

## **STUDY ON KNOWLEDGE AND ATTITUDES TOWARD ORAL HEALTH AND HEALTH-RELATED BEHAVIORS AMONG YOUNG ADULTS**

**Adina Oana Armencia, Irina Bamboi, Bianca Toader, Andrei Nicolau, Ana Nemțoi, Anca Rapis, Carina Balcos**

“Gr. T. Popa” U.M.Ph. - Iași, Romania, Faculty of Dentistry, Department I Surgery

Corresponding author; e-mail: [nicolau.andrei@umfiasi.ro](mailto:nicolau.andrei@umfiasi.ro)

### **Abstract**

Oral health is an important factor for overall well-being, and understanding the knowledge, attitudes, and behaviors related to it can influence the prevention of dental diseases. This study analyzes these aspects in a group of young adults from Romania. Material and Methods: The study group included 100 participants, selected based on age, gender, background, and education level. Two questionnaires were used to assess the knowledge, attitudes, and behaviors towards oral health: the Hiroshima University–Dental Behavioral Inventory (HU-DBI) and an online KAB questionnaire. Results: The majority of participants had a moderate level of knowledge about oral health, with significant variations based on education and background. Preventive behaviors were more frequent among those with a higher education level. Conclusions: Education plays an essential role in forming health-promoting behaviors and preventing dental diseases. A more comprehensive educational program is needed for young adults.

**Keywords:** oral health, knowledge, attitudes, behaviors, prevention.

Oral health can be defined as a multidimensional concept, encompassing physical, psychological, emotional, and social aspects that are integral to overall health and well-being (1). Although largely preventable, oral diseases have a significant negative impact on individuals, communities, and society as a whole. They represent a global public health issue, with particular concern about their increasing prevalence in many low- and middle-income countries, linked to broader social, economic, and commercial changes. Oral diseases are chronic and progressive. For instance, dental caries affects very young children but persists throughout life, from adolescence to adulthood and into old age (1).

Oral diseases disproportionately affect disadvantaged members of society. There is a strong and consistent social gradient between socio-economic status and the prevalence and severity of oral diseases. As such, oral diseases can be considered a sensitive clinical marker of social disadvantage, an early indicator of poor population health related to deprivation. Oral diseases and inequalities in oral health are directly influenced by social determinants that underlie poor oral health in the population (1).

Oral health is a key component of overall health. Oral diseases have been shown to be closely linked to other systemic diseases, such as diabetes, digestive disorders, stroke, cardiovascular diseases, metabolic syndrome, adverse pregnancy outcomes, and obesity. Given the importance of oral health for the entire body and the high prevalence of oral diseases, the joint effort of dentists and general practitioners is essential for individual health. Knowledge, behavior, and oral health status are influenced by numerous factors, such as culture, environment, and social habits (2).

The aim of this study is to assess the knowledge, attitudes, and health-related behaviors regarding oral health among young adults in Iași.

### **MATERIALS AND METHODS**

The study was conducted on a group of 100 subjects, selected during 2023 and 2024, with the aim of evaluating knowledge, attitudes, and behaviors related to oral health. The study group consisted of young adult participants, aged between 18 and 40, coming from diverse socio-cultural backgrounds. Participants were divided into subgroups based on demographic characteristics, such as age, sex, place of residence (urban/rural), and

the highest level of education completed (high school or higher education).

The inclusion criteria for selecting participants were age, absence of general pathology, willingness to participate in the study, and complete questionnaire responses. The exclusion criteria included participants with severe conditions that could influence their oral health behaviors or those who refused to answer all questions in the questionnaires.

To assess knowledge related to oral health, the Hiroshima University–Dental Behavioral Inventory (HU-DBI) questionnaire was used. This internationally recognized and validated tool, developed by Dr. Kawamura Makota, includes 27 statements, each with two response options: “agree” or “disagree.” The total score obtained from the participant’s answers reflects their level of knowledge, attitudes, and behaviors regarding oral health. Each affirmative or negative response is scored with 1 point, and the ratio between affirmative and negative answers provides an index that estimates concern and behaviors related to oral health. The total score can range from 2 to 12 points, with higher values suggesting greater concern for oral health and more health-promoting behaviors (3, 4, 5, 6).

For further evaluation of knowledge, attitudes, and behaviors, an online KAB questionnaire for young adults was used. This

questionnaire was structured into four main areas (7):

Profile of the Questionnaire Sections are:

- Demographic Profile – 5 questions designed to identify the socio-demographic characteristics of the participants (age, sex, place of residence, and the highest level of education completed).
- Knowledge Profile – 14 questions that assessed the participants’ knowledge about the etiology, risk factors, symptoms, and complications related to oral health issues.
- Attitude Profile – 8 questions based on the Health Belief Model, designed to assess the participants’ perceptions and attitudes towards the prevention of dental diseases.
- Behavior Profile – 7 questions that assessed the participants’ behaviors regarding oral hygiene, use of dental hygiene products, and other preventive or treatment actions.

The questions in the questionnaire were structured to allow the assessment of correct, incorrect, or insufficient knowledge, while attitudes and behaviors were measured on a Likert scale or frequency scale. The scores for correct and incorrect knowledge are presented in Table I.

**Table I. KAB Questionnaire for Oral Health (7)**

Domain	Total Items	Method	Response Options
Socio-demographic factors	5	Age, sex, place of residence, highest level of education completed	One response option
Knowledge	14	Etiology, clinical manifestations, treatment, symptoms, preventive measures for oral health	Yes/No/Don’t know 0=incorrect/ don’t know, 1=correct response
Attitudes	8	Individual attitudes based on the Health Belief Model	1=strongly agree, 2=agree, 3=neutral, 4=disagree, 5=strongly disagree
Behavior	7	Various oral hygiene actions that could have a positive or negative impact on oral health	1=never, 2=rarely, 3=occasionally, 4=very often, 5=always

**RESULTS AND DISCUSSION**

The sample consisted of 56 females and 44 males, with participants coming from both urban (72 subjects) and rural (28 subjects) areas (Table II). The majority of participants were aged between 18 and 30 years (49%), followed by those over 30 years old (42%),

and those under 18 years old (9%). Additionally, participants were assessed based on the highest level of education completed, with 4% having completed vocational school, 6% completed middle school, 14% post-high school education, 34% high school, and 42% university education.

**Table II. Distribution of Participants Based on Evaluated Parameters**

Category	Number of Participants
<b>Sex</b>	
Female	56.0
Male	44.0
<b>Environment</b>	
Urban	72.0
Rural	28.0
<b>Age</b>	
<18	9.0
18-30	49.0
>30	42.0
<b>Average Age</b>	27.81
<b>Education Level</b>	
Vocational School	4.0
Middle School	6.0
Post-High School	14.0
High School	34.0
University Education	42.0

For the knowledge level, a final HU-DBI score of 9.57 was obtained, suggesting a moderate to high concern for oral health among the participants, as well as a variety of behaviors and attitudes. (Table III).

**Table III. HU-DBI Scores**

Component	Normalized Score
Knowledge	4.74
Attitude	2.64
Behavior	2.19
Total Score	9.57

The score of 4.74 indicates that participants have an average level of knowledge about oral health. This suggests that, in general, subjects have an average understanding of the importance of dental hygiene, oral care products, and the risks associated with neglecting oral hygiene. This is also the component with the highest score, which suggests a significant concern among

participants to be informed and understand how to maintain their oral health.

The score of 2.64 shows a negative tendency towards oral health. Although participants have a favorable opinion of oral care, not all show consistent commitment or intense concern. This lower score suggests that, while participants are well-informed,

they may not be as motivated or concerned to actively apply this knowledge.

The score of 2.19 suggests poorer practice regarding oral health behaviors. This may indicate a gap between attitudes towards oral health and actual behaviors, reflecting lower commitment to taking concrete actions such as regular brushing, flossing, or dentist visits. This is the component with the lowest score, suggesting that while participants have a positive attitude and are well-informed, there is a discrepancy between their knowledge and actual behaviors.

The final score of 9.57 reflects moderate overall concern for oral health, but below the maximum possible score (12 points). This score suggests a tendency to show good care in terms of knowledge, but there is room for improvement in attitude and behavior. Additionally, the differences between the knowledge score and the attitude and behavior scores suggest that while subjects are more informed, they do not always apply this knowledge in their daily lives.

The KAB scores are much higher compared to the HU-DBI score, with a total of 47 out of a possible 80. These scores reflect a fairly good level of knowledge, relatively responsible behavior, and a healthy attitude toward oral hygiene. For example, most participants agreed that "Fluoride prevents tooth decay" and "Brushing with fluoride toothpaste prevents dental cavities." These responses suggest that participants are relatively well-informed about the importance of oral hygiene products and the risks associated with certain behaviors, such as smoking or consuming sugary drinks. On the other hand, the behavior scores in the KAB are the highest, with a total of 21 points. This suggests that, although participants have good theoretical knowledge about oral hygiene, their behaviors are not always in line with this knowledge. For example, many of them do not regularly use dental floss or mouthwash, even though they are aware of their importance (Table IV).

**Table IV. KAB Scores by Domain**

Domain	Total Items	Total Score
Knowledge	14	11
Attitudes	8	15
Behavior	7	21
Total Score		47

The HU-DBI and KAB scores reflect two different perspectives on oral health behavior and knowledge. While the HU-DBI score evaluates a range of attitudes and behaviors related to oral hygiene and dental health concerns, the KAB (Knowledge, Attitude, and Behavior) score reflects the level of knowledge and awareness about oral health, attitudes towards it, and dental care behaviors.

The scores reflect a balance between awareness of the importance of oral health and daily hygiene practices, which could be improved. Although participants have a good level of knowledge and correct attitudes towards dental care, there are still notable differences between knowledge and actual behaviors. This suggests that, while theoretical information is very important, promoting correct behaviors and implementing them into daily life could be essential for improving the participants' oral health.

The study demonstrates that most participants, especially young adults, understand the importance of oral hygiene, such as brushing twice a day and avoiding attitudes that could harm the oral cavity's health. The attitudes towards oral health that can impact the body are positive, as a high percentage (73%) of subjects agree that dental caries can affect a person's appearance and that smoking can cause oral cancer (88%). According to Chaffee (2021), smoking affects the functions of every organ, causing most deaths through cancer, cardiovascular diseases, and respiratory diseases (8).

Moreover, the research conducted by Spanemberg (2019) highlighted that the presence of periodontal disease, caries, edentulism, and fillings in adolescence causes pain, affects communication, and facial aesthetics (9, 10).

Regarding knowledge of oral health, the results varied. For example, while a high number of individuals are aware that smoking causes oral cancer, there are controversies surrounding the statement "White spots on teeth are called dental plaque." However, there is a higher level of awareness about the effects of periodontal diseases on overall health, especially concerning diabetes. An analysis conducted by Cervino (2019) documented that periodontal disease treatment improves glycemic control by enhancing insulin sensitivity (11).

Additionally, the questionnaires suggest that there are regional differences in behavior and oral hygiene concepts. These discrepancies may be due to variations in health education programs, access to healthcare services, and socioeconomic factors. Gender differences in oral health are minimal, with women being more attentive to maintaining oral hygiene compared to men. However, in the study conducted by Sahibzadi (2021), it was demonstrated that both male students (60.1%) and female students (39.9%) brush their teeth once a day, and men undergo more dental check-ups (12, 13, 14).

The prevalence of young adults (43% aged 18-30) and the gender balance suggest that the collected data are characteristic of a significant segment of the adult population. These individuals have different attitudes and knowledge compared to older people. Young people might be more aware of modern oral health practices and preventive measures, while older individuals focus more on addressing existing dental issues. In the study by Palati (2019), it was highlighted that only 44.66% of older adults underwent an annual check-up, and 72.82% of them visited the dentist. None of them used dentures, despite being edentulous, and only a few had knowledge of oral lesions. The rest considered these lesions as normal changes that occur with aging (15, 16, 17, 18).

The dominance of participants from urban areas (72 subjects) may highlight the concepts, orientations, and behaviors related to oral health specific to this environment, but it may also limit their applicability in rural areas (28 subjects). Differences in the place of

origin may reflect discrepancies in access to healthcare services, education, and concepts about oral and general health (18, 19).

Northridge's research (2020) supports the longstanding recognition of the importance of eliminating inequalities in oral health. The vital role of access to quality dental care for low-income individuals, the uninsured, immigrants, or populations in rural areas has always received insufficient attention. Racial/ethnic disparities in dental visits are exacerbated in rural areas due to isolated and reduced healthcare infrastructure (19). However, the results can guide healthcare professionals in conducting better-targeted information and education campaigns that address the specific needs of young adults in urban and rural areas.

Given the prevalence of participants with a high level of education (42% who have completed university education), it is expected and preferable that they possess more knowledge about the importance of both oral and general health and preventive oral hygiene measures. Knowledge of oral health seems to be mixed. There was an almost equal difference in understanding the fact that replacing a missing tooth improves oral hygiene. Regarding oral hygiene habits, 88% of the participants agree that "Brushing teeth twice a day improves oral hygiene," but there were varied responses about the presence of gum bleeding during brushing: 41% said occasionally, 31% said rarely, and 24% said frequently. Regular dental check-ups are not very common, as 44% said they go occasionally, 31% frequently, and 22% rarely. Only 3% go for dental check-ups often. In the study by Sahibzadi (2021), it was shown that most students considered maintaining good oral hygiene to prevent cavities, and frequent dental check-ups were considered important, along with regular dentist visits (12, 20).

A large proportion of participants (68%) agree that fluoride prevents tooth decay, which was also demonstrated in Štepec et al.'s (2019) study, which supports that fluoride controls the development of carious lesions through its topical effect on the demineralization and remineralization processes occurring at the interface between the tooth surface and saliva (21, 22).

Thus, the two questionnaires tend to reinforce each other's results regarding the awareness of practices and knowledge related to oral health.

## **CONCLUSIONS**

The study demonstrated the knowledge, attitude, and behavior of young adults regarding oral health. The results of the Hiroshima questionnaire show that there is a moderate concern for maintaining oral health, as well as for regularly practicing health-promoting habits.

In the KAB questionnaire, each domain aimed to define the information participants have regarding the etiology of dental diseases, preventive measures, and oral hygiene actions that may have a positive or negative effect on oral health. The results from the behavior domain reflect a positive approach by most participants in maintaining oral health. The results from the attitude domain indicate that the subjects consider oral health to be important and beneficial for the overall health of the body.

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