



# The effect of feedback-based education on self-efficacy and treatment adherence in elderly diabetic patients after surgery visiting the hospital

136

El efecto de la educación basada en la retroalimentación sobre la autoeficacia y la adherencia al tratamiento en pacientes diabéticos de edad avanzada después de una cirugía que visitan el hospital

Mohammad Nabizade, Department of Psychology, Isfahan University, Isfahan, Iran, <https://orcid.org/0009-0006-5773-9019>, Email: Mo.nabizadeh26@gmail.com

Mehdi Mokhtari, PhD in Epidemiology, Assistant Professor of Epidemiology, Khoy University of Medical Sciences, Khoy, Iran, <https://orcid.org/0000-0002-4022-7440>, Email: mokhtari\_ma@khoyums.ac.ir

Parivash Hafez Amin, PhD in Physiology, Department of Physiology, Faculty of Medicine, Istanbul Atlas University, Istanbul, Turkey, <https://orcid.org/0009-0000-2530-4359>, Email: parivash.amini@atlas.edu.tr

Rafat Rezapour-Nasrabad, Associate professor, Department of Psychiatric Nursing and Management, School of Nursing and Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran, <https://orcid.org/0000-0002-7157-586X>, Email: Rezapour.r@sbm.ac.ir

Fatemeh Kafami Ladani, PHD in Nursing, Intensive Care Unit, Shariati Hospital, Social Security Organization, Isfahan, Iran, <https://orcid.org/0000-0003-2054-6839>, Email: Nazi\_kafame@yahoo.com

Mohammad Bakhtiari, Department of Anaesthesiology, Sirjan Faculty of Medical Sciences, Sirjan, Iran, <https://orcid.org/0000-0002-1104-0281>, Email: m.bakhtiyari@sirums.ac.ir

Razieh Nouzari, Department of Nursing, Shiraz University of Medical Sciences, Shiraz, Iran, <https://orcid.org/0009-0007-6277-9354>, Email: Raziyeznouzari@gmail.com

Shima Daman, Department of Nursing, School of Nursing & Midwifery, Jahrom University of Medical Sciences, Jahrom, Iran, <https://orcid.org/0000-0002-1446-8048>, Email: Daman.shima@gmail.com

\*Corresponding Author: Shima Daman, Department of Nursing, School of Nursing & Midwifery, Jahrom University of Medical Sciences, Jahrom, Iran, <https://orcid.org/0000-0002-1446-8048>, Email: Daman.shima@gmail.com

Received: 01/20/2025 Accepted: 03/19/2025 Published: 04/12/2025 DOI: <http://doi.org/10.5281/zenodo.15151388>

## Abstract

**Introduction:** The aim of this study was to investigate the effect of feedback-based education on self-efficacy and treatment adherence in elderly diabetic patients after surgery.

**Methods:** This quasi-experimental study used a pre-test and post-test design and was conducted on 80 elderly diabetic patients who visited the hospital after surgery. The participants were randomly assigned into two groups: experimental (40 participants) and control (40 participants). The experimental group received feedback-based education regarding postoperative care and diabetes management, while the control group received standard education. Self-efficacy and treatment adherence were assessed before and after the intervention using validated scales.

**Results:** The results showed that feedback-based education significantly increased self-efficacy in the patients ( $P < 0.001$ ), and this increase in self-efficacy led to improved treatment adherence ( $P < 0.001$ ). Structural equation modeling analysis revealed that self-efficacy significantly mediated the association between feedback-based education and treatment adherence.

**Conclusion:** The findings of this study indicate the effectiveness of feedback-based education in enhancing self-efficacy and treatment adherence in elderly diabetic patients after surgery. It can be suggested as an effective strategy for improving healthcare for this group of patients.

**Keywords:** Feedback-based education, self-efficacy, treatment adherence, diabetes, elderly.

**Introducción y antecedentes.** El objetivo de este estudio fue investigar el efecto de la educación basada en la retroalimentación sobre la autoeficacia y la adherencia al tratamiento en pacientes diabéticos de edad avanzada después de la cirugía.

**Métodos.** Este estudio cuasiexperimental, con un diseño pre-test y post-test, se llevó a cabo en 80 pacientes diabéticos de edad avanzada que acudieron al hospital tras una cirugía. Los participantes se asignaron aleatoriamente a dos grupos: experimental (40 participantes) y control (40 participantes). El grupo experimental recibió retroalimentación sobre los cuidados postoperatorios y el manejo de la diabetes, mientras que el grupo control recibió educación estándar. La autoeficacia y la adherencia al tratamiento se evaluaron antes y después de la intervención mediante escalas validadas.

**Resultados.** Los resultados mostraron que la educación basada en la retroalimentación aumentó significativamente la autoeficacia de los pacientes ( $P < 0,001$ ), y este aumento de la autoeficacia condujo a una mejor adherencia al tratamiento ( $P < 0,001$ ). El análisis de modelos de ecuaciones estructurales reveló que la autoeficacia mediaba significativamente la asociación entre la educación basada en la retroalimentación y la adherencia al tratamiento.

**Conclusión.** Los hallazgos de este estudio indican la eficacia de la educación basada en la retroalimentación para mejorar la autoeficacia y la adherencia al tratamiento en pacientes diabéticos de edad avanzada tras la cirugía. Se puede sugerir como una estrategia eficaz para mejorar la atención médica de este grupo de pacientes.

**Palabras clave:** Educación basada en la retroalimentación, autoeficacia, adherencia al tratamiento, diabetes, ancianos.

**D**iabetes is one of the most common chronic diseases in the elderly, and its management becomes more difficult with age<sup>1</sup>. This chronic condition can affect the quality of life of patients and raise the risk of complications such as cardiovascular diseases, neuropathy, and infections. Additionally, elderly individuals with diabetes often undergo various surgeries due to other health issues<sup>2</sup>. Surgery in these patients, especially if blood sugar control is sub-optimal, can increase the risk of postoperative complications such as delayed wound healing, postoperative infections, and sudden changes in blood glucose levels<sup>3</sup>.

A major challenge in managing elderly diabetics is inadequate adherence to prescribed treatments. Various factors, such as the complexity of medication regimens, cognitive issues, and lack of self-efficacy in disease management, can reduce treatment adherence<sup>4</sup>. Self-efficacy, a key component in Bandura's Social Cognitive Theory, plays a central role in behavior change and is linked to an individual's belief in their ability to manage the disease. Studies have shown that increasing self-efficacy can lead to improved adherence to treatment and reduced complications related to diabetes<sup>5</sup>.

Feedback-based education is an innovative teaching method that uses continuous feedback to enhance patients' understanding and capabilities. This type of education increases patients' ability to manage their condition effectively and can lead to better treatment outcomes. While the impact of this educational method has been studied in various health fields, few studies have explored its role in improving self-efficacy and treatment adherence in elderly diabetic patients after surgery<sup>6</sup>.

This study aims to investigate the effect of feedback-based education on self-efficacy and treatment adherence in elderly patients with diabetes after surgery. The results of this research could provide new scientific evidence to improve diabetes management strategies in this vulnerable group. The focus on postoperative diabetic patients is due to the fact that elderly diabetics face additional challenges such as wound infections, blood sugar control issues, and physical weakness. These conditions may require more precise management and adherence to treatment. This period after surgery provides a critical opportunity for educational interventions, as patients are in both physical and psychological conditions where education may have a greater impact. Moreover, this period is particularly sensitive to treatment adherence and self-efficacy.

## Study Design

This is a quasi-experimental study with a pre-test-post-test design. The study population consisted of elderly patients with type 2 diabetes who had undergone general or orthopedic surgeries and visited public or private hospitals. Using Cochran's formula and considering the potential for sample loss, 80 participants were randomly selected (40 in the intervention group and 40 in the control group). Eligible participants were randomly assigned to the intervention group (40 participants) and the control group (40 participants) using simple randomization (random number table).

### Inclusion Criteria

- Aged 60 years or older.
- A confirmed diagnosis of type 2 diabetes (based on medical records).
- Underwent surgery in the past 6 months.
- Ability to participate in educational sessions and complete questionnaires.

### Exclusion Criteria

- Severe cognitive disorders or confirmed psychiatric illnesses.
- Lack of willingness to participate in the study.
- Rehospitalization due to acute surgical complications.

### Data Collection Tool

#### 1. General Self-Efficacy Scale (GSE):

This tool includes 10 items and is scored using a 4-point Likert scale (1 = strongly disagree to 4 = strongly agree). The reliability of this tool in the current study was reported as 0.85 using Cronbach's alpha.

#### 2. Treatment Adherence Checklist

This includes three sections: medication adherence (according to the doctor's prescription), adherence to the diet, and follow-up of treatment sessions. Scoring was based on patient self-report and physician report.

### Educational Intervention

- The intervention group received feedback-based education, consisting of two 60-minute sessions over two weeks.

#### • Educational Content:

1. General information about diabetes and blood sugar control.
2. Post-surgery diabetes management strategies (diet, physical activity, blood glucose monitoring).

3. Use of digital tools (such as glucometers).

4. Review of individual and group feedback on patients' progress.

The sessions were conducted in person with the help of PowerPoint presentations and educational videos. Individual feedback and encouragement for sharing personal experiences were key components of the education.

The control group received only standard hospital care.

### Sample Selection Method

#### Hospital Visit

The researcher, in collaboration with treating physicians and ward nurses, compiled a list of elderly diabetic patients who had undergone surgery in the past six months. These patients were from the general surgery, orthopedic, and gastroenterology wards.

### Educational Program Design

#### • Needs-Based Design

To ensure the educational content was relevant, consultative sessions were held with the treatment team (including the physician, diabetes nurse, and nutritionist). The program was tailored to address the primary challenges faced by elderly diabetics, particularly in blood sugar management post-surgery.

#### • Educational Session Content

**1.Session 1:** Introduction to diabetes and its impact on postoperative recovery, importance of medication and non-medication adherence, practical training on blood glucose management (using a glucometer), dietary considerations post-surgery, and identifying symptoms of hypoglycemia or hyperglycemia.

**2.Session 2:** Focus on physical activity suited to postoperative conditions, review of common barriers to treatment adherence and solutions, individual feedback on patient performance, and encouragement for continued active disease management.

### Data Collection Method

#### • Pre-test:

Before the first educational session, all participants (both intervention and control groups) completed the General Self-Efficacy Scale and the Treatment Adherence Checklist.

#### • Post-test:

Two months after the educational intervention, the same tools were completed again to assess the lasting impact of the education.

### Statistical Analysis

- Data were analyzed using SPSS software version 25.

- Statistical tests used included:
- **Independent t-test:** To compare means between the intervention and control groups.
- **Paired t-test:** To assess within-group changes from pre-test to post-test.
- **ANCOVA (Analysis of Covariance):** To evaluate the intervention's effect while controlling for confounding variables.
- A significance level of  $< 0.05$  was considered for all tests.

### Demographic and Clinical Characteristics of the Participants:

In total, 80 elderly patients with type 2 diabetes who underwent surgery participated in the study. The average age of the intervention group was 68.5 years (SD 7.3), and in the control group, it was 70.2 years (SD 6.8). Regarding gender, 55% of the participants were male and 45% were female. Seventy percent of the patients had orthopedic surgeries, while 30% had general surgeries. Analysis of the demographic characteristics showed no significant differences in demographic and clinical features between the intervention and control groups ( $P>0.05$ ).

Table 1 displays the demographic characteristics of the participants.

Characteristic	Intervention Group (n=40)	Control Group (n=40)
Age (mean $\pm$ SD)	68.5 $\pm$ 7.3	70.2 $\pm$ 6.8
Gender (Male/Female)	55% / 45%	55% / 45%
Type of Surgery	70% orthopedic, 30% general	65% orthopedic, 35% general

### Changes in Self-Efficacy

The results showed that the mean self-efficacy scores in the intervention group before the intervention were 21.3 (SD=3.4), and after the intervention, it increased to 29.1 (SD=4.1). In the control group, the self-efficacy scores increased from 22.5 (SD=3.5) to 23.2 (SD=3.8). Paired t-test analysis revealed that the change in self-efficacy scores in the intervention group was significantly greater than that in the control group ( $P<0.01$ ). Additionally, an independent t-test showed that there was a significant difference in self-efficacy scores between the two groups after the intervention ( $P<0.05$ ) in Table 2.

Table 2. Changes in Self-Efficacy Scores in Pre-test and Post-test

Group	Pre-test (mean $\pm$ SD)	Post-test (mean $\pm$ SD)	Change (P-value)
Intervention Group	21.3 $\pm$ 3.4	29.1 $\pm$ 4.1	$P<0.01$
Control Group	22.5 $\pm$ 3.5	23.2 $\pm$ 3.8	$P>0.05$

### Treatment Adherence

In the intervention group, treatment adherence (including adherence to medication, diet, and follow-up treatment) was 70% (SD=12.2) before the intervention, and after the intervention, it increased to 85% (SD=10.1). In the control group, treatment adherence changed from 72% (SD =13.3) to 75% (SD=12.5). ANCOVA analysis showed that after controlling for confounding variables (age, gender, type of surgery), there was a significant difference in treatment adherence between the two groups ( $P<0.05$ ) in Table 3.

Table 3. Changes in Treatment Adherence in Pre-test and Post-test

Group	Pre-test (%)	Post-test (%)	Change (P-value)
Intervention Group	70 $\pm$ 12.2	85 $\pm$ 10.1	$P<0.01$
Control Group	72 $\pm$ 13.3	75 $\pm$ 12.5	$P>0.05$

### Impact of Feedback-Based Education on Surgical Complications

In the intervention group, 10% of the patients experienced complications related to blood sugar (such as severe hypoglycemia or hyperglycemia) after surgery, while in the control group, this rate was 25%. This difference was statistically significant ( $P<0.05$ ), indicating a positive effect of feedback-based education in improving blood sugar management post-surgery in Table 4.

Table 4. Percentage of Surgical Complications in the Intervention and Control Groups

Group	Percentage of Surgical Complications (%)	P-value
Intervention Group	10%	$P<0.05$
Control Group	25%	-

### Structural Equation Modeling (SEM)

The model aimed to examine the effect of feedback-based education on self-efficacy and, subsequently, its impact on treatment adherence. Implicitly, the model indicates that feedback-based education has a direct effect on self-efficacy, which in turn increases treatment adherence. Furthermore, feedback-based education could have an indirect effect on treatment adherence through increased self-efficacy.

The results showed that feedback-based education had a strong and direct effect on increasing self-efficacy ( $\beta=0.75$ ). This highlights the importance of education



and feedback in improving patients' confidence in their ability to manage diabetes. Additionally, self-efficacy had a significant effect on treatment adherence ( $\beta=0.65$ ). Patients with higher self-efficacy were more likely to adhere to treatment. Feedback-based education also had a direct and significant effect on treatment adherence ( $\beta=0.35$ ), suggesting that even without considering the effect of self-efficacy, feedback-based education can directly improve treatment adherence. The indirect effect of feedback-based education on treatment adherence through self-efficacy was significantly larger ( $\beta=0.49$ ), suggesting that much of the effect of education on treatment adherence is mediated through increased self-efficacy in Table 5.

**Table 5. Path Coefficients**

Path	Path Coefficient	t-Value	(P-value)
Feedback-based education → Self-efficacy	0.75	8.65	<0.001
Self-efficacy → Treatment adherence	0.65	7.22	<0.001
Feedback-based education → Treatment adherence	0.35	2.45	0.01
Feedback-based education → Treatment adherence (Indirect via Self-efficacy)	0.49	-	<0.001

This Table 6 includes the path coefficients between variables (i.e., direct and indirect effects) in the SEM model.

**Table 6. Standardized Path Coefficients**

Path	Standardized Path Coefficient	(P-value)
Feedback-based education → Self-efficacy	0.78	<0.001
Self-efficacy → Treatment adherence	0.60	<0.001
Feedback-based education → Treatment adherence	0.38	0.01

**Table 6** shows that feedback-based education has a direct impact on self-efficacy (with a coefficient of 0.78) and also directly impacts treatment adherence (with a coefficient of 0.38). Additionally, self-efficacy as a mediating variable significantly impacts treatment adherence (with a coefficient of 0.60). These standardized coefficients confirm the importance of association between variables in the model.

This study aimed to examine the impact of feedback-based education on self-efficacy and treatment adherence in elderly diabetic patients post-surgery. The results of this research indicate that feedback-based education has a significant effect on increasing both self-efficacy and treatment adherence in this group of patients. In this section, based on the findings, we will analyze the importance of these results within the framework of existing theories and previous research.

The results of this study showed that feedback-based education led to an increase in self-efficacy in elderly diabetic patients after surgery. These findings align with previous research highlighting the importance of education in strengthening patients' sense of self-efficacy<sup>7,8</sup>. Feedback-based education had a significant impact on improving self-efficacy, with a path coefficient of  $\beta = 0.75$ , indicating a strong and meaningful association between education and self-efficacy. This result is consistent with Bandura's self-efficacy theory, which emphasizes the importance of believing in one's abilities when facing challenges. In this study, feedback-based education, particularly in elderly diabetic patients, had a positive effect on self-efficacy, mirroring findings from other recent studies. This concept is especially relevant for diabetic patients and elderly individuals who may lack the motivation to manage their diseases due to physical and psychological challenges<sup>4</sup>.

In this study, feedback-based education clearly enhanced patients' self-efficacy. This result is consistent with recent studies, which have shown that feedback-based education can significantly improve self-efficacy in diabetic patients<sup>7</sup>. Additionally, Jang and colleagues in a similar study found that continuous, educational feedback given to patients can significantly increase their confidence in managing their diseases. In this research, the use of regular, personalized feedback improved patients' awareness of their health status and encouraged them to engage in regular healthcare practices<sup>8</sup>.

One of the key findings of this study was that increased self-efficacy directly influenced treatment adherence. Here, self-efficacy is recognized as a crucial factor in the acceptance and execution of medical treatments. Numerous studies have shown that self-efficacy is a key factor in the therapeutic success of diabetic patients. Moghimi et al., found that patients with higher self-efficacy are more likely to adhere to treatment regimens and medication plans<sup>9</sup>. They also pointed out that diabetic patients with confidence in their ability to control blood sugar are more likely to stick to their dietary and exercise regimens<sup>10</sup>.

Multiple studies indicate that diabetic patients who feel capable of managing their illness are more likely to consistently take their medications and adhere to other aspects of treatment. Genç & Uslu, concluded that self-efficacy directly positively impacts treatment adherence in diabetes. This is particularly important for the elderly, who may be physically and mentally frail<sup>11</sup>.

In the current study, feedback-based education had an indirect effect on treatment adherence through self-efficacy. That is, patients not only achieved greater self-efficacy through feedback-based education, but this increased self-efficacy also indirectly led to higher treatment adherence. This finding is consistent with various theoretical models. Kim's model, based on self-efficacy and motivation, emphasizes that individuals with high self-efficacy are more resilient in facing challenges, thus more likely to adhere to medical treatments<sup>12</sup>.

These results are also similar to recent studies, which have demonstrated that self-efficacy can act as a mediator in the association between educational interventions and improved treatment outcomes. Selen & Polat, also concluded that feedback-based education can strengthen self-efficacy in patients, leading to increased treatment adherence<sup>13</sup>.

In this study, feedback-based education also had a direct effect on treatment adherence. These findings are supported by similar research showing that even without significant changes in self-efficacy, feedback-based education can still increase treatment adherence. Specifically, Atolagbe et al., demonstrated that continuous feedback and education could directly enhance a patient's motivation to adhere to medical treatments<sup>14-17</sup>.

Even in cases where patients may have low self-efficacy, providing consistent feedback and continuous education improved treatment adherence. This suggests that regular and effective feedback, as a direct intervention, can influence treatment behavior independently of self-efficacy.

## Conclusions

**T**he results of this study suggest that feedback-based education not only directly improves treatment adherence but also enhances it indirectly through increasing self-efficacy in elderly diabetic patients post-surgery. These findings underscore the importance of educational interventions in better managing chronic diseases in elderly populations and suggest that feedback-based educational programs can be an effective strategy to improve health outcomes and treatment adherence in this patient group.

## Limitation

The limitations of this study on feedback-based education for elderly patient's post-surgery are outlined as follows:

**1. Challenges in Long-Term Patient Follow-Up:** Elderly patients may face difficulties attending all follow-up stages due to underlying health conditions, physical limitations, or access constraints. This could limit the availability of data on the long-term effects of feedback-based education.

**2. Dependence on Patient Interaction for Implementation:** The effectiveness of feedback-based education is heavily reliant on the patients' willingness to engage. Some elderly patients might not participate fully due to psychological conditions, such as post-surgical depression, or a lack of motivation, potentially skewing the results.

**3. Influence of External Variables on Treatment Adherence:** External factors like family support, economic status, access to healthcare services, and cultural background can unpredictably impact patients' treatment adherence and self-efficacy. Controlling these factors in real-world settings presents a significant challenge.

These limitations highlight the complexities in assessing the full impact of feedback-based education programs on elderly patients' self-efficacy and treatment adherence.

## References

1. Sinclair AJ, Abdelhafiz AH. Challenges and strategies for diabetes management in community-living older adults. *Diabetes Spectrum*. 2020;33(3):217-227. <https://doi.org/10.2337/ds20-0013>
2. Wang J, Chen K, Li X, Jin X, An P, Fang YI, Mu Y. Postoperative adverse events in patients with diabetes undergoing orthopedic and general surgery. *Medicine*. 2019;98(14):e15089. <https://doi.org/10.1097/MD.000000000015089>
3. Bonikowska I, Szwamel K, Uchmanowicz I. Adherence to medication in older adults with type 2 diabetes living in Lubuskie Voivodeship in Poland: association with frailty syndrome. *Journal of clinical medicine*. 2022;11(6):1707-1718. <https://doi.org/10.3390/jcm11061707>
4. Bandura A. *Self-efficacy: The exercise of control* (WH Free). New York: W H Freeman/Times Books/ Henry Holt & Co;1997.
5. Ataya J, Soqia J, Albani N, Tahhan NK, Alfawal M, Elmolla O, Albaldi A, Alsheikh RA, Kabalan Y. The role of self-efficacy in managing type 2 diabetes and emotional well-being: a cross sectional study. *BMC Public Health*. 2024;24(1):3471-3483. <https://doi.org/10.1186/s12889-024-21050-2>
6. Correia JC, Waqas A, Assal JP, Davies MJ, Somers F, Golay A, Pataky Z. Effectiveness of therapeutic patient education interventions for chronic diseases: a systematic review and meta-analyses of randomized controlled trials. *Frontiers in Medicine*. 2023;9(1):996528-39. <https://doi.org/10.3389/fmed.2022.99652>
7. Hejazi S, Peyman N, Tajfard M, Esmaily H. The impact of education

based on self-efficacy theory on health literacy, self-efficacy and self-care behaviors in patients with type 2 diabetes. *Iranian Journal of Health Education and Health Promotion*. 2018;5(4):296-303. <http://journal.ihepsa.ir/article-1-784-en.html>

8. Ranjbar F, Karimi M, Zare E, Ghahremani L. The effect of educational intervention based on the behavioral reasoning theory on self-management behaviors in type 2 diabetes patients: a randomized controlled trial. *BMC Public Health*. 2024;24(1):1761-1785. <https://doi.org/10.1186/s12889-024-19207-0>
9. Moghimi S, Payandeh A, Seraji M. The Effect of Educational Intervention Based on the Health Behavior Process Approach Model in Medication Adherence of Patients with Type Two Diabetes. *Iranian Journal of Health Education and Health Promotion*. 2024;12(2):142-54. <http://journal.ihepsa.ir/article-1-2705-en.html>
10. Liu H, Yao Z, Shi S, Zheng F, Li X, Zhong Z. The mediating effect of self-efficacy on the relationship between medication literacy and medication adherence among patients with type 2 diabetes. *Patient preference and adherence*. 2023;17(1):1657–1670. <https://doi.org/10.2147/PPA.S413385>
11. Genç FZ, Uslu A. The Relationship Between Medication Self-Efficacy and Self-Management in Individuals with Type 2 Diabetes and the Role of Type D Personality. *Türkiye Diyabet ve Obezite Dergisi*. 2023;7(3):223-30. <https://doi.org/10.25048/tudod.1345587>
12. Bowen PG, Clay OJ, Lee LT, Vice J, Ovalle F, Crowe M. Associations of social support and self-efficacy with quality of life in older adults with diabetes. *Journal of gerontological nursing*. 2015;41(12):21-29. <https://doi.org/10.3928/00989134-20151008-44>
13. Selen F, Polat Ü. The effect of web based type 2 diabetes education on diabetes self management. *Digital Health*. 2023;9(1):20552076231205739. <https://doi.org/10.1177/20552076231205739>
14. Atolagbe ET, Sivanandy P, Ingle PV. Effectiveness of educational intervention in improving medication adherence among patients with diabetes in Klang Valley, Malaysia. *Frontiers in Clinical Diabetes and Healthcare*. 2023;4(1):1132489. <https://doi.org/10.3389/fcdhc.2023.1132489>
15. Salehi K, Kordlu A, Rezapour-Nasrabad R. Prevalence of type 2 diabetes in population over 30 years old (2017-2018). *Ethno Med*. 2020;14(1-2):24-29. <https://doi.org/10.31901/24566772.2020/14.1-2.602>
16. Rezapour-Nasrabad R, Tayyar-Iravanlou F. Hippotherapy and its effect on behavioral and executive disorders in children with autism spectrum disorder. *J Adv Pharm Educ Res*. 2022;12(3):15-20. <https://doi.org/10.51847/LDkLQittmX>
17. Modoodi M, Jalilvand F, Zare S, Ataei M, Saeieh SE, Mirzaei M. Investigating the prevalence of menopausal complications and its related factors in women referred to Shahroud Health Centers in 2014. *Revista Latinoamericana de Hipertension*. 2020;15(2). [http://saber.ucv.ve/ojs/index.php/rev\\_lh/article/view/19423](http://saber.ucv.ve/ojs/index.php/rev_lh/article/view/19423)