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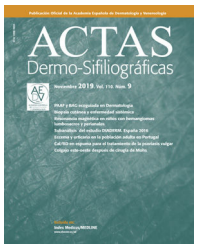

ORIGINAL ARTICLE

The Use of Facial Fillers in Clinical Practice: The Level of Patient Satisfaction and an Overview of Common Clinical Complications

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KEYWORDS
Facial aesthetics;
Dermal filler;
Patient satisfaction;
Complications

Abstract

Background: Patient esthetic satisfaction following facial fillers is an essential topic that should be studied as the number of individuals seeking treatment increases. The face is an essential component of the human body that is frequently associated with beauty, youthfulness, and health. Individuals may seek facial augmentation with fillers for a variety of reasons, such as congenital, acquired by means of aging or disease, or current aesthetic trends.

Objective: The aim is to assess patient's aesthetic satisfaction and description of common clinical complications in relation to the facial filler injections.

Method: A cross sectional survey using a questionnaire derived from the global aesthetic improvement scale and WHO quality of life scale, convenience sampling was used to recruit patients attending cosmetic clinics, descriptive analysis and Chi-square methods were used to analyze the data.

Results: In the study, 500 female participants, with an average age of 28.48 years, were included. Over 90% reported improvement after filler treatment, ranging from improved to very much improved. A statistically significant correlation was observed between patient satisfaction and the number of filler treatments and the anatomical injection site. However, no statistically significant correlation was found when considering age groups. Local side effects, such as swelling and redness at the injection site, were common but generally mild and of short duration.

Conclusion: Although the satisfaction level is currently high, practitioners in the field need to pay more attention to this important outcome, since understanding the patient's motivation and expectation before proceeding with the procedure is very important and can contribute significantly in determining patient satisfaction with the result.

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PALABRAS CLAVE
Estética facial;
Relleno dérmico;
Satisfacción del paciente;
Complicaciones

Uso de rellenos faciales en la práctica clínica: nivel de satisfacción del paciente y visión general de las complicaciones clínicas comunes

Resumen

Introducción: La satisfacción estética del paciente después de los rellenos faciales es un tema esencial que debe estudiarse a medida que aumenta el número de personas que buscan tratamiento. El rostro es un componente esencial del cuerpo humano que se asocia frecuentemente con la belleza, la juventud y la salud. Las personas pueden buscar la mejora facial con rellenos por diversas razones, como congénitas, adquiridas por el envejecimiento o enfermedad, o por tendencias estéticas actuales.

Objetivo: El objetivo es evaluar la satisfacción estética de los pacientes y describir las complicaciones clínicas comunes relacionadas con las inyecciones de rellenos faciales.

Método: Se llevó a cabo un estudio transversal utilizando un cuestionario derivado de la escala global de mejora estética y la escala de calidad de vida de la OMS. Se utilizó un muestreo por conveniencia para reclutar pacientes que asistieron a clínicas de cosmética. Se realizó un análisis descriptivo y se utilizaron métodos de Chi-cuadrado para analizar los datos.

Resultados: En el estudio se incluyeron 500 participantes femeninas, con una edad promedio de 28,48 años. Más del 90% reportó mejoras después del tratamiento con rellenos, que varió desde mejoras hasta mejoras muy significativas. Se observó una correlación estadísticamente significativa entre la satisfacción del paciente y el número de tratamientos con rellenos, y el sitio de inyección anatómico. Sin embargo, no se encontró una correlación estadísticamente significativa al considerar los grupos de edad. Los efectos secundarios locales, como hinchazón y enrojecimiento en el sitio de la inyección, fueron comunes, pero generalmente leves y de corta duración.

Conclusión: Aunque el nivel de satisfacción actual es alto, los profesionales en el campo deben prestar más atención a este resultado importante, ya que comprender la motivación y las expectativas del paciente antes de proceder con el tratamiento es muy relevante, y puede contribuir significativamente a determinar la satisfacción del paciente con el resultado final.

Introduction

Dermal fillers have gained popularity in recent years due to their ability to provide aesthetic benefits similar to surgical procedures, but at a reduced cost and with little to no recovery time. Based on data provided by the American Society for Aesthetic Plastic Surgery (ASAPS), it is evident that in 2011, the United States saw over 1.6 million dermal filler treatments. After neuromodulators, dermal fillers are the second most popular nonsurgical cosmetic procedure, according to this statistic. It is essential to note that these two procedures are frequently performed simultaneously.[1]

The dermal filler market is expanding due to rising public awareness and usage, with over 50 companies worldwide offering approximately 160 products. These procedures primarily target wrinkle and crease reduction and soft tissue restoration caused by disease or aging.[2,3] Cosmetic procedures include various treatments like cheek and jawline augmentation, tear trough correction, nose reshaping, midface volumization, lip enhancement, and facial asymmetry correction. As the popularity and frequency of these procedures rise, an increase in complications is also expected.[4]

Patient opinion is important in assessing efficacy of aesthetic procedures; practitioners' primary objective is patient satisfaction. Cosmetic procedures are sought for different reasons, including enhancing self-esteem and alleviating appearance-related anxiety and depression.[5] Research indicates satisfied individuals exhibit better physiological health and greater engagement in social and economic activities.[6]

Lip enhancement is highly favored among cosmetic procedures due to its popularity. In addition, the safety and efficacy of filler injections are crucial, the size, shape, and proportions of the upper and lower lips significantly impact facial appearance.[7] As people age, their lips and perioral region undergo changes, including the development of lip wrinkles and the flattening of the Cupid's bow, prompting individuals to seek lip enhancement procedures.[5,7]

The delicate nature of the face makes deep knowledge about the anatomy of the area and the injection technique highly required to achieve good results. New filler materials and technologies have simplified the application and have led to longer lasting results, combined with fewer side effects and minimal failure rates.[8]

Various types of fillers have been developed in recent decades to be utilized in the process of facial rejuvenation. These fillers can be classified based on various criteria. The categorization of filler material includes temporary, semipermanent, and permanent effects.[9]

Fillers are classified into biologic and synthetic types based on their chemical composition. Biologic fillers include bovine collagen, animal hyaluronic acid, and autologous fat, while synthetic fillers consist of non-animal hyaluronic acid and calcium hydroxyapatite. Hyaluronic acid is the most

popular filler material in facial enhancement procedures. The ideal filler should be inexpensive, non-resorbable, biocompatible, non-immunogenic, and easily storable. Safety and effectiveness are crucial considerations, and if necessary, the filler should be easily removable.[10,11]

Permanent complications are relatively uncommon with the majority of fillers, despite significant variations in injector expertise and skill. Prior to the injection, a patient's consent is obtained, ensuring that they are informed of all available options and any potential risks.[12]

All fillers are administered through injections, which can lead to potential complications such as needle marks, edema, bruising, discomfort, itching, herpes breakouts, and infection. Additionally, procedural related complications included asymmetry, prominency, overcorrection, undercorrection, allergic reactions, hypersensitivity reactions, and the formation of nodules.[13] Even with proper execution, tissue reactions might occur due to the nature of the filler substance, while other complications may result from inadequate procedural techniques.[14]

The success of a therapy must be determined by how satisfied the patient is with the aesthetic process. Self-image is a key motivator for patients deciding to undergo aesthetic procedures, and outcomes are strongly associated with changes in self-esteem that drive patient satisfaction.[15]

Patients and methods

A cross sectional study was conducted to assess the patient's self-reported experience and improvement in their appearance following filler augmentation. Sample size was estimated through an online sample calculator to be 30 persons, the researcher delivered the translated version of questionnaire form to patients attending from randomly selected aesthetic medicine and dermatology clinics in Kurdistan region of Iraq (see Additional material).

Medically healthy participants capable of understanding and completing the questionnaire were selected through convenience sampling. Before beginning the questionnaire, patients were required to read and sign a consent form. Medically compromised individuals and those who had surgery contraindicating filler augmentation were excluded.

The questions were derived from the Global Aesthetic Improvement Scale and WHO quality of life questionnaire. The questionnaire comprised four parts: Part 1 gathered demographic data like age, education level, and residence ship. Part 2 requested information about the patient's procedure, including the number of administrations, injection site, and filler amount. Part 3 included an improvement scale, patient's feelings towards the results, willingness to repeat the treatment, and recommend it to others. Part 4 focused on side effects experienced and their severity. A certified translator translated both the consent form and the questionnaire into the local language. Clinical appointments were made once or twice per year, and the participants provided feedback on their most recent filler treatments through a questionnaire within a year or less. The study design, along with both versions of the questionnaire, received approval from the ethics committee of the College of Dentistry/University of Sulaimani/Iraq.

Results

The 500 female participants with an average age of 28.5 years (ranging from 23 to 58 years) participated in the study. Depending on the location and vascularity of the injection site, the filler materials were administered with either a needle or an 18-gauge canula. Approximately 33.80% received lip filler injections, while 41% received 1 cc of filler therapy. Following the procedure, a significant proportion of cases experienced mild to moderate symptoms: redness (91%), ecchymosis (85%), numbness (79%), edema (78%), and tenderness (88%). Only 2 cases (0.4%) reported skin necrosis in the glabella and nasal tip. Pain intensity during the therapy session ranged from 1 to 6, with over 76% experiencing this range. Additionally, 49% of the participants were below the age of 30 (Table 1).

The overall satisfaction level with the aesthetic result of the most recent filler treatment showed a predominant trend of ''much improvement,'' with approximately 43.6% of the research sample expressing satisfaction. Participants reported the following perspectives: 29.4% felt ''improved,'' 18.4% felt ''very much improved,'' 7.2% claimed ''no change,'' and 1.4% stated that the treatment had worsened matters. Moreover, 39.8% of patients reported feeling pleased and upbeat most of the time following filler therapy. Additionally, 68.4% expressed their willingness to repeat filler treatment in the future, and 69.6% would recommend filler treatment to their relatives and friends (Table 1).

The satisfaction levels based on the number of filler treatments were examined. Among those who perceived ''very much improvement'' after their most recent filler treatment, 9.2% of them received 1–2 cc of filler material. Furthermore, 15% and 17% of individuals who reported ''much improvement'' following their most recent filler treatment received 1 cc and 1–2 cc filler treatments, respectively. However, the majority of those who reported ''no change'' or ''worsening'' received a 1 cc filler treatment. The Chi-square test with a *P*-value of 0.001 indicated a statistically significant association between the level of satisfaction and the number of filler treatments (Table 2).

The satisfaction levels in relation to the anatomical area of injection. Among individuals who perceived ''much'' and ''very much improvement,'' 14.40% and 6.40%, respectively, received lip filler injections. This may be attributed to higher demand for lip injections, which can lead to subtle enhancements or noticeable changes. In contrast, 2.80%, 1.60%, and 1.20% of those who reported ''no change'' had lip, malar, and nasolabial fold injections, respectively. Approximately 1.40% of patients who received injections in the lip, tear trough, glabella, and nose experienced adverse complications that were more severe than anticipated. The Chi-square test with a *P*-value of 0.001 demonstrated a statistically significant relationship between the level of satisfaction and the anatomical injection site (Table 3).

In regard to the amount of the filler injection in the context of lip procedures. The 33.8% of patients received lip filler injections. Furthermore, 60.9% of patients received 1 cc of filler therapy, whereas 34.9% received 1–2 cc of filler therapy, and the level of satisfaction with the aes-

Table 1 Demographic and clinical characteristics of data:.

Variables	Results groupings	Frequency	Percent
Anatomical area of injection	Lip	169	33.80%
	Malar	96	19.20%
	Nasolabial	72	14.40%
	Tear trough	57	11.40%
	Jawline	42	8.40%
	Glabella	24	4.80%
	Nose	17	3.40%
	Temple	13	2.60%
	Chin	10	2.0%
Amount of filler injection	1 cc	205	41%
	1-2 cc	189	37.8%
	3+ cc	106	21.2%
Clinical complications			
Redness	Non	14	2.8%
	Mild	292	58.4%
	Moderate	163	32.6%
	Severe	31	6.2%
Ecchymosis	Non	33	6.6%
	Mild	226	45.2%
	Moderate	200	40.0%
	Severe	41	8.2%
Numbness	Non	42	8.4%
	Mild	217	43.4%
	Moderate	179	35.8%
	Severe	62	12.4%
Swelling	Non	7	1.4%
	Mild	218	43.6%
	Moderate	172	34.4%
	Severe	101	20.2%
Tenderness	Non	24	4.8%
	Mild	268	53.6%
	Moderate	171	34.2%
	Severe	37	7.4%
Necrosis	Yes	2	0.4%
	No	498	99.6%
Pain level	0	73	14.6%
	1–3	195	39.0%
	4–6	188	37.6%
	7–9	32	6.4%
	10	12	2.4%
Level of satisfaction with the aesthetic result of the last filler treatment	Much improved	218	43.6%
	Improved	147	29.4%
	Very much improved	92	18.4%
	No change	36	7.2%
	Worse	7	1.4%
Feeling cheerful and in good spirit after the filler treatment	Most of the time	199	39.8%
	All of the time	161	32.2%
	More than half of the time	49	9.8%
	Some of the time	46	9.2%
	At no time	25	5%
	Less than half of the time	20	4%
Would you repeat the filler treatment in the future?	Yes	342	68.4%
	No	131	26.2%
	Not sure	27	5.4%
Would you recommend filler treatment for your relatives and friends?	Yes	348	69.6%
	No	124	24.8%
	Not sure	28	5.6%

Table 2 Distribution of level of satisfaction in relation to number of filler treatments.

Number of filler treatments	Satisfaction level					Total	*P*-value
	Very much improved	Much improved	Improved	No change	Worse		
1 cc	15 (3%)	75 (15%)	78 (15.6%)	30 (6%)	7 (1.4%)	205 (41%)	*P* = 0.001
1–2 cc	46 (9.2%)	86 (17.2%)	53 (10.6%)	4 (0.8%)	0 (0.00%)	189 (37.8%)	Significant
3+ cc	31 (6.2%)	57 (11.4%)	16 (3.2%)	2 (0.4%)	0 (0.00%)	106 (21.2%)	
Total	92 (18.4%)	218 (43.6%)	147 (29.4%)	36 (7.2%)	7 (1.4%)	500 (100%)	

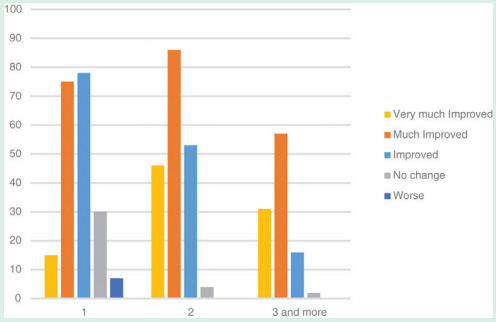
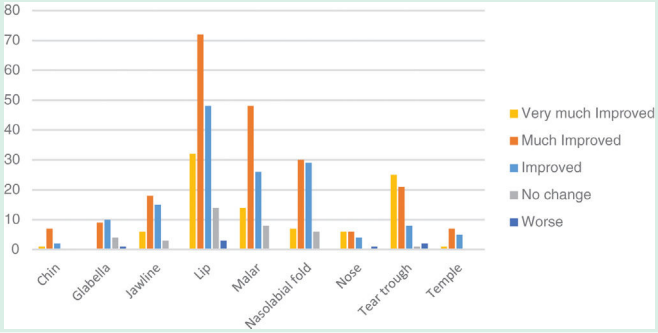


Table 3 Distribution of level of satisfaction in relation to anatomical area of injection.

Anatomical area of injection	Satisfaction level					Total	*P*-value
	Very much improved	Much improved	Improved	No change	Worse		
Lip	32 (6.40%)	72 (14.40%)	48 (9.60%)	14 (2.80%)	3 (0.60%)	169 (33.80%)	*P* = 0.001
Malar	14 (2.80%)	48 (9.60%)	26 (5.20%)	8 (1.60%)	0 (0.00%)	96 (19.20%)	Significant
Nasolabial	7 (1.40%)	30 (6.0%)	29 (5.80%)	6 (1.20%)	0 (0.00%)	72 (14.40%)	
Tear trough	25 (5.0%)	21 (4.20	8 (1.60%)	1 (0.20%)	2 (0.40%)	57 (11.40%)	
Jawline	6 (1.20%)	18 (3.60%)	15 (3.0%)	3 (0.60%)	0 (0.00%)	42 (8.40%)	
Glabella	0 (0.00%)	9 (1.80%)	10 (2.0%)	4 (0.80%)	1 (0.20%)	24 (4.80%)	
Nose	6 (1.20%)	6 (1.20%)	4 (0.80%)	0 (0.00%)	1 (0.20%)	17 (3.40%)	
Temple	1 (0.20%)	7 (1.40%)	5 (1.0%)	0 (0.00%)	0 (0.00%)	13 (2.60%)	
Chin	1 (0.20%)	7 (1.40%)	2 (0.40%)	0 (0.00%)	0 (0.00%)	10 (2.0%)	
Total	92 (18.40%)	218 (43.60%)	147 (29.40%)	36 (7.20%)	7 (1.40%)	500 (100%)	



thetic result of the most recent filler treatment was much improved implying that approximately 42% of the research sample were pleased with the outcome. According to their perspective, 28.4% and 18.9% were at the level of improved and very much improved, respectively, while 8.28% claimed there had been no change and 2.36% stated the treatment had made matters worse. The Chi-square test with a *P*-value of 0.291 demonstrated no statistically significant relationship between the level of satisfaction and the amount of the filler injected (Table 4).

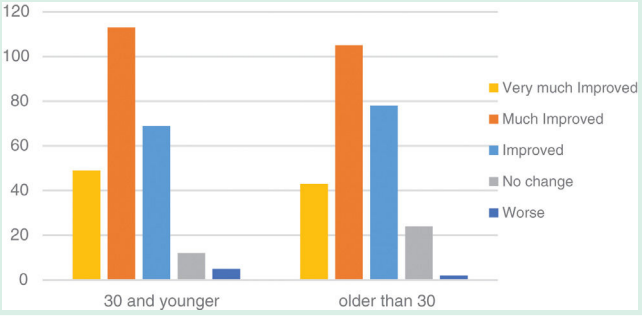
The distribution of the level of satisfaction among different age groups. Data shows that 22.6% and 13.8% of participants who perceived ''much improvement'' and ''improvement,'' respectively, following their most recent filler treatment were below the age of 30. On the other hand, only 2.4% and 1% of individuals who

Table 4 Distribution of level of satisfaction in relation to amount of filler treatments to the lips:.

Amount of filler treatments to the lips	Satisfaction level					Total	*P*-value
	Very much improved	Much improved	Improved	No change	Worse		
1 cc	16 (9.46%)	38 (22.48%)	35 (20.71%)	10 (5.91%)	4 (2.36%)	103 (60.94%)	*P* = 0.291 Not significant
1–2 cc	15 (8.87%)	28 (16.56%)	12 (7.10%)	4 (2.36%)	0 (0.00%)	59 (34.91%)	
2–3 cc	1 (0.59%)	5 (2.95%)	1 (0.59%)	0 (0.00%)	0 (0.00%)	7 (4.14%)	
Total	32 (18.93%)	71 (42.01%)	48 (28.40%)	14 (8.28%)	4 (2.36%)	169 (100%)	

Table 5 Distribution of level of satisfaction in relation to age group:.

Variables	Level of satisfaction with the aesthetic result of the last filler treatment					Total	*P*-value
	Very much improved	Much improved	Improved	No change	Worse		
≤30	49 (9.8%)	113 (22.6%)	69 (13.8%)	12 (2.4%)	5 (1%)	248 (49.6%)	*P* = 0.165 Not significant
31+	43 (8.6%)	105 (21.8%)	78 (15.6%)	24 (4.8%)	2 (0.4%)	252 (50.4%)	
Total	92 (18.4%)	218 (43.6%)	147 (29.4%)	36 (7.2%)	7 (1.4%)	500 (100%)	



reported ''no change'' or ''worsening'' were in the same age group. In contrast, the majority of participants over the age of 30 reported being ''much improved'' (21.8%) or ''improved'' (15.6%), while only 4.8% and 0.4% reported ''no change'' or ''worse results,'' respectively. According to the Chi-square test, there was no statistically significant association between the level of satisfaction and age group, with a *P*-value of (*P* = 0.165) (Table 5).

Discussion

According to studies, patients undergo cosmetic procedures for many reasons; to look more beautiful, attractive and enhance their physical and mental wellbeing. Hence, patient's satisfaction after cosmetic procedure is considered one of the top outcomes that practitioners must look to achieve. In the last few years many researchers have explored patient's levels of satisfaction after different types of cosmetic procedures, using different self-reporting tools to assess it, and some of the studies have compared different types of filler or different techniques in terms of patient satisfaction as an outcome.[16,17]

The main contribution of this study is the evaluation of facial enhancement procedures in a younger age group, compared to most of the other studies that reported on participants in the older age ranges.[7,18,19] The importance of this difference in age group comes from two facts: first, the enhancement goals and the motivations differ in younger patients, and this will totally affect their evaluation of the result of the procedure; secondly, the quality of the skin and the supporting tissue of the face and the severity of deficit vary greatly with age, which will also affect the outcome of the procedure. Therefore, evaluating patient satisfaction in younger age groups is very important as it can greatly help practitioners to gain better insights about patients .[19]

The side effects that patients suffer and that can affect their whole experience with the procedure, in our study the most common side effects were redness, ecchymosis, numbness, swelling, and tenderness respectively. All these side effects were local and the majority were mild to moderate in degree, these findings are consistent with Stojanovič and Majdič who reported in their literature review that the swelling and redness were the most common complications, and the majority of them were mild in severity.[20] Skin Necro-

sis is one of the most severe complications that can arise from cosmetic procedures. It can be caused by the interruption of blood flow to the area, compression near a blood vessel, occlusion of a blood vessel by a foreign object, or direct tissue damage.[4] In this study, only two patients encountered skin necrosis in the glabellar region and nasal tip after injection of 1 cc of Hyaluronic acid filler for the treatment of glabellar crease and nasal tip definition. Within the first twenty-four hours, the conditions were treated with injections of hyaluronidase material, extensive massaging of the affected area, administration of antibiotics and Aspirin, and close observation and follow-up.

The main aim of this study was to assess the satisfaction level, and the results were highly encouraging. The patients' satisfaction level was assessed by using four key questions to achieve an accurate insight: how much the patient felt improved after the procedure, how long they felt psychologically well after the procedure, whether they repeat the procedure and recommend it to others. These results indicated that most of the procedures were successful and achieved good results.

Despite using different scales to assess satisfaction and studying different age groups, our findings on enhancement procedures align with the majority of existing literature in this field. For instance, a recent study by Bertucci and Nikolis reported that over 89% of patients experienced high satisfaction levels after undergoing facial enhancement procedures.[18] Similarly, Eccleston and Murphy measured satisfaction levels at two time points, one month and twelve months after the procedure, and reported high satisfaction rates of 96.9% and 80%, respectively.[21] Another study, which assessed satisfaction at an intermediate point of six months, reported a 79.7% satisfaction level.[3] Almost all studies showed high satisfaction levels and within limits of our research, and no study indicated that facial enhancement treatments result in significant dissatisfaction.

Hoffman and Fabi, in their literature review about patient's satisfaction level, reported that the highest level of satisfaction was in patients who underwent two treatment sessions, an initial and re-treatment session, we found that the highest percentages of improvement, much and very much improvement were among those who had more than 1 cc filler treatments regardless of the treatment visits, and the association was highly significant statistically.[22]

Although in most of the other studies the volume of filler used was higher on average, one study reported 1.67 ml,[18] others used 2 ml on average,[19,23] we found that the satisfaction level becomes higher in patients on whom more than 1 ml of filler was used. The amount of filler needed will differ according to the amount of volume loss and tissue deficit, and these are more severe in the older age group.

Regarding the injection sites, the highest percentage of satisfaction were among those who received filler injections in their lips. This can be attributed to the fact that lip enhancement results in a more uniform shape of the lower part of the face, leading to a new, beautiful appearance. While the number of patients who felt looked worse after the procedure was very low, accounting only 1.4% of all participants.

Future researches should employ varied satisfaction scales and the time frame better to be considered due to temporary effect of fillers. Assessing patient satisfaction at different time points (1, 3, 6, and 12 months) will elucidate procedure duration.

Conclusion

In the medical context, patient satisfaction with the outcome of the procedure is regarded as one of the most important determinants of success. Prior to the procedure, practitioners should inform patients about the expected outcomes, which will play a significant role in determining their satisfaction. However, unlike previous studies, this study considers younger patient groups to be a significant factor; additional research on patient satisfaction is required to comprehend patient requirements and improve overall outcomes.

Conflict of interests

The authors declare that they have no conflict of interest.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.ad.2023.10.008.

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