

Title page: Meeting the challenges posed by an escalating diabetes healthcare burden: a mixed methods study.

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ABSTRACT

Aims and objectives: To identify innovative new strategies to maintain optimal care for patients with diabetes while in hospital.

Background: The ongoing escalation in the incidence of diabetes is contributing to a growing burden associated with diabetes management.

Design: Mixed methods underpinned by Appreciative Inquiry.

Methods: Online survey (n=173) and focus group interviews with nurses and midwives (n=40), and individual interviews with recently discharged hospital patients (n=6).

Results: Suggest a need for further education and knowledge on diabetes management for nursing, midwifery, medical and ancillary staff. This, together with improved communication and team work, is required to prevent delays in prescribing and reviewing insulin requirements, along with timely access to appropriate food for people with diabetes.

Conclusions: In seeking solutions to the challenges in caring for hospitalised patients with diabetes there is a need to work across the entire hospital workforce and to develop effective and efficient methods for ensuring appropriate skills and knowledge of diabetes management for staff across complex and rapidly changing hospital systems.

Relevance to clinical practice: The introduction and implementation of innovative educational and organisational strategies are needed to assist in meeting the challenges posed by an escalating diabetes healthcare burden. The safety of patients with diabetes can be optimised with the timely availability of appropriate meals and snacks, and enhanced coordination and communication between and within multidisciplinary teams.

What is already known about this topic:

1. Diabetes is often diagnosed as a secondary diagnosis, with diabetic patients spread throughout hospitals, meaning that all nursing and medical staff require current knowledge of diabetes management.
2. Hospitalised patients with diabetes are more likely to have poorer prognoses and longer lengths of hospital stay than patients without diabetes, but with the same primary diagnoses.
3. Adverse outcomes experienced by inpatients with diabetes are often associated with sub-optimal inpatient care.

What this paper adds:

1. There is a need for the availability of ongoing and up-to-date diabetes education for hospital staff, and this should be flexibly delivered to ensure staff participation.

2. Interprofessional cooperation is required to ensure best use of time and resources, and to promote best outcomes for hospitalised people with diabetes.
3. Amendments to hospital policies may be required to ensure the safe and effective care of hospitalised patients with diabetes, in particular rapid availability of urgently required food.

BACKGROUND

Management of diabetes is one of the biggest challenges in international healthcare today (Dall, Zhang, Chen, Quick, & Yang, 2010; Karahalios, Somarajah, Hamblin, Karunajeewa, & Janus, 2018), with clinicians and researchers searching for new strategies to meet the challenges presented by an increasing populous with diabetes (von Eyben, 2014). The resulting increase in hospitalised patients with diabetes (Australian Institute for Health and Welfare, 2013) impacts on resources; and the additional workload associated with the management of this complex and challenging co-morbidity (Leeper, 2011; von Eyben, 2014) can impact significantly on ward routines.

Diabetes is often a secondary diagnosis (Karahalios et al., 2018). Hospital inpatients with diabetes are statistically more likely to have poorer prognoses (Fowler, 2009; Holman, Hillson, & Young, 2013; von Eyben, 2014), and longer lengths of hospital stay (Flanagan, Ellis, Baggott, Grimsehl, & English, 2010; Karahalios et al., 2018), than patients without diabetes but with the same primary diagnoses. Tingle (2012) has reported that many adverse outcomes experienced by people with diabetes are associated with sub-optimal inpatient care. Reports that insulin is one of the most likely prescribed drug to cause harm to patients is supported by evidence from Europe (Rayman, 2010; Tingle, 2012), Asia (Harada et al., 2016), Australia (NSW Health, 2015) and America (NICE-SUGAR Study Investigators, 2012; Pennsylvania Patient Safety Authority, 2010; Rayman, 2010), with data suggesting that 33% of reported insulin errors have resulted in death (Rayman, 2010).

Insulin has a relatively narrow therapeutic range, and careful monitoring is required. Hence the plethora of calls for the development of strategies to mitigate the adverse outcomes associated with inpatient hyperglycaemia (Fowler, 2009; Tingle, 2012) and insulin errors (Rayman, 2010; Tingle, 2012). Tingle has attributed many of these errors to “basic communication failing” (p. 691), which he states “raise acute patient safety and health quality concerns” (p. 691). Reported inaccuracies include both insulin administration errors and inaccurate or ambiguous transcribing errors (Pennsylvania Patient Safety Authority, 2010). The most serious inpatient medication errors have been classified as wrong-drug or wrong-dose errors. Tingle (2012) reports other prescription errors, including failure to sign or adjust orders.

With the more frequent identification of diabetes as a secondary diagnosis, these patients are now spread throughout inpatient hospital populations (Karahalios et al., 2018); meaning that all nursing and medical staff require current knowledge of diabetes management. This mixed methods study was designed to establish baseline generic knowledge and to explore future strategies to enhance inpatient care of people

with diabetes. While the focus of the study was mainly on nurses and midwives, the centrality of patient views and experience in this complex care area was recognised, and so recently discharged hospital patients with diabetes were also recruited into the study. Specific aims of the study were to:

1. assess current diabetes knowledge and related work practices in general and specialist inpatient clinical areas;
2. identify innovative new strategies to maintain optimal care for hospitalised patients with diabetes;
3. canvas nurses, midwives and patients for potential solutions to the challenges posed by the intensification of the ongoing diabetes burden on inpatient services;
4. identify strategies nurses and patients envisage could successfully maintain and improve clinical care for inpatients;

METHODS

A mixed methods design informed by the principles of Appreciate Inquiry (AI) was used to address the study aims. Quantitative data was collected via a diabetes knowledge questionnaire survey (Sullivan, 2006), distributed through an online platform (see Table 1). The knowledge questionnaire consisted of three initial demographic questions, followed by 16 questions testing knowledge of inpatient diabetes management and inquiring into related work practices. Permission was obtained to replicate the questionnaire in this current study, and minor changes were made in order to update specific areas of ward-based diabetes management. The qualitative component of this study was underpinned by AI, an approach described as a “social research method and organisational development intervention” (Trajkovski, 2013, p. 1225) that supports the espoused values of the participants, while remaining open to new possibilities (Moore, 2008). AI has built on its early beginnings by Cooperrider (1986) to become a successful approach to the facilitation of workplace engagement (Trajkovski, 2013) and change (Atkin & Lawson, 2006; Moore, 2008).

AI has been described as a form of action research (Atkin & Lawson, 2006). However, it differs from action research in that the focus of AI is the promotion of positive ideas and solutions. Consequently, those who participate in this process are directed towards ‘what does work’ or ‘what has worked in the past’. Thus, this participatory and collaborative approach facilitates the transformation of the inherent potential already present within the work place (Trajkovski, 2013). The egalitarian nature of the approach, which acknowledges existing social realities, has been credited with enhancing collaborative approaches across systems. Consequently, AI is “about learning, empowering and improvising to sustain the future” (Moore, 2008). It consists of 4 stages, which underpin data collection and analysis. The names given to each individual stage have, over time, varied slightly. These variations, however, have maintained the inherent principles of the research methodology. Likewise in this study: while the names chosen for these 4 stages were developed from the work of Atkin and Lawson (2006), Havens et al. (2006), Moore (2008) and Trajkovski (2013),

they were also adapted to meet the setting and the aims of this current study. These names are:

- a. **Appreciating** - The first step is to clarify the espoused values of the organisation and identify 'what gives life' to the organisation.
- a. **Innovating** - Based on the previous step, this identifies the breadth of all possibilities, of what might be possible.
- b. **Co-Constructing** - This is a co-construction of the first two steps, asking 'what should be'.
- c. **Delivering** - This final step identifies what can be realistically achieved and sustained.

DATA ANALYSIS

Data were analysed using descriptive statistics (survey) and by thematic analysis (focus group and interview data). This process involved: familiarisation with all the data; targeting or coding entities or "meaning units" (Mariano, 1995, p. 481); and, identification of themes, or patterns, that could be tested against the data (Mariano, 1995). The final stage in the analysis of the data collected during this mixed methods study involved i) comparison of data from the online staff questionnaire and the views expressed in the staff interviews and ii) comparison of the views of staff and patients.

STUDY SETTING

A metropolitan and regional tertiary referral hospital in Australia with almost 1000 beds and 2730 qualified nursing employees, comprising RMs (n=330), RNs (n=2200) and ENs (n=200).

PARTICIPANTS AND RECRUITMENT

The populations recruited were RMs, RNs, ENs and recently discharged ward patients with diabetes. Participants for the staff online survey and staff focus group interviews were recruited through an internal intranet broadcast system, hospital email lists, staff meetings and word of mouth. Patients were recruited for interview during their post-discharge attendance at an Integrated Care clinic.

ETHICAL ISSUES

Ethical approval was sought and obtained for this study. Participation was voluntary. For the online survey, active participation, which was anonymous, implied consent. Written consent was obtained for the staff focus groups and the patient interviews.

RESULTS

QUANTITATIVE RESULTS:

A range of nursing and midwifery staff (n=173), comprising RNs (n=147), RMs (n=12) and ENs (n=14) completed the online survey. Fifty four per cent of these respondents worked a Monday-Friday roster, 36% a 7-day rotating roster, 5% permanent nights, and 5% weekends only. Further data indicated that 11% of the respondents had worked in their current capacity for less than 3 years, 30% between 4-14 years and 59% for greater than 15 years. No further information was collected about the survey respondents.

Seventeen survey questions (Questions 4-20) tested knowledge of inpatient diabetes management and enquired into related work practices (see Table 1 for survey questions). Results from these responses are presented under the subheadings: Pathophysiology and Management of Blood Glucose; Oral Hypoglycaemic Agents and Insulin Administration; Intravenous Insulin Administration; Use of Nursing and Midwifery Procedures on the Hospital Intranet; and, Open Question for Further Feedback.

PATHOPHYSIOLOGY AND MANAGEMENT OF BLOOD GLUCOSE:

Four of the questions were designed to assess understanding of basic inpatient management of diabetes (see Table 2). Most respondents were aware of the role of insulin in the body (94%) and 75% indicated they knew that insulin therapy was not restricted solely to patients with Type 1 diabetes. Eighty two per cent of respondents were aware of the recommended target range for blood glucose levels (BGLs) for inpatients with diabetes, 73% correctly answered the question of when they would conduct these tests in relation to meals and 75% correctly indicating that hospital policy required daily control testing for BGL meters.

Table 2 Pathophysiology and Management of Blood Glucose

	% of <u>Correct Responses:</u>
Q9 - Role of insulin in the body	94%
Q11- Knowledge that people with Type 2 diabetes may require insulin	75%
Q4 - Recommended blood glucose range for inpatients with diabetes	82%
Q5 - Recommended BGL testing times for inpatients	73%
Q6 - Knowledge of how often to conduct control tests for BGL meters	75%

ORAL HYPOGLYCAEMIC AGENTS AND INSULIN ADMINISTRATION:

In this category (see Table 3), 90% of respondents indicated adherence to the local policy of labelling stock bottles of insulin with patient details after use. Only 58% of respondents were aware that the rapid-acting insulins listed in question 10 should not be administered until the patient had immediate access to food; with 23% of the respondents believing these insulins should be given 30 minutes before the meal, indicating they were unaware of the speed of action of this group of insulins. In answers to question 8, 76% of respondents incorrectly assumed that all of the drugs listed carried a risk of hypoglycaemic reactions; and only 15% correctly identified the hypoglycaemic medication on the list. Results from question 7, relating to the administration of insulin following hypoglycaemic events, were also unfavourable, with only 34% stating they would give the prescribed insulin once they had successfully treated the hypoglycaemic episode and the patient had their meal. In contrast to this correct answer, 10% of respondents indicated they would omit the morning insulin and a further 40% stated they, too, would omit the insulin if the post-prandial BGL was elevated. Sixteen per cent indicated they would call the RMO for an immediate assessment.

Table 3 Oral Hypoglycaemic Agents and Insulin Administration

	% of <u>Correct Responses</u>:
Q13- Correct labelling following use of stock insulin	90%
Q10- Administration time of fast acting insulins (relative to meal)	58%
Q8 - Identification of which diabetes oral medication may cause Hypoglycaemia	15%
Q7 - Management of hypoglycaemia following administration of fast acting glucose	34%

INTRAVENOUS INSULIN ADMINISTRATION:

When assessing if the participants were aware that insulin binds to plastic tubing (question 12), 40% of respondents answered incorrectly, despite the fact that the reasoning behind the practice was provided as part of the question (See table 4). These questions also assessed confidence levels of staff regarding intravenous insulin administration (questions 14-16). Results show that only 67% of respondents self-assessed as confident when managing insulin-glucose infusions. Furthermore, of the 85% that stated they currently use the Insulin Adjustment Algorithm, only 58% indicated they felt confident using this tool.

Table 4 Intravenous Insulin Administration

	% of Responses to the options presented:
Q12 - Correct preparation of tubing before insulin infusion	60%
Q 16 - Confidence managing an insulin-glucose infusion	Confident: 67%
	Just OK: 14%
	Not Confident: 9%
Q 14 – % currently using the Insulin Adjustment Algorithm	85%
Q 15 - Level of confidence of those using the Algorithm	Confident: 58%
	Just OK: 19%
	Not Confident: 5%

USE OF NURSING AND MIDWIFERY PROCEDURES ON THE HOSPITAL INTRANET

Almost half (48%) of respondents indicated they used online hospital-approved nursing and midwifery procedures. Of this number, 35% reported accessing them within the last 12 months, and 23% more than a year previously. Of the 95 responses to an open question related to the usefulness of this resource, 16 said they had either never accessed these procedures or were not aware of their existence.

OPEN QUESTION FOR FURTHER FEEDBACK:

Responses to the final question (Question 20) included every-day concerns related to intra-hospital systems. Specific points related to delays in insulin orders by medical officers and delays in food delivery. Requests for further educational opportunities

included: additional face-to-face education, clarification of policies and procedures specific to their specialty; a return to the previous practice of annual diabetes study days; and, the inclusion of a diabetes module on the hospital intranet education system.

QUALITATIVE RESULTS

A total of 40 Nurses and Midwives and 6 patients participated in the qualitative component of this study, which comprised staff focus group interviews and patient individual interviews.

STAFF FOCUS GROUP INTERVIEWS

Participants attending these focus groups were allocated to either the four Nurse/Midwife Unit Manager groups (n=12) or the six focus groups that combined RNs, ENs and RMs (n=28). These focus group were conducted by three of the research team and were recorded and transcribed verbatim. Interviews continued until saturation of data was achieved and all staff who chose to participate in the focus groups had been included.

In keeping with AI, the focus groups began with discussion of the participants' individual and collective strengths. Identification with these strengths provided the context for the results of this study. These themes were:

1. Staff Knowledge and Skills, involving:
 - Clinically effective medical and nursing care of patients
 - Ongoing development of staff knowledge and skills
2. Team Work, Communication and Maximisation of Ward Efficiency, involving:
 - Respect & co-operation between specialities and disciplines
 - Effective and economic use of labour and equipment
3. Patient Care, Comfort and Safety, involving:
 - Policies relating to physical and emotional welfare of patients
 - Provision of ancillary services for comfort and safety of patients

As the staff focus groups progressed, various aspects of these themes, including staff concerns and potential solutions, were debated. While this section lists their recommendations under three main themes, the overarching theme that pervaded much of the discussion was their acute awareness that, in order to ensure their aspirations for their patients could be brought to fruition, interprofessional cooperation and executive support were essential. The three themes are discussed in detail below.

1. STAFF KNOWLEDGE AND SKILLS

Discussion of innovative education strategies already in place in some wards formed a basis for discussion of solutions for other inpatient areas of the hospital. These suggestions ranged from individually designed mentoring programs for recent graduates to the re-introduction of annual supernumerary diabetes study days for experienced staff. The focus for many was on the advantages of a whole-day program

away from the wards because: *"10 years ago, we were able to organise a day for education specific to the specialty ... that was great."*

Some participants discussed a project currently working very well in some areas, which could incorporate diabetes as the *"Hot Topic"* for the month. They credited much of the success of this multi-professional project to the emphasis on regular short-and-sharp and varied informative strategies that utilised team-building approaches and that took place over a whole month.

The participants in the focus groups were keen to develop education programs specific for each ward, for example, further education on the Insulin Adjustment Algorithm, and mobile phone applications (apps) for calculating medication doses. In addition, experienced staff requested the development of an advanced interdisciplinary program, involving an Endocrinologist, Diabetes Nurse Practitioner (NP) and/or Clinical Nurse Consultant (CNC). Other ideas included requests for written diabetes resources to assist ward staff when answering patients' questions, and handouts for patients when Diabetes Educators were unavailable.

2. TEAM WORK, COMMUNICATION & MAXIMISATION OF WARD EFFICIENCY

Both nurses and midwives expressed concerns regarding the timely adjustments of insulin orders. Not only did these delays flow on to sometimes delay patients' meals, but there was a loss of direct nursing care because the nurses were compelled to spend considerable time contacting prescribers by phone. Our results also indicate that patients whose diabetes was managed by a team other than the Endocrine team were the ones who frequently waited for their insulin dose adjustment and, therefore, their meals. This disparity appears to have occurred because of the additional pressures of work placed on the junior members of the admitting teams to manage their patients' diabetes in addition to their primary diagnoses. A practical suggestion from the focus group participants involved sending a routine page to all resident medical officers of the relevant teams to remind them to chart their insulin orders. This simple modification could potentially effectively enhance efficiency and reduce delays.

Many of the concerns of the midwives were specific to their need to facilitate admission and discharge for patients, particularly those diagnosed with gestational diabetes. On admission, many midwives spent considerable time, particularly at night, assessing whom to contact from the multiple Endocrine teams and making the appropriate phone call. Stated one, *"It's a bit hit and miss ... working out who you might call."* Their solution would involve a routine antenatal entry into patient notes, clearly identifying a named medical officer (or team) to contact. This could also apply to other medical specialties working alongside the obstetric teams. Following delivery, discharge of patients diagnosed with gestational diabetes was frequently delayed due to the unavailability of the relevant Endocrine team personnel. As they said, *"Trying to get anybody reviewed ... someone's discharge can be put back hours."* Suggestions to resolve this included the intercession of the diabetes CNC, as required, and/or greater involvement of the diabetes CNC in the discharge of these patients.

Many nurses were utilising their own mobile phones at the bedside because they provided easy access to nursing procedures and other information technology applications (IT apps). This supplemented the insufficient numbers of computers to cope with ongoing demand. Suggested solutions included, not only increasing the number of computers, but also provision of IT equipment (e.g. mobile phones) within each ward, for easier access. Some also emphasised the efficacy of providing access to hospital procedures and web-based learning sessions from home because time pressures frequently precluded their use at work. They also pointed out that, if public access to these procedures on the hospital website was facilitated, then staff of smaller local and rural hospitals could also benefit. Participants also requested access to the Diabetes Educator for routine referrals via a newly developed intranet e-Consult system, which was already proving to be time saving.

Another concern expressed was the expectation that both nurses and midwives must leave their ward areas to perform various non-nursing tasks, for example, collecting and restocking hypo kits, or collecting urgently required patient records. As they explained: *"If you want them, you go down and get them."* however *"Nurses are getting less time to do patient care as time goes on."* These participants found it difficult to understand why the delivery of these items to the wards continued, in some hospitals, to be delegated to health professionals when appropriate ancillary staff were available to fulfil this function. For example, the hypo kits, which were restocked from the kitchen, could potentially be delivered to ward areas via the food trolleys.

3. PATIENT CARE, COMFORT & SAFETY

Participants expressed concern over the delays and difficulties they regularly experienced obtaining meals for newly-admitted patients or following a diabetes hypoglycaemic event. This subject prompted vigorous debate during all the focus groups. Shortages of easily available meals was attributed to recent changes which had altered previous patterns of food distribution and storage.

The following conversation between a group of participants clearly explains their concerns: *"Some wards were able to order ... a couple of spare meals for late admissions"; "The rules have now changed"; "By seven o'clock everything gets taken out of the fridge, and there's nothing left"; "It's a headache for the nurses to then have to order it and get in touch with the kitchen, and try and get a meal. They end up spending a lot of time, a considerable amount."* This lost time was particularly critical for night staff, who must often spend significant time away from patients in search of food from other wards. These participants were aware that there were some pre-packaged frozen meals available after-hours that were stored some distance from the ward areas. However, participants were reluctant to use these meals because patients had complained about the quality of these foods and, in some cases, refused to eat them.

Unable to work with the system, these nurses were resorting to other options which included bringing in bread from home or suggesting patients or relatives go down to purchase food from the café. A further frustration was expressed by two of the participants as, *"There're so many roadblocks"* and *"Ownership is always on the nurses"*

when they are told, *“Well, you need to reorder it. You need to sort it out, nurse. Can’t you? No, because the system won’t allow me to. So then, there’s this additional time...”*.

Suggestions to resolve some of these problems focused on, for example, the re-allocation of non-clinical staff to source and deliver the food and the introduction of after-hours fresh food storage close to ward areas, such as refrigerated vending machines on each floor, that could be accessed using the patients’ identity barcodes.

Further incidences of difficulties associated with food or drink delivery occurred when patients were temporarily absent from their rooms or because there was a precaution sign on their door. Kitchen staff often failed to inform the nurses which patient were not given a meal or a snack. Explained one of the participants, *“Some of the people who push the ‘in between’ trolleys ... make little effort to check some of the rooms ... and God forbid if there’s a precaution sign - they just trolley straight past those.”* These focus group participants indicated that enhanced education of food service staff may help to resolve these problems.

PATIENT INDIVIDUAL INTERVIEWS

Six recently discharged patients with diabetes were recruited for interview during their post-discharge attendance at an Integrated Care clinic.

Participants

All patients interviewed had originally been admitted through the Accident and Emergency Department. Five patients were later admitted to a ward, with lengths of stay ranging from 1-10 days. All but one patient were on insulin prior to admission and the other patient commenced insulin as an inpatient. The patients who participated in this study had all been seen by a Diabetes Educator while in hospital and, on discharge, were given information of whom to contact if they had any questions. The concerns expressed by these patients have been analysed under two themes: Food Provision and Communication.

FOOD PROVISION

While two patients stated they had no complaints about food, two others complained that the meals were, at times, either *“unpalatable”* or *“atrocious”*. Three patients also stated that they had missed out on food or drink on at least one occasion, one while being moved from the Accident and Emergency Department to the ward area, the other two because they were not in their rooms when the between-meals trolley came around.

COMMUNICATION

Impaired communication between the patient and nursing staff regarding the patient’s immediate needs can be identified in some of these interviews. This was demonstrated, firstly, in the reluctance of two patients to inform the nurses they had missed out on a cup of tea. Both patients indicated that their reluctance was underpinned by their concerns for the pressure the nurses were under, with one stating there were *“not enough staff”*. A third patient concealed her own need for attention because she was aware the emergency department nurses were dealing with a difficult patient.

Poor communication between one patient and medical staff was demonstrated when the patient was unexpectedly told he was to be discharged “*just after lunch*”. This caused immediate unease regarding discharge arrangements and he then “*waited all day*” for the doctor, who eventually “*only rang*” to arrange discharge. A further incidence relates to medical diabetes management, with one patient stating that, while his blood glucose levels had been satisfactory prior to admission, they had risen significantly as an inpatient. While this could be explained by the increase in one of his concurrent medications, which can affect BGLs, he indicated this was not explained to him, leaving him with serious concerns about his overall glycaemic control.

Two participants had some questions regarding management of their diabetes at home but none of the participants had contacted the hospital following discharge to allay their anxiety. On the day of these interviews, however, these patients had already seen the Endocrine team, which included a Diabetes Educator, and stated that their questions were now answered.

DISCUSSION

In line with international debate on the urgent need to enhance inpatient diabetes management (Pennsylvania Patient Safety Authority, 2010; Rayman, 2010; Tingle, 2012; Wong & Lai, 2016), the nurses and midwives who participated in these focus groups searched for solutions that would effectively optimise diabetes management for hospital inpatients within the context of an escalating diabetes burden on services. Individual patient interviews then further expanded some aspects of these results.

Some deficits in knowledge and confidence regarding diabetes care, as uncovered in the survey; along with reported impaired diabetes decision-making skills among some staff, as discussed in the focus groups, underline the necessity of maintaining ongoing scrutiny of diabetes skills of hospital-based health professionals (as also recommended by Herring et al., 2013; Rayman, 2010; Yacoub et al., 2014). In a similar vein, Wong and Lai (2016) highlight the need for a review of best-practice policies for inpatient diabetes medical management. Reports of junior medical staff lacking confidence when initiating insulin therapy in insulin-naïve patients (Wong & Lai, 2016), along with the nursing survey results reported in this paper, point towards a potential gap in diabetes knowledge of those nurses and medical officers who work less frequently with patients with diabetes. However, with the more frequent identification of diabetes as a secondary diagnosis, these patients are now spread throughout all areas of the hospital. Consequently, it is essential that all nurses and medical officers are proficient in managing the basic requirements of inpatient diabetes care.

In order to meet the changing needs of diabetes care, the focus group participants made a variety of suggestions designed to enhance ward efficiency. These included more active involvement of the Diabetes CNC and/or NP in the development of innovative and flexible ward education projects and, in some incidences, their need for these senior nurse clinicians to act as intermediaries between disciplines. For midwives, in particular, appropriate interventions can hasten discharge, following delivery, for patients diagnosed with gestational diabetes. Other suggestions include

the use of IT, with many nurses already using their mobile phones in their everyday work on the wards. Mobile phone apps hold a significant potential in health care; however they also vary in their efficacy and safety. Education strategies on the secure use of such devices can be based on a variety of published resources, such as those published by Ferguson and Jackson (2017) and Ross and Myers (2017).

As these results have shown, multidisciplinary projects can be very successful; however they can also be the most difficult to get off the ground. Competing priorities between disciplines (Tang, Zhou, Chan, & Liaw, 2017) and the resulting inability of front line nurses to make their voices heard “on crucial issues that may highlight a need for practice and system change” (Jackson, Girvin, & Davidson, 2014, page 131) can impede communication and innovation in health care. It is these same factors that result in the daily frustration of many nurses who must spend valuable patient time collecting urgently required supplies or food, or attempting to contact prescribers to remind them to adjust insulin orders on time. In the hospital in which these interviews were conducted, an Inpatient Diabetes Management Service (IDMS), which comprises a registrar and a consultant, is given free access to patients in the surgical wards, with a blanket referral for the purpose of reviewing glycaemic control and facilitating the stabilisation of diabetes. It is of note that the nurses working on these surgical wards expressed no concerns about their patients’ insulin adjustments, indicating that this strategy was meeting the immediate needs of patients and staff. A simple solution for some of the other wards was suggested during the focus groups because it is already utilised in the hospital for other purposes. This is to send a routine group page to all resident medical officers of the relevant teams in the late afternoon, to remind them to update their insulin orders.

Similar expectations of the professional role of nurses and midwives, as discussed in these focus groups, have long caused worldwide concern (Dirik & Intepeler, 2017; Hildingsson et al., 2016; McCabe, 2004; Omura, Stone, Maguire, & Levett-Jones, 2018; Tan, Zhou, & Kelly, 2017). Suggestions these problems have their genesis in outmoded patterns of interdisciplinary communication were first described by Stein (1967) as ‘the doctor-nurse game’. Other authors have focused, not on the source of these behaviours, but on the present need for nurses to develop resilience and self-efficacy (McDonald, Jackson, Vickers, & Wilkes, 2016) to combat the disempowerment that interdisciplinary communication difficulties can engender.

In all the staff focus groups, there was intense debate regarding the consequences of inadequate or inappropriate food. While fast acting glucose is available for management of immediate hypoglycaemic symptoms, many described the current food services as ineffective in preventing these events because of the excessive wait for urgently requested meals. In addition, many nurses and some patients described the food as unpalatable. Similar problems have been identified internationally, for example, Bonetti et al. (2017), who indicated similar concerns for patients in Italian hospitals. Furthermore, this study highlighted the potential flow-on effects to organisational changes in the way patient foods were stored and distributed; highlighting the need for widespread consultation, right to the point-of-care, prior to

such changes being implemented, and then having a strategy to both evaluate and respond to any problems arising from such changes.

RELEVANCE TO CLINICAL PRACTICE

Our findings have reinforced the need for ongoing diabetes education for hospital staff, and the importance of flexible delivery in ensuring staff participation. Furthermore, our findings highlight the need for a whole-of-organisation approach to the successful implementation of strategies to reduce pressure within already pressured systems; enhance safety and effectively meet the immediate medical and comfort needs of patients, while reducing preventable delays in hospital discharge.

CONCLUSIONS

This mixed methods study sought to establish baseline generic knowledge and to explore future strategies to enhance inpatient care of people with diabetes from the perspectives of key stakeholders, including patients. Through the utilisation of mixed methods in which the qualitative aspect was informed by Appreciative Inquiry, this study has elicited recommendations from nurses and midwives that align the demands of ongoing technological advancements, principles of multidisciplinary team building and values that underpin traditional nursing, midwifery and medical practice.

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