

ASSESSMENT OF KNOWLEDGE ABOUT INSULIN HANDLING AND ADMINISTRATION BY PHARMACY STUDENTS

Gustavo Borges de Oliveira Arantes¹

Gabriella Moraes Alves²

Giovanna Maria de Oliveira Tomé³

Jean de Bessa Melo⁴

Janaína Andrea Moscatto⁵

Evangelical University of Goiás – UniEVANGÉLICA¹²³⁴⁵

ABSTRACT

Diabetes mellitus is a chronic endocrine-metabolic disease that is treated with medications that improve insulin production or action, as well as the administration of exogenous insulin. Therefore, insulin must be stored and handled correctly in order to minimize application errors and ensure glycemic control. Focusing on this idea, the overall objective of this project is to assess the knowledge of Pharmacy students at the Evangelical University of Goiás regarding the handling and administration of insulin. The assessment was carried out using a questionnaire to evaluate errors and correct answers regarding the main guidelines for patients on the handling and administration of insulin. The results showed that the sub-items related to insulin homogenization, correct selection of application sites, time of removal from the refrigerator, and needle protection had the highest error rates. On the other hand, the items with the highest accuracy refer to the appropriate choice of application site, correct handling in case of frozen insulin, and the crucial importance of asepsis. The study revealed gaps in the students' knowledge of insulin therapy, indicating the need to reinforce pharmaceutical training and promote new researches to address these deficiencies and, consequently, increase the safety and effectiveness of diabetes mellitus treatment.

Keywords: Health Education; Diabetes Mellitus; Insulin.

INTRODUCTION

Diabetes mellitus (DM) is an endocrine-metabolic disease of heterogeneous etiology characterized by persistent hyperglycemia resulting from defective insulin secretion or action. That said, the disease can present with acute complications, such as ketoacidosis or hyperglycemic hyperosmolar syndrome, and chronic complications, which can be microvascular or macrovascular, such as retinopathy and coronary artery disease, respectively (BRASIL, 2018).

In this scenario, insulin therapy is understood as one of the main therapeutic approaches to DM, especially in cases where endogenous insulin production is deficient or absent. Thus, insulin therapy regimens should mimic physiological secretion, and therefore, the basal-bolus therapy strategy should be instituted early, with multiple daily insulin applications.

Thus, therapeutic efficacy depends not only on the correct dosage, but also on proper handling and application, and clear guidelines on storage, preparation, and insulin application techniques are extremely important to ensure glycemic control and avoid complications such as hypoglycemia or lipodystrophy, resulting in safer and more effective treatment (JÚNIOR, GABBAY, and LAMOUNIER, 2023).

According to Silva et al (2023), in assessing adherence to good insulin therapy practice recommendations, 65% of patients were categorized as partially adhering to good practices with intermediate adherence to guidelines. Thus, patient adherence to recommendations is crucial for greater therapeutic efficacy, since knowledge associated with incorrect skills results in technical barriers and barriers to access to therapeutic management of DM. That said, the objective of this study is to assess the knowledge of Pharmacy students at the Evangelical University of Goiás regarding the handling and administration of insulin.

METHOD

This is a quantitative, cross-sectional, methodological study approved by the Research Ethics Committee of the Evangelical University of Goiás (CEP - UniEVANGÉLICA), with Ethical Review Certificate number 77132123.3.0000.5076. The total estimated population was 200 pharmacy students enrolled between the 5th and 10th semesters at UniEVANGÉLICA, with the sample defined by convenience.

In order to respond to the objective established above, a printed questionnaire was administered to collect data on the level of education regarding the handling and administration of insulin by pharmacy students. The questionnaire was administered in the classroom, 20 minutes before the start of classes, to students who agreed to participate and signed the Free and Informed Consent Form (FICF). For data analysis, the quantitative results obtained were tabulated in relative frequency (%) and absolute frequency (n) in Microsoft Excel®, so that the frequencies between the groups surveyed could then be compared.

RESULTS

A total of 135 questionnaires were answered during the study, with 38 responses from 5th-year pharmacy students at UniEVANGÉLICA, 14 responses from 6th-year students, 27 responses from 7th-year students, 10 responses from the 8th semester, 28 responses from the 9th semester, and 18 responses from the 10th semester. Based on the answers analyzed, the number of correct answers in absolute frequency (n) and relative frequency (%) per semester analyzed are described below (Table 01).

Table 01. Absolute (n) and Relative (%) Frequencies of Correct Answers to the Questionnaire

Item evaluated by questionnaire	5th period n	6th period n	7th period n	8th period n	9th period n (%)	10th period n
Q1. Storage	13	8	12	4	15	12 (30.8)
Q2. Frozen insulin	25	14	26 (66.7)	6 (15.4)	16	15
Q3. Time of withdrawal	13	0	10	1	11	8 (20.5)
Q4. Homogenization	8 (20.5)	3 (7.7)	5 (12.8)	1 (2.6)	9 (23.1)	3 (7.7)
Q5. Asepsis of bottles	28 (71.8)	8	19	9	25	15
Q6a. Application of antiseptics	15	8	14	3	18	5 (12.8)
Q6b. Skin fold	17 (43.6)	8	13	4	10	4
Q6c. Needle insertion	15	6	13	5	13	10 (25.6)
Q6d. Administration	24 (43.6)	6	14	2 (5.1)	11	12 (30.8)
Q6e. Needle in fabric	13	3	3	1	7	4 (10.3)
Q6f. Needle removal	12 (30.8)	8	10	4	9	8 (20.5)
Q6g. Conduct after	14 (35.9)	6 (15.4)	12	5	7	5
Q7a. Bottle sterilization	10 (25.6)	4 (10.3)	7 (17.9)	4 (10.3)	10 (25.6)	5 (12.8)
Q7b. Aspiration insulin	20	11	20	5	14	6 (15.4)
Q7c. Regular aspiration	20	11	21	4	18	6 (15.4)
Q7d. Order of aspiration	25	12	23	6 (15.4)	20	14 (35.9)
Q7e. Total insulin	21 (53.8)	6	10	5 (12.8)	14 (35.9)	2 (5.1)
Q7f. Needle removal	12	8	10	4	9	3 (7.7)
Q7g. Incorrect dose	20 (51.3)	8 (20.5)	10	4	13	4
Q8. Asepsis at the site	35	12	24	10	2	17
Q9. 70% alcohol	18	8	23	4	21	11 (28.2)
Q10. Skin fold	7	5 (12.8)	9 (23.1)	4 (10.3)	8 (20.5)	3 (7.7)
Q11. Syringe and needle	24 (61.5)	7	22	8	20	12 (30.8)
Q12. Scars	37 (94.9)	14	27	10	28	18
Q13a. Arm application	21	7	17	4	14	7
Q13b. Buttocks application	19	3	4	3	5	3 (7.7)
Q13c. Application on thighs	20 (51.3)	3	7	4	10	8 (20.5)
Q13d. Application abdomen	7	2 (5.1)	7	1	8	4

Source: The authors themselves (2024).

Given the data presented, it can be inferred that question Q4 and subitem Q13d had the highest error rate for the 5th period, referring to the homogenization of NPH insulin, which should be done with 20 gentle movements (rolling between the palms of the hands or in a pendulum motion) so that the insulin crystals enter into suspension, and to the application site on the abdomen, since the distance should be two fingers from the umbilical scar. For the 6th period, the question with the highest error rate was Q3 regarding the time to remove the insulin from the refrigerator to reduce pain and irritation, which should be 15 to 30 minutes. In the context of the 7th and 8th periods, both had the highest error rate for subitem Q6e, which assesses guidelines on asepsis and insulin preparation. Finally, for the 9th and 10th periods, the highest error rates were found in subitem Q13b, related to the appropriate site of application in the buttocks (upper outer quadrant), and Q7f, referring to guidelines for preparing NPH and Regular insulin in the same syringe, which reinforces the importance of not returning the excess to the vial.

About the highest rates of correct answers, there is extensive knowledge in the 5th, 7th, 9th, and 10th periods for item Q12, regarding contraindications for application in areas with scars, wounds, and lip hypertrophy. In the 6th period, the disposal of frozen insulin, referring to item Q2, represents the highest frequency of correct answers. Finally, in the 8th and 9th periods, most students answered item Q8 correctly, which clarifies the need for asepsis at the site of insulin therapy application.

CONCLUSION

The high rates of correct answers, in different periods, regarding issues related to the appropriate choice of application site, correct handling in case of frozen insulin, and the crucial importance of asepsis represent a good command of certain critical aspects of insulin therapy, demonstrating good coverage in the pharmacy students' curriculum. However, critical areas of knowledge need greater focus and reinforcement during teaching, such as insulin homogenization, correct selection of application sites, time of removal from the refrigerator, and needle protection, highlighting gaps that may have direct consequences in clinical practice, such as inadequate patient guidance, compromising glycemic control, and increasing the risk of complications associated with diabetes mellitus.

The relevance of these findings points to the need to reinforce the

theoretical and practical training of future physicians regarding insulin therapy, with a focus on patient safety and treatment efficacy. In addition, it is important to highlight the limitation of the study, since the absence of some students on the day of data collection may have impacted on the representativeness of the results. Thus, further studies are needed to identify and fill gaps in medical education, contributing to the development of more effective educational strategies tailored to the needs of students.

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