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Quality of Life and Treatment Satisfaction In Type I Diabetic Patients Treated with Subcutaneous Insulin Multiple Daily Injections

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الملخص:

الخلفية: يمثل مرض السكري مشكلة صحية كبيرة بسبب ارتفاع معدل انتشاره ومضاعفاته ووفياته، وتأثيره على أسلوب حياة المريض، وبالإضافة الي تأثيره على النظام الصحي. وكذلك يتضمن التأثير البدني والعاطفي لمرضى السكري، وهو مرض يتطلب علاجًا مدى الحياة، بما في ذلك نمط الحياة والتدابير الدوائية، غالبًا باستخدام أدوية متعددة خلال اليوم. جودة الحياةQOL تعتبر مقياسًا شخصيًا للصحة والرفاهية المرتبطة بمرض ما. الرضا عن العلاج هو مقياس شخصي يقيم تجربة المريض في عمليات ونتائج العلاج. علاوة على ذلك، من المعروف أن ضعف الرضا عن العلاج يضر بالالتزام بالعلاج. **هدف البحث:** كان الهدف من دراسة الحالات والشواهد هو تحديد واستكشاف نوعية الحياة QOL ومدي الرضا عن العلاج لدى مرضى السكري من النوع الأول (T1DM) المعالجين بحقن الأنسولين اليومية المتعددة تحت الجلد(MDI) . **طرق البحث:** يشمل البحث المرضى الذين تتراوح أعمارهم بين 18 و 55 عامًا، والذين يحضرون إلى عيادات مرضي السكري في زيارات روتينية، بحيث يكملوا استبيانًا تم التحقق منه مسبقًا بأخذ عينة عشوائية وتم تصميم الاستبيان عن طريق استخدام ثلاث استبانات مصرحة وموثوقة عالميا وتشمل مقياس جودة الحياة الخاص بمرض السكري(DSQOLS) ، واستبيان الرضا عن علاج مرض السكري (DTSQ) والمسح الص(SF-36) SF-36. **النتائج:** أظهرت نتيجة هذه الدراسة عدم وجود فروق في التوزيع بين الجنسين 53.3٪ ذكور و46.7 اناث. علاوة على ذلك، كانت النسبة الأكبر من العمر بين 46-55 (50٪)، وكانت نسبة رضا المرضى أعلى بين الذكور 81.3٪ والخريجين 40٪ وبين الاعمار 26-35 (80.0٪). الخلاصة: في الختام، يعد مرض السكري من النوع الأول حالة شائعة ويعتبر مصدر قلق مهم للصحة العامة، مما يزيد بشكل كبير من مخاطر المشاكل الصحية. تعتبر جودة الحياة المتعلقة بالصحة (HRQOL) مفهومًا متعدد الأبعاد يتضمن المجالات المتعلقة بتأثير كل من إدراك الصحة البدنية والعقلية وما يرتبط بهما مثل المخاطر والظروف الصحية.

الكلمات المفتاحية: داء السكري من النوع الأول، العلاج بالأنسولين، الحقن اليومية المتعددة، جودة الحياة المرتبطة بالصحة.

Abstract

Background: Diabetes represents a major health problem because of its high prevalence, morbidity and mortality, its influence on patient quality of life and its impact on the health system. This impact involves the physical and emotional overload of diabetes, a disease that requires life-long treatment, including lifestyle and pharmacological measures, often with multiple drugs. Quality of life QOL is regarded as a subjective measure of health and well-being related to a disease. Treatment satisfaction is a subjective measure that evaluates the patient's experience of the processes and results of treatment. Furthermore, it is understood that poor satisfaction with treatment compromises treatment adherence. **Aim:** The aim of this case-control study was to determine and explore the quality of life QOL and treatment satisfaction in patients with Type 1 diabetes (T1DM) treated with subcutaneous insulin multiple daily injections (MDI). **Subjects and Method:** Consecutive patients aged between 18 and 55 years, and attending diabetes clinics for a routine visit, completed a pre-validated questionnaire created from the Diabetes-Specific Quality-of-Life Scale (DSQOLS), the Diabetes Treatment Satisfaction Questionnaire (DTSQ) and the SF-36 Health Survey (SF-36). **Results:** The result of this study shows that there is no difference in distribution between genders; 53.3% males and 46.7 females. Moreover, the largest percentage of age was between 46-55 (50%). Patient satisfaction presented at a higher percentage in males 81.3%, graduates 40% and patients aged 26-35 (80.0%). **Conclusion:** To conclude, diabetes Type 1 is a common condition and is considered a significant public health concern that significantly increases the risk of health problems. Health-related quality of life (HRQOL) is considered a multi-dimensional concept that includes domains related to the effect of both physical and mental health perception and their correlates such as the health risks and conditions.

Keywords: Diabetes mellitus Type 1, insulin therapy, Health-Related Quality of Life, elderly.

1. INTRODUCTION

Type 1 diabetes mellitus (DM) is an autoimmune disease that includes characteristics that lead to complete insulin deficiency due to the immunological destruction of beta cells [1]. People with Type 1 DM require insulin and must use it throughout their lives.

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The condition impacts their lifestyle and daily living in many ways. For example, special activities such as diet control and exercise are required to maintain a healthy lifestyle and prevent complications from the disease [2]. Reports indicated that the incidence of childhood-onset Type 1 DM has been reported worldwide [3]. Therefore, Type 1 diabetes causes people to make changes to their lifestyle that could affect their entire family. It also affects their daily emotions and quality of life (QOL), including their food choices, blood sugar measurements, and injections [4].

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Although Type 1 DM is currently an incurable disease, it is necessary to consider the QOL of diabetic people as they are required to live with and manage the disease for a lifetime [5]. People with Type 1 DM experience long-term stress, which was associated with multicomponent management and concerns about complications [6], as acute and chronic complications can be considered factors that influence QOL. Additionally, besides disease-related factors such as the level of disease management, various psychosocial factors resulting from managing the disease over an extended period can also influence QOL. It was also reported that psychosocial responses to Type 1 DM, such as depression, anger, and stress, have the same effect on QOL as other factors, which include self-efficacy for self-management, coping, and family support [7]. In recent years, QOL consisting of physical, psychological and social aspects has become more important in health care. Different instruments were developed to measure QOL in various patient categories; generic instruments to allow comparisons with other patient populations or samples of the general population and disease-specific instruments to assess the influence of different aspects of a specific disease and its treatment [8–9]. Treatment satisfaction is a subjective measure that evaluates the patient's experience of the processes and results of treatment. Furthermore, it is known that poor satisfaction with treatment compromises treatment adherence [10], which may have adverse consequences on the metabolic control of the disease and the risk of late complications and mortality [11-12]. Paying attention to the QOL of patients with DMT1 is crucial [13, 14–15]. Patients with DMT1 had a lifelong, chronic and serious disease that would develop several micro- and macro-vascular complications, which would have a daily impact on their physical and psychological functioning. In addition to the fact that DMT1 was a serious chronic disease, it was a frequently occurring disease [16].

AIM: The goal of this case-control study was to explore the quality of life (QOL) and treatment satisfaction in patients with Type 1 diabetes (T1DM) who were treated with subcutaneous insulin multiple daily injections (MDI).

2. SUBJECT AND METHOD:

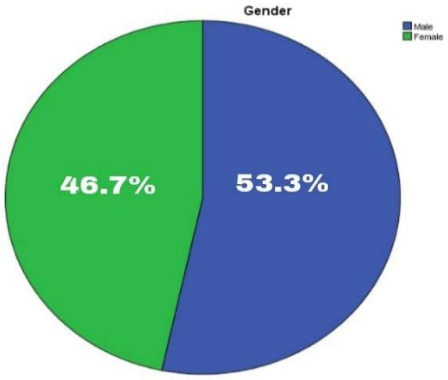
Description of the Research Setting: A case-control observational study was conducted in three hospitals for diabetics located in Benghazi from December to July 2020/2021. Hospitals were given cover letters explaining the purpose of the study, and assuring the confidentiality of information and approval was requested. Once the study was approved, the patients were asked for verbal consent to participate in the study. Quality of life and treatment satisfaction with Type 1 diabetes.

Subject and sampling: The target sample of the study was 250 patients but due to the COVID-19 pandemic, the study was forced to settle for only 110 patients. The sample was collected over a period of seven months, mainly from patients who visited one of the diabetic hospitals to follow up on their diseases.

Study Design: A quantitative type of research was conducted, adopting the structured interview survey methodology. 110 questionnaires were filled out using a face-to-face interview technique and the information was obtained from patients only, not their families/companions.

Inclusion and exclusion criteria

Exclusion criteria: the excluded participants from this study were



diabetic patients who take continuous subcutaneous insulin infusion or are dependent on lifestyle changes only, as well as people under 18 years old, and people from other nationalities.

Inclusion criteria: The patients who were allowed to participate in this study were: Libyan, with Type 1 diabetes, aged 18 years and over, and taking subcutaneous insulin multiple daily injections.

The Research instrument: The main idea for the current study centered on the quality of life and satisfaction of patients with their treatment. Therefore, the questionnaire was created based on these characteristics by using three validated questionnaires. After review, a set of questions was selected that are useful in achieving the goal of the research and can be applied in the study community. The three questionnaires involved are the SF-36 Questionnaire, the Diabetes-specific Quality-of-life Scale Questionnaire (DSQOLS) and the Diabetes Treatment Satisfaction Questionnaire (DTSQ).

The SF-36 Questionnaire is a set of generic, coherent, and easily administered quality-of-life measures. These measures rely upon patient self-reporting and are now widely utilized by managed care organizations and by Medicare for Routine monitoring and assessment of care outcomes in adult patients. The Diabetes-specific Quality-of-life Scale Questionnaire (DSQOLS) accurately addresses the differences between various forms of therapy in diabetes mellitus (DM) 1 and investigates the level of patient satisfaction with their current treatment in relation to their individual goals. The Diabetes Treatment Satisfaction Questionnaire (DTSQ) was first developed in the early 1980s. It is now widely used, particularly in clinical trials, and also for routine clinical monitoring.

The questionnaire was piloted on a convenience sample of 5% (n= 10) of the target sample, and after piloting further necessary modifications to the questionnaire were made to make it more suitable and understandable for the current community sample. Finally, a customized questionnaire was developed containing 14 questions taken from the previously mentioned questionnaires. Also, some questions were added for more comprehensivity after different literature reviews were conducted. The resulting data from the pilot test was excluded from the final analysis, and then

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the final questionnaire was adopted to collect the research sample.

Ethical consideration: The researchers acquired a written agreement to collect data from the three hospitals.

Statistical Analysis: Responses to each question were coded and analyzed using the Statistical Package for Social Sciences (SPSS) version 21 for Windows (SPSS Inc., Chicago, Illinois), and cross-tabulations were used due to the types of data to test any significance between categorical variables. All P-values were two-sided and the P value was 0.05 except for two questions which were; 0.05 which is not considered statistically significant.

3. RESULTS:

During the study period, a total of 110 diabetics patients were reached, 11 of whom were excluded because they refused to participate due to the lack of time or a lack of trust in divulging their information, and 9 of them were rejected due to missing data, so the number of participants included in the study was 90 with a response rate of 81.8%.

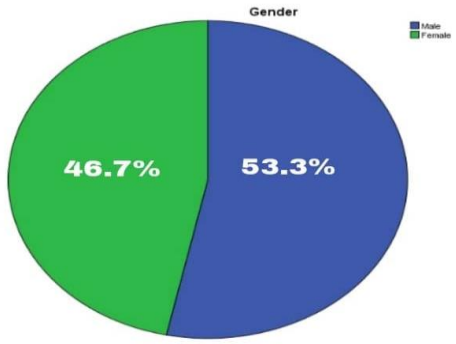


Figure1. Gender distribution

This figure showed little difference between males (53.3%) and females (46.7%)

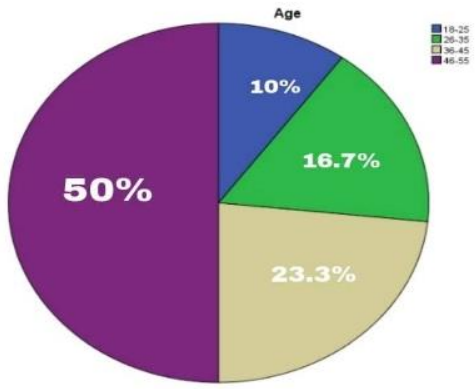


Figure2. The age group of participants

This figure showed that the majority of participants were at age 46-55 with 50%

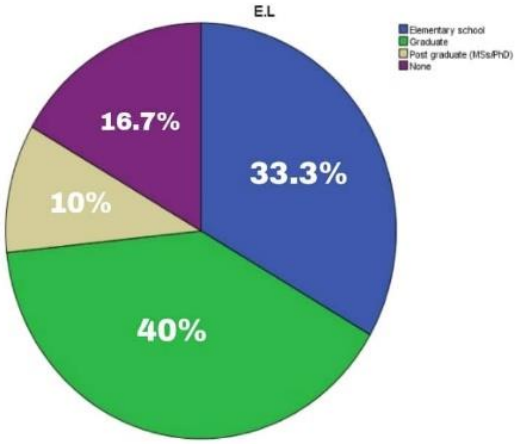


Figure3. The educational level of participants

This figure showed that the majority of participants were graduates (40%)

Table 1. The cross-tabulation between gender and the question How satisfied are you with your current treatment?

How satisfied are you with your current treatment?				within Gender
Rarely	Sometimes	Often	Always	
0.0%	*6.3%*	*12.5%*	*81.3%*	Male
21.4%	*7.1%*	*21.4%*	*50.0%*	Female

Table 2. The cross-tabulation between age and the question How satisfied are you with your current treatment?

How satisfied are you with your current treatment?				Within age
Rarely	Sometimes	Often	Always	
0.0%	*0.0%*	*33.3%*	*66.7%*	18-25
20.0%	*0.0%*	*0.0%*	*80.0%*	26-35
0.0%	*0.0%*	*14.3%*	*85.7%*	36-45
13.3%	*13.3%*	*20.0%*	*53.3%*	46-55

Table 3. The cross-tabulation between age and the question During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, neighbors or groups?

During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, neighbors or groups?					Within age
Never	Rarely	Sometimes	Often	Always	
0.0%	*33.3%*	*33.3%*	*0.0%*	*33.3%*	18-25
0.0%	*20.0%*	*20.0%*	*60.0%*	*0.0%*	26-35
14.3%	*28.6%*	*14.3%*	*42.9%*	*0.0%*	36-45
26.7%	*33.3%*	*26.7%*	*13.3%*	*0.0%*	46-55

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4. DISCUSSION:

In the current study, the sample collected from 3 diabetes clinics registered 90 diabetic patients with an age group between 18 to 55 who used multiple daily injections MDI without any experience in coetaneous subcutaneous insulin infusion CSII. This study represents the first study that measures the health-related quality of life in an adult population in Benghazi. This study showed that there is no significant difference between males to females ratio, with the sample population 53.3% males and 46.7 females which may be due to the disease distribution in both sexes, so the gender factor has no role based on the research finding. Likewise, another study had the same results with a close percentage reported in Italy with 54.3% males and 45.7% females [15]. Whereas in South Korea, the majority was female 64%, while males were at 36% [16]. This may be due to the difference in socioeconomic characteristics and the spread of the disease between different genders. Moreover, regarding the age group, the largest percentage was aged between 46-55 (50%), with the other age groups distributed as 36-45 (23.3%), 26-35 (16.7%) and 18-25 only (10%). Which may refer to adulthood contributing clearly in this disease. As for the educational level of the patients, the largest percentage ranged between graduates and elementary school, where the percentages were distributed as follows: the graduates were 40%, elementary school 33.3%, whereas the illiterate presented at a percentage of 16.7%, which considered that great value in the presence of education levels between participants, due to this disease's influence on the quality of life whatever the type and degree of education between participants. According to the answers to the question about the effect over the past four weeks that their physical health or emotional problems over their normal social activity with family, neighbors or groups, 3.3% said always, 26.7% said very often, 23.3% said sometimes, 30% said rarely and 16.7% said never. After cross-tabulation of age and gender with these questions of patients' satisfaction, the higher percentage was male, graduate and aged 26-35. This may be due to the educational level at the adult stage having a direct effect on the quality of life, whereas the answer of patients regarding their nutrition and psychological state was close, which may refer to different unstable community situations and the impact of the coronavirus at that time. Women were found to be more negative about the disease compared to men, as presented in another study that validated the Italian version of the WHO's Well-Being Questionnaire (WBQ) which showed that lower levels of treatment satisfaction were related to the female gender [17]. This was also reported in other studies, as the etiology is unclear [18, 19–20]. Gender differences during puberty might play a role since female patients usually require more insulin in this period due to hormonal changes [21–22]. Female patients with Type 1 diabetes tend to worry more and were generally less satisfied than males [23–24]. Recent studies showed that depression has a higher prevalence in adolescent girls than boys in the Saudi population, which can be a confounding factor [25]. Additionally, the reason may be due to the impact of awareness, and this connection needs more information and focus on this group to reveal the reasons behind it.

5. CONCLUSION:

In conclusion, the outcome of our study suggests that the male participants experienced a better health-related quality of life in almost all aspects. However, we cannot overlook the fact that our study had a small sample size with different ages which makes it difficult to make precise comparisons. Moreover, this may have affected our results as male patients report better QOL[26-27]. To the best of our knowledge, current literature contains no published study that took place in all regions of Libya comparing the health-related quality of life between the MDI and insulin pump groups with different genders. Therefore, we strongly suggest that future research further explore what has been established by this study. We also recommend the enrollment of several centers in Libya to approach more solid evidence regarding the influence of multiple daily insulin on improving the QOL in Type 1 diabetic patients. Finally, diabetes Type 1 is a common condition and it is considered a significant public health concern that significantly increases the risk of health problems. Health-related quality of life (HRQOL) is a multi-dimensional concept that includes domains related to the effect of both physical and mental health perception and their correlates such as the health risks and conditions.

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6. REFERENCES:

1. Atkinson M.A., Eisenbarth G.S., Michels A.W. Type 1 Diabetes. Lancet. 2014;383:69–82. doi: 10.1016/S0140-6736(13)60591-7.
2. American Diabetes Association Classification and diagnosis of diabetes: Standards of medical care in diabetes-2018. Diabetes Care. 2018;41:S13–S27. doi: 10.2337/dc18-S002.
3. Chae H.W., Seo G.H., Song K., Choi H.S., Suh J., Kwon A., Ha S., Kim H.-S. Incidence and prevalence of type 1 diabetes mellitus among Korean children and adolescents between 2007 and 2017: An epidemiologic study based on a national database. Diabetes Metab. J. 2020;44:866–874. doi: 10.4093/dmj.2020.0212.
4. Keklik D., Bayat M., Başdaş Ö. Care burden and quality of life in mothers of children with type 1 diabetes mellitus. Int. J. Diabetes Dev. Ctries. 2020;40:431–435. doi: 10.1007/s13410-020-00799-3.
5. Jing X., Chen J., Dong Y., Han D., Zhao H., Wang X., Gao F., Li C., Cui Z., Liu Y., et al. Related factors of quality of life of type 2 diabetes patients: A systematic review and meta-analysis. Health Qual. Life Outcomes. 2018;16:189. doi: 10.1186/s12955-018-1021-9.
6. Kakleas K., Kandyla B., Karayianni C., Karavanaki K. Psychosocial problems in adolescents with type 1 diabetes mellitus. Diabetes Metab. 2009;35:339–350. doi: 10.1016/j.diabet.2009.05.002.
7. Whittemore R., Jaser S., Guo J., Grey M. A conceptual model of childhood adaptation to type 1 diabetes. Nurs. Outlook. 2010;58:242–251. doi: 10.1016/j.outlook.2010.05.001.
8. Coons SJ, Rao S, Keininger DL, Hays RD. A Comparative Review of Quality-of-Life Instruments. Pharmacoeconomics 2000; 17: 13–35.6.
9. Testa MA, Simonson DC. Assessment of quality-of-life outcomes. N Engl J Med 1996; 334: 835–840

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10. United Kingdom Prospective Diabetes Study Group: Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment on risk of complications in patients with type 2 diabetes (UKPDS 33). Lancet 352: 837–853, 1998.

11. Centers for Disease Control and Prevention (CDC). Self-rated fair or poor health among adults with diabetes—United States, 1996–2005. MMWR Morb Mortal Wkly Rep 2006; 55: 1224–1227

12. Colquitt JL, Green C, Sidhu MK, Hartwell D, Waugh N. Clinical and cost-effectiveness of continuous subcutaneous insulin infusion for diabetes. Health Technol Assess 2004; 8: 1–171.

13. CCT: Influence of intensive diabetes treatment on quality-of-life outcomes in the diabetes control and complications trial. Diabet Care 1996; 19: 195–203.

14. Eiser C, Tooke JE. Quality-of-life evaluation in diabetes.Pharmacoeconomics 1993; 4: 85–91.

15. Bradley C. Measuring quality of life in diabetes. DiabetAnn 1996; 10: 207–224.11

16. H.E. Hart1, H.J.G. Bilo2, W.K. Redekop1, R.P. Stolk3, J.H. Assink4 & B. Meyboom-de Jong5 Quality of life of patients with type I diabetes mellitus. Available from: *https://www.researchgate.net/publication/8980758_Quality_of_life_of_patients_with_type_I_diabetes_mellitus* Quality of Life Research 12: 1089–1097, 2003.Ó[accessed Jul 28 2022].

17. Nicolucci A, Giorgino R, Cucinotta D, Zoppini G, Muggeo M, Squatrito S, Corsi A, Lostia S, Pappalardo L, Benaduce E, Girelli A, Galeone F, Maldonato A, Perriello G, Pata P, Marra G, Coronel GA. Validation of the Italian version of the WHO-Well-Being Questionnaire (WHO-WBQ) and the WHO-Diabetes Treatment Satisfaction Questionnaire (WHO-DTSQ). Diabetes Nutr Metab. 2004 Aug;17(4):235-43. PMID: 15575345.

18. Cameron FJ. The impact of diabetes on health-related quality of life in children and adolescents. Pediatr Diabetes. 2003;4:132-136.

19. Williams C. Doing health, doing gender: teenagers, diabetes and asthma. Soc Sci Med. 2000;50:387-396.

20. Naughton MJ, Ruggiero AM, Lawrence JM, et al. Health-related quality of life of children and adolescents with type 1 or type 2 diabetes mellitus: SEARCH for diabetes in youth study. Arch Pediatr Adolesc Med. 2008;162:649-657.

21. Amiel SA, Sherwin RS, Simonson DC, Lauritano AA, Tamborlane WV. Impaired insulin action in puberty. N Engl J Med. 1986;315:215-219.

22. Mortensen HB. Findings from the Hvidøre Study Group on Childhood Diabetes: metabolic control and quality of life1. Horm Res Paediatr. 2002;57:117-120.

23. Hoey H, Aanstoot H-J, Chiarelli F, et al. Good metabolic control is associated with better quality of life in 2,101 adolescents with type 1 diabetes. Diabetes Care. 2001;24:1923-1928

24. Ingersoll GM, Marrero DG. A modified quality-of-life measure for youths: psychometric properties. Diabetes Educ. 1991;17:114-118.

25. AlBuhairan FS, Tamim H, Al Dubayee M, et al. Time for an adolescent health surveillance system in Saudi Arabia: findings from "Jeeluna." J Adolesc Heal. 2015;57:263-269.

26. AbdulRasoul M, Mousa M, Al-Mahdi M, Al-Sanaa H, Al-AbdulRazzaq D, Al-Kandari H. A Comparison of continuous subcutaneous insulin infusion vs. multiple daily insulin injections in children with type I diabetes in Kuwait: glycemic control, insulin requirement, and BMI. Oman Med J. 2015;30:336-343.

27. Cho MK, Kim MY. What Affects Quality of Life for People with Type 1 Diabetes?: A Cross-Sectional Observational Study. Int J Environ Res Public Health. 2021 Jul 17;18(14):7623. doi: 10.3390/ijerph18147623. PMID: 34300074; PMCID: PMC8304448

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