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Redesigning Hospital Diabetes Education: A Qualitative Evaluation with Nursing Teams

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Abstract

Background—Methods to deliver diabetes education are needed to support patient safety and glycemic control in the transition from hospital to home.

Purpose—This study examined barriers and facilitators of integrating web-based, iPad™ delivered diabetes survival skills education (DSSE) into the nursing inpatient unit workflow.

Methods—Nurses, nurse managers, and patient care technicians (PCT) from 3 medical-surgical and 2 behavioral health units participated in semi-structured interviews and focus groups.

Results—Four themes emerged: educational program and content; platform usability; tablet feasibility (eg, theft prevention, infection control, charging); and workflow considerations. Behavioral health unit-specific concerns were also identified. Findings indicated that nurses and PCTs were eager to find approaches to deliver DSSE.

Conclusions—Implementation of a web-based DSSE program for inpatients needs adaptation to overcome challenges at the patient, care team, and process levels.

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Key terms

Diabetes Education; Diabetes Mellitus; Type 2; Focus Groups; Inpatients; iPad™; Workflow

Diabetes mellitus is a complex chronic disease with an increasing prevalence. In the United States, approximately 30 million Americans over 18 years of age, representing 9.4% of the population, have diabetes; 95% of these have type 2 diabetes mellitus (T2DM).¹ The burden of diabetes on the patient and the healthcare system is significant. In 2014, there were 7.2 million hospitalizations and 14.2 million emergency department visits for adults with a diabetes diagnosis, and in 2015, diabetes was the seventh leading cause of death in the U.S.¹ Diabetes self-management education and support (DSMES) is critical to reduce the burden of disease on the patient and healthcare system, as well as enhance patient quality of life and clinical outcomes.² DSMES is defined as the “ongoing process of facilitating the knowledge, skill, and ability necessary for diabetes self-care.”³ Effective delivery and patient uptake of DSMES has been demonstrated to improve outcomes for patients living with T2DM. This includes improvement in hemoglobin A1C, reductions in complications, and adoption of healthy lifestyle behaviors including dietary and physical activity improvements.^{4–6} Despite the demonstrated effectiveness of diabetes self-management education and support, fewer than 50% of patients with a diabetes diagnosis receive diabetes education.⁷ Research confirms that less than 5% of newly diagnosed Medicare beneficiaries use their DSMES benefits.⁸ Innovative approaches for reaching patients with T2DM and exposing them to DSMES are required for optimal outcomes on a population health scale.

Traditionally, DSMES was designed to be provided in the outpatient setting by primary care practices or in collaboration with endocrinologists.⁵ Diabetes survival skills education (DSSE) is a key component of DSMES and is defined as the process of facilitating the core knowledge, skills, and ability necessary for safe and effective diabetes self-care in the short term. The goal of DSSE is to keep patients stable during transitions of care (eg, from hospital to home) and for patients with T2DM to be able to recognize when their blood glucose control needs timely attention (eg, hypo or hyperglycemic events). The transition period between hospital and home for patients with T2DM has been associated with significant adverse patient events, including preventable medical errors and rehospitalizations.⁹ The inpatient hospital setting may be an important opportunity to provide patients with DSSE to support this transition and to prepare them for the more comprehensive DSMES conducted in outpatient settings.

Several reports have suggested that DSSE delivered in the hospital setting can impact outcomes. In a small pilot study of diabetes education for hospitalized patients with T2DM, nurse-delivered DSSE improved patient hospital treatment satisfaction, and patients had lower mean discharge blood glucose compared to usual care controls.⁷ Another study of hospitalized patients with T2DM found that DSSE improved diabetes knowledge and medication adherence. These improvements were sustained up to three months after hospital discharge.¹⁰ In many cases, DSSE in the hospital may represent the only diabetes education that a patient receives. The Joint Commission and the American Diabetes Association Standards of Care suggest that all inpatients receive diabetes education prior to hospital

discharge.² Fitting standardized DSSE into the workflow of busy inpatient units using existing staff presents many challenges. Sustainable and scalable strategies are needed to support hospital nursing units in effective delivery of standardized diabetes survival skills education to all patients with diabetes.

Aims

The aim of the current study was to examine potential barriers and facilitators of integration of a web-based, tablet-delivered, adaptive learning DSSE program (*Diabetes to Go*) into nursing workflow on inpatient medical-surgical and behavioral health units. Strategies for overcoming identified implementation challenges were explored.

METHODS

Design

We conducted a series of focus groups with nurses, nurse managers, and patient care technicians (PCTs) to examine potential barriers and suggested facilitators of implementing a DSSE program into nursing unit workflow. This research was approved by the Institutional Review Board (IRB). Each volunteer was consented prior to focus group participation. A waiver of documentation of informed consent was granted by the IRB for this study. Focus groups were conducted using semi-structured interview methods to examine current processes for delivering DSSE on inpatient units, current DSSE content for patients, perceived barriers to nursing unit staff delivery of DSSE at the bedside using a tablet-delivered platform, and ideas about how a tablet-delivered education program might be integrated into workflow. Facilitator guides were developed to support neutrality and generate an open discussion among participants. Open-ended questions and probes were structured for flexibility, allowing for emerging themes, trends, and strategies to be explored.

Sample/Participants

Nurses, nurse managers, and PCTs, who provide ancillary unit support, from three medical-surgical units and two behavioral health units within a large urban, tertiary care medical center in Washington, DC, volunteered to participate in the focus groups. The units were selected from those with high census numbers for adult patients with T2DM. The focus groups occurred over a 4-week period in the fall of 2016.

Diabetes to Go – Program Description

The *Diabetes to Go* program provides an adaptive learning approach to delivering DSSE and has previously been tested to demonstrate effectiveness at improving medication adherence in patients with T2DM.¹⁰ The program is delivered in English on a web-enabled device. Patients first log into the delivery platform and complete a 15-item validated survey to assess their knowledge of diabetes survival skills. Responses to the individual survey questions are then used to direct patients to video content based on their personal knowledge deficits. The program also includes mandatory video content. Videos range in length from 3 to 6 minutes. The delivery platform records patients' answers to the survey questions and the videos they view.

Data collection

Focus groups were conducted within the hospital at a conference room location convenient for the participants and at varying times of day and days of the week by two of the investigators. Separate focus groups for each target stakeholder group (nurses, PCTs, and nurse managers) were held to ensure openness in responses. A total of five groups were conducted to allow for scheduling, inclusiveness and maximization of participants. With the participants' knowledge and consent, the sessions were audio-recorded, and both interviewers took extensive notes. Notes were compared immediately following completion of each group session and validated with the audio recording if discrepancies between the interviewers' observations were noted. We also interviewed two super-users of *Diabetes to Go* in the outpatient setting to gain further insight on the model, particularly around implementation challenges and facilitators.

Each 1-hour focus group started with an introduction to the project team, the goals of the project, and a few warm-up questions aimed at establishing a rapport with the participants. One of the interviewers provided a brief introduction to the tablet-delivered *Diabetes to Go* education program. Feedback specifically related to tablet usability, functionality, perceived data and monitoring needs, as well as education content, was solicited. Implementation challenges emerging during the focus groups were probed for suggested potential solutions as were strategies to support effective workflow integration.

Evaluation

Information collected during the focus groups was thematically analyzed by 2 researchers. Data were analyzed after each focus group by inductively categorizing, coding themes, delineating categories and connecting them to construct an evolving model of DSSE integration into nursing workflow. Information from each focus group was discussed and interpretations of the implicit and explicit themes were compared with prior focus group categories. This process established boundaries of each category and aided in identifying inter-relationships between themes. Data were presented to the project team members for consensus and validation of the themes and to define the model for sustainable implementation of the Diabetes to Go DSSE program into nursing unit workflow.

RESULTS AND DISCUSSION

Overall, stakeholders were enthusiastic about enhancing the effectiveness of diabetes education for their patients. Four common themes emerged from the focus groups: educational content issues, platform usability, tablet feasibility, and workflow considerations. These are summarized in Supplemental Digital Content, Figure. In addition, it was apparent that factors specific to tablet-delivered DSSE on behavioral health units are unique.

Strong concordance among stakeholder groups was reported for all factors discussed. The only discordant factor was between nurses and PCTs on which group could appropriately deliver DSSE. Nurses reported that while PCTs could help in the process, eg, by delivering a tablet and facilitating its use with patients, the responsibility for DSSE remains with nurses.

PCTs, however, were interested in playing a greater role in the education process for “their” patients.

Educational content

There were several concerns about the educational content; these are summarized in Table 1. First, participants were concerned that the content would not be accessible to many patients due to the relatively high literacy and health literacy levels of the written materials. Health literacy is a critical consideration for the development and deployment of self-management education for all patients with chronic disease.¹¹ In examining the *Diabetes to Go* DSSE program, stakeholders identified health literacy concerns with patients understanding the educational content. This concern of the mismatch of the complexity of health information presented to patients and the patients’ health literacy skills is supported in the literature. Rowlands et al. reported that of the health materials for adults they reviewed, 43% of text-only, and 61% of text and numeracy materials exceeded the health literacy of their adult working-age population (N=5795; aged 16–65 years). Since low health literacy is associated with higher medical services utilization, greater difficulties in managing chronic illnesses, lower general health, and higher mortality,^{12,13} every attempt to enhance access and literacy of health promotion materials, including DSSE, is critical.

Second, participants were concerned about the lack of availability of the materials in any language other than English, since many of their patients do not speak or read English. Based on their patient population, they proposed that translation of the materials to Spanish, Amharic, French, and Chinese, among others, would be beneficial. Additional design effort would be required to integrate existing translation services into the process.

Third, participants were concerned that the videos were too long. They were encouraged that the education can be presented as modules so that patients can work through discrete modules at different times depending on their available time, attention, and wellness level. Participants also suggested that education intended to engage family members would be beneficial in addition to the patient education.

Finally, participants reported a need for their own better understanding of what to teach patients about diabetes survival skills. Similar to other published studies, nurses in our project agreed that educating patients about diabetes was an important part of their workflow and reported challenges to implementing this routinely.¹⁴ The surveyed nurses expressed a need for education to guide them as to what to teach patients about diabetes before hospital discharge. This is consistent with a robust literature on nurses’ knowledge of diabetes, which suggests a wide variation in nurses’ understanding of diabetes.^{15,16} The nurse participants stated that they currently rely heavily on certified diabetes educators for patients who are newly diagnosed or unit level diabetes resource nurses for complex patients, but these resources are often limited.

Participants also reported that there was little existing standardization in DSSE delivered to patients across different units and by different nurses within a nursing unit. Moattari et al.¹⁷ examined the impact of a web-based diabetes training program for nurses and found that the training improved knowledge and competence for diabetes care. The study, however, did not

focus on nurses' confidence or competence in conveying this information effectively to patients. Our findings suggest that a tailored curriculum for nurses should focus on *what* to teach patients about their diabetes in the inpatient setting and that tools to support translation of knowledge into practice would be beneficial.

Platform usability

The *Diabetes to Go* educational content is intended to be delivered to patients on a tablet through a web-based platform. Participants identified several concerns with using a technology-based platform to deliver education. These concerns and potential solutions are summarized in Table 2.

Multiple nurses and PCTs estimated that no more than half of their patients could navigate the tablet-delivered education independently. This is due not only to the literacy and language barriers discussed above, but also to physical disabilities, lack of technology experience, and lack of interest in using technology. A study examining iPad™-based warfarin education for inpatients found that patients who were under 65 years reported higher satisfaction (92.9% vs 58.3%) with the iPad™ compared to those 65 years or older.¹⁸ Similarly, a study of tablet-based education for patients with COPD demonstrated that few elderly patients were able to independently navigate the breathing exercises on the tablet.¹⁹ Both of these studies had small sample sizes but suggest that additional attention is needed to support usability when developing tablet-based education for older patients.

Stakeholders also thought that the tablet-based education might not meet the learning needs of many patients, and that alternative formats for program delivery should be available to accommodate different learning styles (eg, paper, DVD, or patient education channel integration). Based on the demonstration of the existing *Diabetes to Go* platform, participants also questioned the usability of the patient interface (eg, font size seemed too small) and the nursing interface (eg, it is difficult to determine patients' progress through the education).

Tablet feasibility

Participants identified logistical challenges in using a tablet on a hospital unit, which are summarized in Table 3. These include the need to reliably clean the tablet between patients for infection control, protection from theft, and charging and storage requirements. Although only a handful of studies have examined the feasibility of tablet-based education delivery for inpatients, the concerns raised in the focus groups were similar to reports in the literature where standardized processes for loss protection of electronic devices and development of new cleaning procedures for patient-facing devices were required.^{20,21} In one study, it was determined that the optimal approach to ensuring loss protection, infection and transmission prevention, and charging of the device was to have a device dedicated for each patient room.²⁰ However, with an estimated per iPad cost of \$600, a cost benefit analysis would be needed to justify providing one to each patient room. In addition, nurse participants expressed the need to monitor, track, and record patients' progress through the educational content, which could be logistically difficult if the education is delivered via tablet rather than in person.

Workflow considerations

Participants identified numerous considerations for integrating web-based, tablet-delivered DSSE into standard nursing workflow; these considerations are listed in Table 4. Of primary concern is the lack of time to provide the education. This is due to the existing workload for unit staff, both nurses and PCTs, and to the reduced time patients are in the hospital because of pressures for shortening length of stay. The variability of resources within and across units, which contributes to workload, is also a consideration.

According to the focus group participants, there is a lack of standardization around the timing of current education for inpatients. Consistent with this, Rodriquez et al.²² reported that fewer than 25% of hospitals had standardized protocols for patient diabetes education and follow-up after hospitalization. Care team members in our study identified that discharge may not be the optimal time within the inpatient stay to provide education, although this was part of their current workflow. Survival skills education is often coupled with discharge, prompted solely by printouts from the electronic health record (EHR). Nurses felt strongly that a standing order for diabetes education in the EHR, along with a standing task in the nurse's task list would help support standardized integration with nursing workflow. The lack of integration with the EHR is also considered a barrier because it results in additional work for the staff. The education is an additional system to log into and manage, and any documentation must be manually transferred from the education system to the EHR.

Considerations for Behavioral Health Units

In addition to the challenges above, unique challenges for tablet-delivered DSSE on behavioral health units were identified. While education is a cornerstone for patients with diabetes to enhance self-management, the literature on diabetes education for patients with both mental health and T2DM diagnoses is sparse and has predominantly focused on outpatient interventions. All behavioral health stakeholders had concerns with having patient-facing tablets on their unit. Specifically, nurses, nurse managers, and PCTs all raised concerns about inappropriate use of the tablet by patients, including accessing the internet and/or the potential for the tablet to be used as a projectile, creating an unsafe condition for both patients and the care team.

Stakeholders were also concerned that the adaptive learning approach would not work for all patients within the behavioral health units. Participants offered several suggestions for DSSE, including integrating the *Diabetes to Go* content into their educational group schedule, stating that group education was preferred to tablet-delivered. Multiple studies have suggested that group education for diabetes self-management was effective in the outpatient arena.²³ Further exploration of appropriate approaches for education within inpatient behavioral health units will be an important and much needed contribution to the literature. Other suggestions from focus group participants included a DVD and a paper booklet on DSSE. Participants also recommended providing DSSE to all patients, not just those with a diagnosis of T2DM. This recommendation stems from issues with food sharing, which is common on the units.

Limitations

While the participants in this study represented 5 inpatient units, including both medical-surgical and behavioral health units, the study was conducted in a single hospital; this is the primary limitation of the study. Expansion to other sites may have resulted in the identification of additional barriers and facilitators.

CONCLUSION

Challenges and opportunities exist for integrating tablet-delivered DSSE into nursing unit standard nursing care workflow on inpatient units. Prior studies have focused on research implementation rather than pragmatic integration into workflow. Strategies for pragmatic implementation are needed, and the strategies must address key factors in each of the domains critical to program design and implementation: educational content, platform usability, tablet feasibility, and workflow integration. Challenges differ for medical-surgical and behavioral health units, thus DSSE for each of these populations should be considered separately.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

1. Centers for Disease Control. National Diabetes Statistics Report, 2017. Atlanta, GA: 2017. <https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf> [Accessed January 10, 2018]
2. Armstrong C. ADA Updates standards of medical care for patients with diabetes mellitus. *Am Fam Physician*. 2017; 95(1):40–43. [PubMed: 28075100]
3. Beck J, Greenwood DA, Blanton L, et al. 2017 National standards for diabetes self-management education and support. *Diabetes Educ*. 2017; 43(10):1409–1419.
4. Chryala CA, Sherr D, Lipman RD. Diabetes self-management education for adults with type 2 diabetes mellitus: A systematic review of the effect on glycemic control. *Patient Educ Couns*. 2016; 99:926–943. [PubMed: 26658704]
5. Powers MA, Bardsley J, Cypress M, et al. Diabetes self-management education and support in type 2 diabetes: A joint position statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. *J Acad Nutr Diet*. 2015; 115(8):1323–1334. [PubMed: 26054423]
6. Magee M, Bowling A, Copeland J, Fokar A, Pasquale P, Youssef G. The ABCs of diabetes: diabetes self-management education program for African Americans affects A1C, lipid-lowering agent prescriptions, and emergency department visits. *Diabetes Educ*. 37(1):95–103.

7. Korytkowski MT, Koerbel GL, Kotagal L, Donihi A, DiNardo MM. Pilot trial of diabetes self-management education in the hospital setting. *Prim Care Diabetes*. 2014; 8(3):187–194. [PubMed: 24387916]
8. Strawbridge LM, Lloyd JT, Meadow A, Riley GF, Howell BL. One-year outcomes of diabetes self-management training among medicare beneficiaries newly diagnosed with diabetes. *Med Care*. 2017; 55(4):391–397. [PubMed: 27753746]
9. Donihi AC. Practical recommendations for transitioning patients with type 2 diabetes from hospital to home. *Curr Diab Rep*. 2017; 17(7):52. [PubMed: 28573408]
10. Magee MF, Khan NH, Desale S, Nassar CM. *Diabetes to Go*: Knowledge- and competency-based hospital survival skills diabetes education program improves postdischarge medication adherence. *Diabetes Educ*. 2014; 40(3):344–350. [PubMed: 24557596]
11. Rowlands G, Protheroe J, Winkley J, Richardson M, Seed PT, Rudd R. A mismatch between population health literacy and the complexity of health information: an observational study. *Br J Gen Pract*. 2015; 65(635):e379–86. [PubMed: 26009533]
12. Berkman ND, Sheridan SL, Donahue KE, Halpern DJ, Crotty K. Low health literacy and health outcomes: An updated systematic review. *Ann Intern Med*. 2011; 155(2):97. [PubMed: 21768583]
13. Bostock S, Steptoe A. Association between low functional health literacy and mortality in older adults: longitudinal cohort study. *BMJ*. 2012; 344:e1602. [PubMed: 22422872]
14. Krall JS, Donihi AC, Hatam M, Koshinsky J, Siminerio L. The Nurse Education and Transition (NEAT) model: educating the hospitalized patient with diabetes. *Clin Diabetes Endocrinol*. 2016:1–6. [PubMed: 28702237]
15. Alotaibi A, Al-Ganmi A, Gholizadeh L, Perry L. Diabetes knowledge of nurses in different countries: An integrative review. *Nurse Educ Today*. 2016; 39:32–49. [PubMed: 27006032]
16. Gerard SO, Griffin MQ, Fitzpatrick J. Advancing quality diabetes education through evidence and innovation. *J Nurs Care Qual*. 2010; 25(2):160–167. [PubMed: 19851121]
17. Moattari M, Moosavinasab E, Dabbaghmanesh MH, Zarifsanaiey N. Validating a web-based diabetes education program in continuing nursing education: knowledge and competency change and user perceptions on usability and quality. *Journal of Diabetes & Metabolism Disorders*. 2014; 13:1–8.
18. Kim JJ, Mohammad RA, Coley KC, Donihi AC. Use of an iPad to provide warfarin video education to hospitalized patients. *J Patient Saf*. 2015; 11(3):160–165. [PubMed: 24522209]
19. Chan H-Y, Dai Y-T, Hou I-C. Evaluation of a tablet-based instruction of breathing technique in patients with COPD. *Int J Med Inform*. 2016; 94:263–270. [PubMed: 27573335]
20. Dykes PC, Stadel D, Dalal A, et al. Strategies for managing mobile devices for use by hospitalized inpatients. *AMIA. Annu Symp proceedings AMIA Symp*. 2015; 2015:522–531.
21. Sawyer T, Nelson MJ, McKee V, et al. Implementing electronic tablet-based education of acute care patients. *Crit Care Nurse*. 2016; 36(1):60–70. [PubMed: 26830181]
22. Rodriguez A, Magee M, Ramos P, et al. Best practices for interdisciplinary care management by hospital glycemic teams: Results of a Society of Hospital Medicine survey among 19 U.S. hospitals. *Diabetes Spectr*. 2014; 27(3):197–206. [PubMed: 26246780]
23. Steinsbekk A, Rygg L, Lisulo M, Rise MB, Fretheim A. Group based diabetes self-management education compared to routine treatment for people with type 2 diabetes mellitus. A systematic review with meta-analysis. *BMC Health Serv Res*. 2012; 12(1):213. [PubMed: 22824531]

Table 1

Educational Content

Perceived Barriers	Potential Solutions
Literacy/Health literacy	Reviewed and adapted the educational content for patients with low literacy/low health literacy.
Language	Consider translating educational materials into languages other than English, particularly Spanish, or provide integration of translation services into process design.
Length of videos	Shortened videos.
Education for families	Consider making educational materials available to family members in addition to patients.
Lack of standard nursing education	Develop curriculum for nurses on diabetes survival skills and what patients need to know.

Table 2

Platform Usability

Perceived Barriers	Potential Solutions
Patient vision and motor skills	Provide alternative formats for program delivery, eg, DVD, integration on the patient education TV channels, or print format.
Patient comfort with technology	Provide alternative formats for program delivery. Apply user-centered design principles and conduct usability testing to improve usability of patient interface to make it more intuitive, particularly for patients who are reluctant to use technology.
Patient learning preference	Provide alternative formats for program delivery.
Patient interface usability	Apply user-centered design principles and conduct usability testing to improve usability of patient interface.
Nursing interface usability	Apply user-centered design principles and conduct usability testing to improve usability of nursing interface.

Table 3

Tablet Usability

Perceived Barriers	Potential Solutions
Infection control	Include standard cleaning protocols in implementation process.
Theft protection	Consider how to secure the tablet from loss.
Charging and storing	Include charging and storing protocols in the implementation process.
Tracking Patient Progress	Ensure a way for nurses and care team to track patient progress through the educational content and to see results (to inform areas needing additional attention prior to discharge). A dashboard and/or integration with EHR recommended.

EHR, electronic health record

Table 4

Workflow Considerations

Perceived Barriers	Potential Solutions
Time to provide education	Ensure that implementation process can accommodate minimal staffing time available and short patient stays.
Variable resources (eg, staffing ratios for nurses and PCTs, tablet availability, variable length of patient stay)	Ensure that implementation process is adaptable for units with variable resources.
Timing to provide education	Standardize processes for education delivery on units throughout hospital. Add a standing order for diabetes education in the EHR. Add a standing task in nurse's task list to provide diabetes education.
Lack of integration with the EHR	Pursue integration of the education platform with EHR.

EHR, electronic health record