the decision to try it out." Open-ended responses did identify potential technology challenges. Students reported the "challenge of alarm fatigue" from frequent alarms in the night, and another stated "if the patient does not know how to use or work with technology (such as an elderly patient), it may prevent them from using the device correctly."

Table 4

Open-Ended Response with Coding Scheme

Student Response	Code/Node	Category	Theme
"I had little knowledge on CGMs or how they functioned." "I was unsure of how it worked exactly."	Lack of understanding of CGMs	Preworkshop lack of understanding	
"I now understand how the CGM monitoring works and how helpful it is." "I now understand how to wear and how to interpret the info from a CGM."	More understanding of CGMs after workshop	Postworkshop understanding	Understanding
"I felt more confident to be able to help patients with their CGM."	Lack of Confidence with CGMS		
"I am definitely more confident now in teaching and understanding the trends."	Increased confidence with CGM	Postworkshop confidence	Confidence
"I can personally tell patients that I have put one on myself." "It helped me to understand how it works from a personal standpoint since I was able to wear one myself. I can now understand…patients…better that wear a CGM."	Individual experience with CGM.	Hands on experience	Personal experience
"I really enjoyed this experience and being able to track and look into my blood glucose throughout the day. This was an extremely informative experience."	Individual experience with GCM data	Experience interpreting CGM data	Personal experience
"I feel like this has prepared me better to educate patients who wear a CGM and provide information." "This will help me by being able to answer any questions a patient may have." "I was able to provide a patient in the clinical setting who was hesitant about	Preparation for application in clinical practice	Improved clinical preparedness with CGM	Clinical preparation

Student Response	Code/Node	Category	Theme
the device the at first some information, and they made the decision to try it out."	Application to clinical practice		

Conclusion

The intraprofessional CGM workshop allowed undergraduate BSN and graduate FNP students to engage with each other in a clinical and experiential learning activity to improve their understanding, confidence, and skills in diabetes management with CGM devices. Students from all included programs (undergraduate BSN, graduate MSN-FNP and graduate BSN-DNP FNP) reported improved self-perception of confidence and skills in using CGMs after the workshop, with all 10 survey items demonstrating statistical significance. Post-hoc analysis demonstrated the educational intervention was beneficial for students regardless of age, clinical experience, or familiarity with diabetes through personal or family members' diagnoses. Furthermore, students who had some experience with CGMs before the workshop reported learning valuable information after having first-hand user-wear exposure. The interprofessional approach served to bring energy, enthusiasm, and collaboration to the learning experience. Overall, the CGM workshop assisted students to become more familiar and confident in the use of CGMs and to engage with the CGM representative, nursing program faculty, and students from different levels of nursing education. Anecdotal feedback from students about the collaborative learning approach was overwhelmingly positive, with students voicing satisfaction with the session and experience. There were opportunities for both groups of students to interact, and some of the senior undergraduate students expressed an interest in the FNP program after this experience.

Analysis of the open-ended survey responses supported students' verbal acknowledgment of positive perceptions of the CGM workshop and user-wear opportunity. There were four themes: understanding, confidence, personal experience, and clinical preparation. The CGM workshop enhanced the knowledge and confidence of undergraduate BSN and graduate FNP students about CGMs, which are being used more frequently in healthcare settings. Vimalananda and colleagues (2025) assert that a lack of knowledge about CGMs is a barrier to their utilization by providers. Similarly, March and researchers (2020) discuss the need for nurses to learn more about CGMs and their management. Therefore, it is crucial that both undergraduate and nurse practitioner students gain familiarity with CGMs through workshops and hands-on activities, especially in rural areas where CGM use is not optimized (Mitchell & Huang, 2024).

Limitations of the study include a small sample size of nursing students during one semester at a single university. Surveys were anonymous and voluntary, and the post-implementation survey was sent to students after the two-week user-wear experience. The two-week time period between surveys likely resulted in a lower response rate (53%) on the post-survey when compared to 96% on the pre-survey. Additionally, there was no way to determine which students completed the two-week user wear experience, as compared to those who did not participate at all or only participated for a portion of the user-wear experience.

The CGM workshop and user-wear experience enhanced both the undergraduate BSN and graduate nurse practitioner students' confidence in the use of CGMs at no additional cost to the nursing program. It is necessary for nursing students to attain knowledge, skills, and familiarity with CGMs to ensure that they are competent and prepared for clinical practice after graduation. It is important for nursing programs in rural areas to expose their students to CGMs, so that more equitable use of CGMs can be achieved in rural settings where there is a higher incidence of diabetes.

Conflict of Interest

The authors declared no conflict of interest, financial or otherwise.

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