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ORIGINAL ARTICLE

The Efficacy of Shotblocker in Enhancing Patient Comfort and Reduces Pain During Subcutaneous Insulin Injections in Type 2 Diabetic Patients

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ABSTRACT

Background: Diabetes is a chronic illness that is very common, progressive, and incapacitating. Over the past 20 years, there has been a sharp increase in the global prevalence of diabetes.

Methods: This randomized controlled experimental study was conducted consisted of 66 patients (35 in Shotblocker Group, 31 in control group) who applied Subcutaneous Insulin Injections in Hospitalized Adults Patients with Type 2 Diabetes between September 2024 to January 2025. to examine the effect of the Shotblocker on the intensity of pain and the degree of patient satisfaction during the administration of subcutaneous insulin injections The study data were collected using the Structured Information Form, VAS for Pain and VAS for Satisfaction. The data were analyzed using descriptive and inferential statistics (SPSS version 27).

Results: The age of the participants included in this study ranged between 18 years and older with a mean age of the Shotblocker group 56.71±10.269 and mean age of the control group 51.71±16.584 of total study participants. Most of the participated was Female (71.4%) in the shotblocker group and male was (44.4%) in control group

Conclusions: Consort statement was followed for reporting. After the subcutaneous insulin injections, a significant difference was found between the groups in terms of the mean scores of VAS for pain and VAS for Injection Satisfaction ($p < .000$). It was determined that Shotblocker application was more effective in reducing the pain and in increasing satisfaction that occurs during of subcutaneous insulin injections according to the Shotblocker groups and control groups.

KEYWORDS

• Shotblocker • Pain Intensity • Patient Satisfaction • Type 2 Diabetes Mellitus

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INTRODUCTION

Diabetes is a chronic illness that is very common, progressive, and incapacitating. Over the past 20 years, there has been a sharp increase in the global prevalence of diabetes (Ibrahim *et al.,* 2024). Insulin is a vital hormone that plays a crucial role in regulating blood glucose levels. It is produced by the pancreas, acts as an anabolic hormone, and has many effects on lipid, protein, and carbohydrate metabolism. Insulin helps move glucose from the bloodstream into cells where it can be used for energy production or stored as glycogen in the liver and muscles. (Aslan *et al.,* 2023). Within the diverse array of classifications that encompass diabetes mellitus, it is type 2 diabetes mellitus that emerges as the most widespread and commonly encountered variant of this disease, The manifestation of type 2 diabetes mellitus predominantly originates from a phenomenon known as insulin resistance, which is further denoted by the presence of hyperglycemic states that mark the condition. (Kharroubi & Darwish, 2015) However, the administration of insulin injections is often accompanied by discomfort and pain, which leads to various difficulties in compliance with treatment. In particular, the experience of pain during insulin injections can significantly affect patients' adherence to treatment, leading to suboptimal disease management and reduced quality of life. Therefore, understanding the methods used by diabetic patients to alleviate injection pain and their subsequent adherence to treatment is crucial for optimizing patient care and outcomes (Lee, Ma, Lee, & Jung, 2018). Pain experienced during insulin injections is often a deterrent for patients, leading to a decrease in adherence to treatment and an increased risk of complications) Zijlstra, Jahnke, Fischer, Kapitza & Forst, 2018). As a result, patients may adopt a variety of strategies to relieve injection pain, as avoiding or reducing pain is their primary concern. (Puthrl *et al.,* 2022). Non-pharmacological methods cover a wider range of techniques and applications. Patients can use psychological interventions such as distraction techniques and deep breathing exercises to distract their attention from the pain associated with injections (Khan & Baig, 2022). In another study, insulin pain ranks first among the reasons for non-compliance with treatment (Kim, Shah, Buettner, 2022). Pain and anxiety are common conditions immediately after SC injection. The pain is often caused by inaccurate SC injections (Buyukyilmaz, Culha, Karaman, 2018). are as important as the individual's previous pain experiences. This may lead to tissue loss at the injection site subsequent injections of subcutaneously administered omalizumab every twenty-eight days and increase the stress level (Goncu *et al.,* 2016; Zuberbier *et al.,* 2014; Tat, 2018). Therefore, pain assessment and management should be taken into account considering the complicated nature of this experience (Bachi & AL-Fayyadh, 2022). When it comes to pain management, there are two main approaches: pharmacological interventions, which comprise medications, and non-pharmacological interventions, which include alternative techniques, like ShotBlocker (Yu *et al.,* 2023). These non-pharmacological techniques are regarded as safe, cost-effective, reusable, and require minimal procedural effort (EL-mahdy *et al.,* 2023). The ShotBlocker is specifically created to alleviate pain by redirecting the child's focus away from the discomfort of injections. The primary objective is to successfully divert attention, resulting in the child being oblivious to the sensation of pain (Hafez & Ali, 2023).

Despite the paramount significance of pain management in diabetes care, particularly during subcutaneous insulin injections, there exists a conspicuous deficiency in research focusing on non-pharmacological methods aimed at alleviating injection-related pain. Although current literature has examined a variety of non-pharmacological approaches, there has been a lack of specific inquiry into the effectiveness of ShotBlocker method. In light of the intricate nature of pain linked to insulin injections and the increasing interest in efficacious, non-invasive interventions, it is imperative to investigate the influence of these techniques on pain severity and patient satisfaction. Consequently, this study endeavors to analyze the effects of the ShotBlocker on pain intensity and patient satisfaction during subcutaneous insulin injections in hospitalized adult patients with type 2 diabetes.

MATERIALS AND METHODS

Study design and setting

This study employed a randomized controlled experimental study was conducted

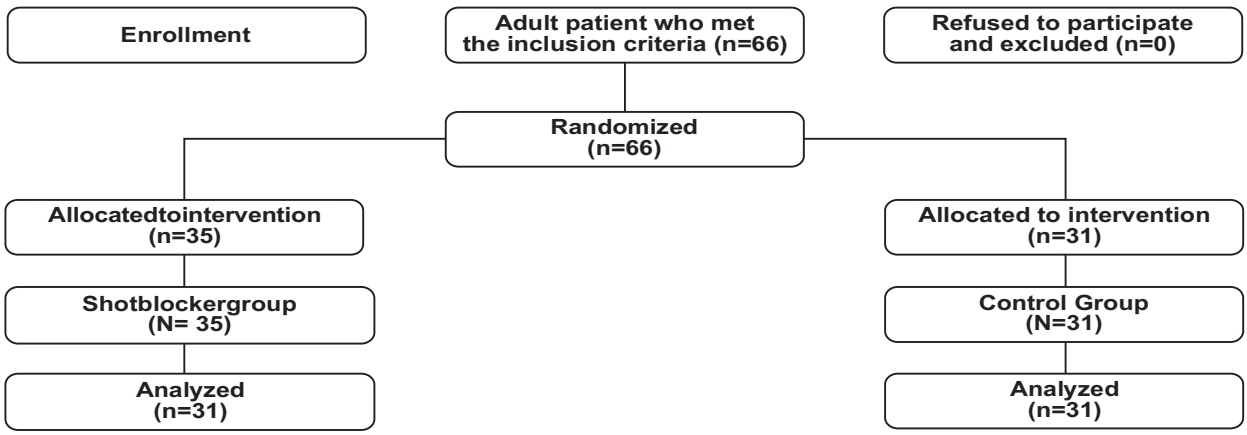
during the period from September 2024 to January 2025 in the subcutaneous insulin injections in hospitalized adult patients with type 2 diabetes in three hospitals belong to the Iraqi Ministry of Health and Environment in Karbala Province namely: Imam Al-Hasan Teaching Hospital, Al-Hindia Teaching Hospital, and Imam Al-Hussein Medical City.

The study participants and sampling procedure

The target population for this study was adults diagnosed with Type 2 diabetes who are receiving subcutaneous insulin injections. areas at the selected hospitals from the selected hospitals. A purposive sample was used to select participants from the selected hospitals units. The total sample sizes 66 patients (35 in Shotblocker Group, 31 in control group) with an 80% confidence level, 5 margin of error, and 500 population size. A paperbased selfreport questionnaire was employed in the investigation. Upon enrollment, each nurse was given a survey package containing the study instruments, an information page, and a consent form. The researcher also gave a verbal explanation of the study's objectives and methodology. A total of 66 participants were asked to answer the survey. receiving subcutaneous insulin injections.

Inclusion Criteria: Participants must be adults diagnosed with Type 2 diabetes currently admitted to a hospital, at least 18 years of age or older, alert and capable of providing informed consent, Participants should possess the ability to comprehend and follow verbal instructions, undergoing regular subcutaneous insulin injections, must not have utilized any analgesic medications for a minimum of 8 hours prior to the injection.

Exclusion Criteria: Patients diagnosed with Type 2 diabetes for a duration of 10 years or more, suffered trauma near the injection site, Patients exhibiting cognitive impairments or mental health disorders that hinder their capacity to understand or provide consent, Patients presenting with active infections or complications at the injection site.



Data Collection Tools

The study data were collected using the Structured Information Form, which was prepared and consisted of Group questions, and VAS for Pain and VAS for Satisfaction. Structured Information Form: Five questions about the descriptive characteristics of the participants (age, gender, occupation, educational level, marital status). Visual Analog Pain Scale (VAS): The Visual Analog Scale, developed by Huskisson (1974), is accepted as a secure, valid, and applicable pain measurement tool in repetitive measurements. On a 10-cm long horizontal line, there are definitions of "no pain" at the left end and "unbearable pain" at the right end. The patient is asked to mark the point on this line that best expresses his/her pain severity. The distance of the patient's sign to the left end is measured. This distance, usually measured in millimeters, is interpreted as "points" (Aslan, 2002, Suldur, 2001; Bijur, Silver, & Gallagher, 2001). Reliability of the pain scale for acute pain was ensured by (Kılınçer & Zileli, 2006). Visual Satisfaction Scale: Because satisfaction is a subjective condition such as pain, Visual Satisfaction Scale was used to evaluate satisfaction. In the visual satisfaction scale, as in

the pain scale, the degree of patient satisfaction increases from left to right. The fact that the pain severity increases, while the satisfaction level decreases create contrary situation to one another, and hence the subsequent application of scales can be confusing for some patients. In order to prevent this situation, a vertical orientation is preferred in the satisfaction scale. There is the statement "Strongly dissatisfied" at the lower end of the line, and "Strongly satisfied" at the upper end. The measured distance is interpreted as "points" (Kılınçer & Zileli, 2006). The scale is widely used to evaluate satisfaction.

Data Collection

Verbal information was given to the participants prior to the subcutaneous insulin injections, and their written consents were obtained. The "Structured Information Form" (Majeed, Hassan, & Mousa, 2024). consisting of questions was applied by face-to-face interview method. and recorded in the "Structured Information Form, and using Visual Analog Pain Scale (VAS) for pain measurement tool and Visual Satisfaction Scale to evaluate satisfaction.

The Shot Blocker is a compact, flat, U-shaped plastic apparatus, with a thickness of 2mm, featuring rounded nubs designed to stimulate the skin surrounding the injection site. The ShotBlocker is applied to the skin during the administration of injections. This device potentially facilitates expedited stimulation of nerve endings due to the presence of its rounded nubs. Such stimulation is purported to alleviate pain by obstructing the perception of pain and its transmission to the central nervous system through the temporary inhibition of peripheral nerve endings. (Cobb & Cohen, 2009, Kara, 2013) Numerous studies have investigated the impact of the Shot Blocker on pain reduction. (Celik & Khorshid, 2015, Gundrum, Sherman, & Ruhlman, 2005).

Before the drug was prepared, the physician's request was checked by the researcher. Hands were washed, the drug insulin was prepared. The patient was initially, the investigator will secure informed consent from all participants, ensuring that they possess comprehensive knowledge regarding the study's objectives and provide either oral or written consent. The confidentiality of participant information will be rigorously upheld (Majeed & Atiyah, 2021, Hassan, Majeed, & Isam, 2024, Hassan, Majeed & Jasim, 2020, Mohammed, Majeed & Abid, 2020). The skin surface in the area where SC injection would be applied was observed for ecchymosis, scar, inflammation, or edema by the research specialist nurse. The presence of tenderness or stiffness was evaluated by palpation, paying attention to muscle integrity. For the patient group that was applied Shotblocker Technique prior to the insertion of the needle. The injection procedure will transpire through the aperture present in the device, which will be securely maintained in position throughout the intervention. Prior to the procedure, the injection site will undergo disinfection utilizing alcohol, and the same investigator will execute the injection at a standardized angle, specifically utilizing the upper arm. The hands of the investigator will also be disinfected with alcohol prior to the administration of the injection. The intensity of pain and the degree of patient satisfaction will be evaluated immediately subsequent to the needle insertion employing the Visual Analog Scale (VAS) and the Visual Image Scale (VISS), respectively.

Statistical Analysis

Data were analyzed through the use of statistical package of social sciences (SPSS) version 27. The statistical procedures, which were applied for data analysis and assessment of results, included the following: Descriptive Statistics Frequency (F), Percentage (%), Mean Score and standard deviation to calculate demographic characteristic ((Mohammed, Majeed, & Jasim, 2020. Al-Ganmi, Majeed, & Najm, 2024. Majeed, Hassan, & Al Ganmi, 2024). Kruskal-Wallis Test used to determine statistically significant difference between study groups: The ShotBlocker is a compact, flat, U-shaped plastic apparatus, with a thickness of 2mm, featuring rounded nubs designed to stimulate the skin surrounding the injection site. The ShotBlocker is applied to the skin during the administration of injections. This device potentially facilitates expedited stimulation of nerve endings due to the presence of its rounded nubs. Such stimulation is purported to alleviate pain by obstructing the perception of pain and its transmission to the central nervous system through the temporary inhibition of peripheral nerve endings. (Cobb & Cohen, 2009, Kara, 2013) Numerous studies have investigated the impact of the ShotBlocker on pain reduction.

(Celik & Khorshid, 2015, Gundrum, Sherman, & Ruhlman, 2005) and control regarding pain score and satisfaction score with Subcutaneous insulin injection. Mann-Whitney Test used to find statistically significant difference between groups (shotblocker and control). Chi-square correlation relationships between socio-demographic variables and both the level of pain and level of satisfaction Kruskal-Wallis H test was used to find out difference between three study groups regarding pain and Satisfaction score.

RESULTS

Table (1) reveals that the frequency counts for selected variables for two groups (Shotblocker group, Control Group) were not equal in number. Ages of the participant are ranged from 18 to 80 years old (mean age of the Shotblocker group 56.71±10.269 and mean age of the control group 51.71±16.584). Most of those that participated of age group (48-57) in the study was (54.3%) in shotblocker group and rang of age was 58 and above (41.9%) control group. Regarding marital status (68.6%) in the shotblocker group were married and (61.3%) control group were also married. According to educational level, nearly third (34.3%) of shotblocker group participants were Illiterate and (32.3%) in control group was Primary Graduate. Regarding sex Most of the participated was Female (71.4%) in the shotblocker group and male was (54.8%) in control group. According to occupation Most of the participated was Housewife (60.0%) in shotblocker group and was (38.7%) in control group.

Table 1: Sociodemographic information of Study participants (Shotblocker Group and Control Groups)

Demographic Variables	Shotblocker group	Control Group
	M ± SD	M ± SD
	N (%)	N (%)
Age	56.71±10.269	51.71±16.584
Age groups		
18-27	0 (0%)	3 (9.7%)
28-37	2 (5.7%)	2 (6.5%)
38-47	1 (2.9%)	4 (12.9%)
48-57	19 (54.3%)	4 (29.0%)
58 and above	13 (37.1%)	13 (41.9%)
Total	35 (100.0%)	31 (100.0%)
Marital status		
Single	0 (0%)	7 (22.6%)
Married	24 (68.6%)	19 (61.3%)
Divorced	1 (2.9%)	1 (3.2%)
Widowed	10 (28.6%)	4 (12.9%)
Total	35 (100.0%)	31 (100.0%)
Educational level		
Illiterate	12 (34.3%)	9 (29.0%)
Read and write	7 (20.0%)	2 (6.5%)
Primary Graduate	9 (25.7%)	10 (32.3%)
Intermediate Graduate	4 (11.4%)	5 (16.1%)
Secondary Graduate	0 (0%)	2 (6.5%)
Diploma Graduate	3 (8.6%)	0 (0%)
Bachelor	0 (0%)	3 (9.7%)
Total	35 (100.0%)	31 (100.0%)
Sex		
Male	10 (28.6%)	17 (54.8%)
Female	25 (71.4%)	14 (45.2%)
Total	35 (100.0%)	31 (100.0%)
Occupation		
Employed	3 (8.6%)	8 (25.8%)
Unemployed	4 (11.4%)	3 (9.7%)
Retired	5 (14.3%)	4 (12.9%)
Student	2 (5.7%)	4 (12.9%)
Housewife	21 (60.0%)	12 (38.7%)
Total	35 (100.0%)	31 (100.0%)

F=Frequency, %=Percent

Table 2 Mann-Whitney U tested difference between study groups: Control with Shotblocker regarding pain score with injection. The results in this table show that There are statistically significant differences between Control and Shotblocker regarding pain score with injection at (p=.000).

Table 2: Differences between control with shotblocker device and control with shot blocker regarding pain reducing level score

Pain Score			
Group	**N**	**Mean Rank**	**Sig.**
Control	31	46.55	000
Shotblocker	35	21.94	

Table 3: Mann-Whitney U tested difference between study groups Control with Shotblocker regarding Satisfaction score with injection. The results in this table show that

There are statistically significant differences between Control and Shotblocker regarding Satisfaction score with injection at (p=.000).

Table 3: Differences between control with shotblocker regarding patients satisfaction score

Satisfaction Score			
Group	**N**	**Mean Rank**	**Sig.**
Control	31	23.77	.000
Shot-blocker	35	42.11	

Table 4: shows the results of Pearson Chi-Square tests analyzing the relationships between socio-demographic variables and both the level of pain during insulin injections across two different groups: Control Group, Shotblocker Group. There is no statistically significant difference between the groups based on Age Group, Sex, Educational Level, Occupation, in most cases. Marital Status: There are statistically significant differences between the Control Group and marital status (0.000).

Table 4: Association between socio-demographic characteristics and level of pain and related to needle reduction during subcutaneous insulin injection among adult patient type 2 diabetes mellites for all groups by using pearson Chi-Square

Variables	Pearson Chi-Square			
	Control Group		Shot blocker Group	
Sociodemographic	χ2	Sig	χ2	Sig
Age Group	10.743	.551	7.360	.600
Sex	2.880	.411	4.587	.205
Educational level	22.032	.107	11.876	.456
Marital status	32.282	.000	6.889	.331
Occupation	13.009	.368	13.367	.343

χ2 = Chi-Square, Sig = significant, *Significant at p < 0.05. **highly significant at p < 0.01.

Table 5: shows the results of Pearson Chi-Square tests analyzing the relationships between socio-demographic variables and level of satisfaction during insulin injections across two different groups: (Control Group, Shotblocker Group): There are no statistically significant differences between the age groups, sex, educational level, marital status, occupation but in marital status there is a statistically significant difference in the control group regarding marital status (p=0.000).

Table 5: Association between socio-demographic characteristics and level of satisfaction related to needle reduction during subcutaneous insulin injection among adult patient type 2 diabetes mellites for all groups by using pearson Chi-Square

level of satisfaction	Pearson Chi-Square			
	Control Group		Shot blocker Group	
Socio-demographic	χ2	Sig	χ2	Sig
Age Group	14.263	.284	13.408	.145
Sex	3.139	.371	1.167	.761
Educational level	14.455	.491	11.958	.449
Marital status	35.133	.000	6.354	.385
Occupation	13.505	.333	6.282	.901

χ2 = Chi-Square, Sig = significant, *Significant at p < 0.05. **highly significant at p < 0.01.

Table 6 presents a comparison of pain levels across three groups (Control, Shotblocker) in relation to their experiences with pain following therapeutic interventions. The results indicate that the majority of participants in the control group experienced moderate pain (90.3%), whereas the intervention groups (Shotblocker) showed a notable reduction in pain levels. the Shotblocker group had a high percentage of participants reporting no pain (45.2%) compared to the control group (3.2%). These findings suggest that the therapeutic interventions in the three experimental groups had a positive effect in reducing pain compared to the control group.

Table 6: Descriptive analysis patients pain level related to needle reduction pain during subcutaneous insulin injection among adult patient type 2 diabetes mellites for all groups by using pearson Chi-Square

Item	Control group		Shot blocker group	
	F	%	F	%
No pain	1	3.2%	14	45.2%
Mild pain	1	3.2%	8	25.8%
Moderate pain	2	90.3%	2	6.5%
Sever pain	1	3.2%	0	0%

F=Frequency, %=Percent

Table 7 presents a comparison of satisfaction levels across three groups (Control, Shotblocker) in relation to their experiences with satisfaction following therapeutic interventions. There 35.6% of participants expressing very severe satisfaction in the Shotblocker group, compared to only 22.2% in the control group. Interestingly, the

Shotblocker group also had a high percentage of sever satisfaction (37.8%), indicating the effectiveness of the interventions in improving satisfaction levels.

Table 7: Descriptive analysis patients satisfaction level related to needle reduction pain during subcutaneous insulin injection among adult patient type 2 diabetes mellites for all groups by using pearson Chi-Square

Item	Control Group		Shot-blocker Group	
	F	%	F	%
No satisfy	0	0	0	0
Mild satisfy	2	4.4	0	2.2
Moderate satisfy	18	40.0	6.7	13.3
Sever satisfy	10	22.2	37.8	31.1
Very sever worst satisfy	1	2.2	35.6	31.1

F=Frequency, %=Percent

DISCUSSION

Pain and anxiety are prevalent phenomena observed immediately following subcutaneous (SC) injections. The discomfort is frequently attributable to improper SC injection techniques (Usichenko *et al.,* 2019)

The average age of the participants ranged from 18 to 80, the average age of the ShotBlocker group was 56.71 ±10.269 and the mean age of the control group was 51.71 ± 16.584. the participants were Female (71.4%) in the shotblocker group, in contrast to the outcomes of this investigation, a study carried out in Iraq found that the 80% of nurses in the study group were female. (Sakran & Al-Mosawi, 2024) and male was (54.8%) in control group, When the literature is examined, it has been concluded that many patients Male (AL-Shammary & Sadeq, 2024), (68.6%) of the participants in the shotblocker group were married and (61.3%) control group were also married These results came in contrast with (Al-Fahham, Al-Jubouri, & Al Omari, 2024). Most of the participated was Housewife (60.0%) in shotblocker group and was (38.7%) in control group, A study conducted similar these the results (Mohammed & Mohammed, 2024). According to educational level, nearly third (34.3%) of shotblocker group participants were Illiterate and (32.3%) in control group was Primary Graduate Similar student conduct by (Khudhair & Ahmed, 2022).

Consequently, it is imperative to conduct research aimed at identifying an effective and easily implementable technique, due to the ambiguities surrounding which method should be employed to mitigate pain and enhance satisfaction during the administration of subcutaneous insulin injections. This consideration is particularly relevant in the context of high work pressure, swift patient turnover, a substantial patient load, and the constraints of time, particularly for healthcare professionals engaged in surgical clinics. In this context, the findings of the present study indicated that the medium intensity Shotblocker device employed during subcutaneous insulin injections significantly attenuated the severity of pain reported by patients, as compared to injections administered via the standard technique. A review of the literature revealed no studies specifically investigating the impact of these techniques on the administration of subcutaneous insulin injections; however, it was noted that these methods had been addressed in relation to pain management associated with other invasive nursing procedures. This investigation established that the Shotblocker was more effective in reducing pain and enhancing satisfaction than the control group. During the administration of subcutaneous insulin injections. Similarly, a study investigated the effect in a study on the subject, it was concluded that the Shotblocker was effective in reducing pain during peripheral intravenous catheterization, and was an equivalent technique to the method of complex distraction (Yılmaz & Güneş, 2018). From this information, it can be said that the ShotBlocker is effective in reducing the pain arising from subcutaneous insulin injections, depending on the potential mechanisms mentioned above. found in their study that ShotBlocker application was effective in reducing pain arising from IM injection (Romano & Cecca, 2005). In the study it was reported that the pain during IM injection using ShotBlocker was significantly less than the control and placebo groups (Celik & Khorshid, 2015). In studies using ShotBlocker in IM injection application, it was determined that Shot Blocker reduced injection-related pain and increased patient satisfaction (Agac & Yapucu Gunes, 2011, Aydın & Avsar, 2019). However, in the study conducted by Cobb and Cohen, Shot Blocker was also used in reducing pain during vaccination in children

but Shot Blocker was found to be ineffective in reducing intramuscular injection pain (Cobb & Cohen, 2009). Similar results have been achieved in most of the studies using shot-blocker, and the satisfaction levels of the shot-blocker group were higher than other injection methods (Romano & Cecca, 2005, Canbulat Sahiner et al., 2018). When the correlation between the pain scores (VAS) and Injection Satisfaction Scores (VAS) of the groups was examined, a statistically significant negative correlation was found in all groups. The ShotBlocker groups had lower perceived pain scores for Subcutaneous Insulin Injections for Adults Patients with Type 2 Diabetes mellitus injections, and their satisfaction levels increased. The control group's perceived pain scores increased, and their satisfaction scores decreased. Therefore, shotblocker are effective as, it, too, reduces the pain of Subcutaneous Insulin Injections and increases satisfaction.

Limitations and Strengths of the Study

The low number of participants are and the use of techniques and lack of knowledge limitations of the study. This study has a single-center design, therefore, the results be generalized to the overall population. On the other hand, patients were randomly assigned to the groups.

CONCLUSIONS

This study demonstrates evidence supporting the Effect of ShotBlocker Technique on Pain and Satisfaction During Subcutaneous Insulin Injections for Adults Patients with Type 2 Diabetes mellitus, despite the lack of significant effect on demographic characteristics. These findings highlight the potential of The ShotBlocker is a compact, flat, U-shaped plastic apparatus, with a thickness of 2mm, featuring rounded nubs designed to stimulate the skin surrounding the injection site. The ShotBlocker is applied to the skin during the administration of injections. This device potentially facilitates expedited stimulation of nerve endings due to the presence of its rounded nubs. Such stimulation is purported to alleviate pain by obstructing the perception of pain and its transmission to the central nervous system through the temporary inhibition of peripheral nerve endings. (Cobb & Cohen, 2009, Kara, 2013) Numerous studies have investigated the impact of the ShotBlocker on pain reduction. (Celik & Khorshid, 2015, Gundrum, Sherman, & Ruhlman, 2005). as an easily implemented, low-cost, and non-invasive intervention to improve pain management techniques and satisfaction in medical settings. Overall, the integration of ShotBlocker Technique into clinical practice exhibits the potential to enhance patient comfort and contentment throughout Subcutaneous Insulin Injections, leading to improved patient care and results in the long run. That facilitates nurses to provide comfort through simple methods of pain management and satisfaction for patients.

RESEARCH QUALITY AND ETHICS STATEMENT

This study was approved by the Ethics Committee of the University of Baghdad/ College of Nursing and Ethics Review Committee for conducting the study (Date/ Number: 28.10.2024/6) was obtained from the health institution where the study would be conducted. In accordance with the Helsinki Declaration, the patients were informed that the study data would only be used in the study, and that their privacy would be ensured. Their written con- sent was obtained. The study was registered in Clinical Trials registration: The IRCT code for the trial, which was entered into the Clinical Trial Register (80126), was IRCT20241103063580N1. We followed all guidelines set forth by the World Medical Association's Declaration of Helsinki before the first participant was recruited.

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