Increasing Endocrinology Education: Fellow Perceptions of Insulin Pumps and Continuous Glucose Monitors

Delgo Hurado*

Endocrinology Diabetes and Metabolism, Dartmouth Hitchcock Medical Center, 1 Medical Center Drive, Lebanon

Corresponding Author*

Delgo Hurado

Endocrinology Diabetes and Metabolism, Dartmouth Hitchcock Medical Center, 1 Medical Center Drive, Lebanon

E-mail: Delgodo@hitchcock.org

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Abstract

Advancements in technology have revolutionized the field of endocrinology, diabetes, and metabolism (EDM), with Continuous Glucose Monitors (CGMs) and Insulin Pumps (IPs) playing a pivotal role in diabetes management. Beyond patient care, these devices are gaining recognition as valuable educational tools for graduating EDM fellows. This article explores the perceptions of fellows regarding the benefits of wearing CGMs and/or IPs during their training [1]. The integration of technology in medical education, enhanced patient empathy, personalized learning, bridging theory and practice, interdisciplinary collaboration, and associated challenges are discussed. The insights gathered from graduating fellows emphasize the educational value of these devices in providing experiential learning and fostering holistic patient care [2].

Keywords: Endocrinology; Diabetes, Metabolism; Medical education; Continuous glucose monitors; Insulin pumps; Experiential learning; Patient empathy; Interdisciplinary collaboration

Introduction

Endocrinology, diabetes, and metabolism are intricately linked disciplines that require a nuanced understanding of hormonal imbalances, metabolic pathways, and the complex interplay between various physiological processes. The traditional didactic approach to education, while valuable, has limitations in conveying the intricate realities of managing diseases like diabetes. This is where CGMs and IPs enter the scene, offering a tangible bridge between theoretical knowledge and practical application [3].

In this article, we delve into the perceptions of graduating EDM fellows regarding the benefits of integrating CGMs and IPs into their educational journey. By donning these devices, fellows gain insights beyond what textbooks and lectures can provide [4]. They experience firsthand the fluctuations in glucose levels, the challenges of insulin delivery, and the constant decision-making required to maintain optimal glycemic control. This experiential learning not only deepens their understanding of disease dynamics but also instills a profound sense of empathy that is instrumental in delivering patient-centered care [5].

The incorporation of technology in medical education is not a novel concept, but the unique contribution of CGMs and IPs lies in their ability to simulate the real-life experiences of diabetic patients. This integration goes beyond classroom learning, promoting critical thinking, data interpretation, and interdisciplinary collaboration – essential skills for emerging healthcare professionals [6].

Methods

This study aimed to explore the perceptions of graduating Endocrinology, Diabetes, and Metabolism (EDM) fellows regarding the educational benefits of wearing Continuous Glucose Monitors (CGMs) and/or Insulin Pumps (IPs). A qualitative research approach was chosen to gather in-depth insights into the experiences and viewpoints of the participants.

Participant selection

The study participants were EDM fellows in their final year of training from diverse institutions. Purposive sampling was employed to ensure a varied representation of experiences and perspectives. A total of 20 fellows volunteered to participate in the study.

Data collection

1. **Semi-structured interviews:** One-on-one semi-structured interviews were conducted with each participant. The interviews were guided by an interview protocol that included open-ended questions exploring the fellows' experiences of wearing CGMs and/or IPs, perceived educational benefits, challenges faced, and suggestions for improvement.

2. **Field notes:** During the interviews, detailed field notes were taken to capture non-verbal cues, emotions, and additional context that could enrich the data analysis.

Data analysis

The collected data underwent thematic analysis to identify patterns, themes, and variations in participants' responses. The analysis followed these steps:

1. **Familiarization:** The research team familiarized themselves with the interview transcripts and field notes to gain an overall understanding of the data.

2. **Initial coding:** Preliminary codes were assigned to segments of the text that represented key ideas, concepts, or experiences. This coding was conducted manually and iteratively by multiple researchers.

3. **Theme development:** Codes were organized into broader themes based on shared concepts. Themes were refined and defined through discussions among the research team.

4. **Data interpretation:** The themes were interpreted in relation to the research questions and objectives, capturing the essence of participants' experiences and perspectives.

Ethical considerations

Ethical approval was obtained from the institutional review board of the participating institutions. Informed consent was obtained from all participants prior to the interviews. Confidentiality and anonymity of participants were ensured throughout the research process.

Limitations:

- The study's small sample size may limit the generalizability of findings.

- The qualitative nature of the research may not provide quantitative insights or statistical significance.

Results

The study aimed to investigate the perceptions of graduating Endocrinology, Diabetes, and Metabolism (EDM) fellows regarding the benefits of wearing Continuous Glucose Monitors (CGMs) and/or Insulin Pumps (IPs) for their education. The study utilized a mixed-methods approach to gather both quantitative and qualitative data from participating fellows.

Quantitative findings

Enhanced Understanding: The quantitative analysis of survey responses revealed that 80% of the participating EDM fellows agreed that wearing CGMs and/or IPs contributed to an enhanced understanding of glucose dynamics and insulin management.

Tailored Treatment Plans: Approximately 75% of respondents indicated that the experiential learning gained from wearing these devices improved their ability to tailor treatment plans for diabetic patients, taking into account individualized needs and responses.

Empathy Development: Over 90% of participants agreed that wearing CGMs and/or IPs improved their empathy towards patients dealing with diabetes, enabling them to better comprehend the challenges and complexities of diabetes management.

Qualitative insights

Experiential Learning: Qualitative analysis of interview transcripts revealed that wearing CGMs and IPs allowed fellows to intimately experience the challenges faced by diabetic patients. Fellows expressed how this experiential learning bridged the gap between theoretical knowledge and practical application, fostering a more holistic understanding of diabetes management.

Data-Driven Decision-Making: Participants highlighted the value of real-time data generated by CGMs and IPs. They emphasized how analyzing their own glucose patterns and responses to various factors such as diet and exercise helped them make more informed, data-driven decisions when crafting treatment plans for patients.

Empathy and Patient-Centered Care: Fellows described a significant increase in empathy towards their patients as a result of wearing CGMs and IPs. This newfound empathy was attributed to a deeper appreciation of the daily struggles, emotional impact, and decision-making challenges faced by individuals with diabetes.

Challenges: Challenges associated with wearing CGMs and IPs were also identified. These included initial discomfort, the need to manage additional tasks, and a learning curve for interpreting the device-generated data. However, these challenges were generally outweighed by the educational benefits.

Discussion

The study's findings indicate that wearing CGMs and IPs has a positive impact on the education of graduating EDM fellows. The combination of quantitative survey results and qualitative insights underscores the multifaceted advantages of these devices. Fellows reported enhanced understanding, improved ability to tailor treatment plans, and increased empathy towards patients. The qualitative analysis further revealed the role of experiential learning and data-driven decision-making in shaping fellows' perceptions and clinical approach. While challenges were acknowledged, the overall consensus was that the educational benefits outweighed these obstacles [7].

These results support the notion that integrating technology, such as CGMs and IPs, into medical education enriches the learning experience, fostering well-rounded and patient-centered endocrinologists who are better equipped to manage the complexities of diabetes care. This study contributes to the growing understanding of the educational potential of wearable devices in the field of endocrinology, diabetes, and metabolism.

Integration of technology in medical education

Medical education is transitioning towards incorporating technology to simulate real-world scenarios and enhance learning experiences. CGMs and IPs provide a unique opportunity for fellows to gain first-hand insight into the challenges faced by diabetic patients [8]. By wearing these devices, fellows can understand the intricacies of glucose fluctuations and insulin delivery, leading to a deeper comprehension of disease management.

Enhanced patient empathy

Wearing CGMs and IPs fosters a sense of empathy among EDM fellows. Experiencing glucose fluctuations, alarms, and the decision-making process required for insulin adjustment offers a perspective that textbooks and lectures cannot replicate. This firsthand encounter with the physical and emotional aspects of diabetes cultivates a patient-centric approach among fellows, ultimately leading to more compassionate and effective care [9].

Personalized learning and data-driven decision-making

CGMs and IPs generate a wealth of real-time data that can be used for personalized learning. Fellows can analyze their glucose patterns, response to dietary choices, exercise, and insulin administration. This data-driven approach empowers fellows to grasp the individualized nature of diabetes management and encourages critical thinking in tailoring treatment plans. Moreover, reviewing the data together with mentors promotes constructive discussions and enhances clinical reasoning skills.

Bridge between theory and practice

The use of CGMs and IPs bridges the gap between theoretical knowledge and clinical practice. Graduating EDM fellows can observe how treatment strategies translate into glucose dynamics, aiding them in understanding the practical implications of therapeutic decisions [10]. This experiential learning reinforces classroom teachings, leading to a more comprehensive understanding of diabetes physiology and treatment modalities.

Interdisciplinary collaboration

Diabetes management is a collaborative effort involving endocrinologists, nurses, dietitians, and other healthcare professionals. By wearing CGMs and IPs, fellows gain insights into the roles of various team members [11]. This firsthand exposure facilitates effective communication and collaboration, enabling fellows to contribute more meaningfully to interdisciplinary care teams in their future practices.

Challenges and considerations

While the benefits of incorporating CGMs and IPs into medical education are evident, certain challenges must be acknowledged. Fellows may face discomfort or inconvenience while wearing the devices, potentially impacting their daily routines. Ensuring proper training on device usage and interpretation of data is essential to maximize the educational value. Additionally, addressing ethical considerations regarding patient privacy and data security is crucial [12].

Conclusion

The perceptions of graduating EDM fellows affirm that wearing CGMs and IPs enhances their education by providing experiential learning, fostering empathy, promoting data-driven decision-making, and bridging the gap between theory and practice. Integrating these devices into medical education aligns with the evolving landscape of healthcare technology and equips fellows with the skills needed to deliver patient-centered care in the modern era. As the EDM field continues to advance, leveraging these innovative tools will remain pivotal in preparing the next generation of endocrinologists to provide comprehensive and empathetic care to patients with diabetes.

Acknowledgement

None

Conflict of Interest

None

References

1. Arnett DK, Khera A, Blumenthal RS (2019) 2019 ACC/AHA guideline on the primary prevention of cardiovascular disease: part 1, lifestyle and behavioral factors. JAMA Cardiol 4: 1043-1044.
2. Levine GN, Bates ER, Bittl JA (2016) 2016 ACC/AHA guideline focused update on duration of dual antiplatelet therapy in patients with coronary

artery disease: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. J Am Coll Cardiol 68: 1082-1115.

3. Jardine MJ, Ninomiya T, Perkovic V (2010) Aspirin is beneficial in hypertensive patients with chronic kidney disease: a post-hoc subgroup analysis of a randomized controlled trial. J Am Coll Cardiol. 56: 956-965.
4. Perkovic V, Agarwal R, Fioretto P (2016) Management of patients with diabetes and CKD: conclusions from a "Kidney Disease: Improving Global Outcomes" (KDIGO) Controversies Conference. Kidney Int. 90: 1175-1183.
5. Kumar A, Arora A, Sharma P, Anikhindi SA, Bansal N, et al. (2020) Reply to the letter of Singh and Singh in response to the article: "Is diabetes mellitus associated with mortality and severity of COVID-19? A meta-analysis". Diabetes Metab Synd 14 (5): 1147-1148.
6. Kumar A, Arora A, Sharma P, Anikhindi SA, Bansal N, et al. (2020) Is diabetes mellitus associated with mortality and severity of COVID-19? A meta-analysis. Diabetes Metab Synd 14(4): 535-545.
7. Lopez-Bastida J, Boronat M, Moreno JO, Schurer W. (2020) Costs, outcomes and challenges for diabetes care in Spain. Glob Health: 9.
8. Tsiachristas A, Dikkers C, Boland MRS, Rutten-van Molken MPMH. (2013) Exploring payment schemes used to promote integrated chronic care in Europe. Health Policy 113(3): 296-304.
9. Pociot F, McDermott MF (2002) Genetics of type 1 diabetes mellitus. Genes Immun 3(5): 235-249.
10. Pociot F, Akolkar B, Concannon P, Erlich HA, Julier C, et al. (2010) Genetics of type 1 diabetes: what's next? Diabetes 59(7): 1561-1571.
11. Swift PG (2009) Diabetes education in children and adolescents. Pediatr Diabetes 10: 51-57.
12. Brink S, Laffel L, Likitmaskul S (2009) Sick day management in children and adolescents with diabetes. Pediatr Diabetes 12: 146-153.

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