

## SOCIO-BEHAVIORAL FACTORS THAT INFLUENCE ORAL HEALTH IN YOUNG ADULTS

Adina Oana Armencia<sup>1</sup>, Doriana Agop-Forna<sup>1</sup>, Andrei Nicolau<sup>1</sup>, Irina Bamboi<sup>1</sup>, Anca Rapis<sup>1</sup>, Teona Tudorici<sup>2</sup>, Carina Balcoş

<sup>1</sup>Faculty of Dental Medicine, "Grigore T. Popa" University of Medicine and Pharmacy Iasi

<sup>2</sup>Privat practice

Corresponding authors: [nicolau.andrei@umfiasi.ro](mailto:nicolau.andrei@umfiasi.ro)

<sup>+</sup>All authors have the same scientific contribution and equal rights.

**Abstract:** The study of demographic factors provides valuable insights into how they influence oral health. On the other hand, knowledge, attitudes, and behavior towards oral health are fundamental factors that can determine individuals' dental health status. **The aims of study** is to determine the socio-demographic factors, knowledge, and attitudes regarding oral health, as well as health-related behaviors among young adults in Iași. **Material and Method:** A total of 100 subjects, selected between 2023-2024, were included in the study and grouped according to demographic parameters. The Hiroshima University–Dental Behavioral Inventory (HU-DBI) and the Oral Health-Related Knowledge, Attitudes, and Behaviors (KAB) were used to assess knowledge, attitudes, and behaviors related to oral health. **Results:** The HU-DBI score was 8.2. The KAB score for the knowledge domain was 11, for the attitudes domain, the score was 15, and for the behavior domain, the score was 21. **Conclusions:** The majority of participants, particularly young adults, understand the importance of oral hygiene, such as brushing twice daily and avoiding behaviors that could harm oral health.

**Keywords:** oral health, Hiroshima University–Dental Behavioral Inventory, Oral Health-Related Knowledge, Attitudes, and Behaviors.

### INTRODUCERE

Oral diseases represent a global public health issue; a particular concern is the rising prevalence of oral diseases in many low- and middle-income countries due to broader social, economic, and commercial changes (1).

Oral diseases disproportionately affect members of society. There is a strong and consistent social gradient between socioeconomic 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. Oral diseases and inequalities in oral health are directly influenced by social determinants that underlie poor oral health among the population (1, 2).

The soft and hard tissues of the oral cavity are affected by a wide range of local or general diseases and disorders, including various craniofacial disorders, congenital anomalies, injuries, and various infections. However, the main clinical conditions

considered a global public health priority are dental caries, periodontal (gum) disease, and oral cancer (1, 3).

Individuals' knowledge, behavior, and oral health status are influenced by numerous factors, such as culture, environment, and social habits (4).

Promoting oral health through health education can contribute to improving knowledge and self-care attitudes, as well as reducing inequalities by addressing the implicit determinants of oral health. With a shared understanding, effective oral health promotion programs that focus on developing these skills can lead to better oral health outcomes; in turn, these will impact people's quality of life, not only by enhancing social or emotional well-being but also by achieving better overall health levels for individuals and communities (5, 6).

Therefore, it is important to understand the factors that influence oral health, as well as how to maintain good health and prevent diseases through health-promoting attitudes. For this reason, the purpose of this

study is to determine the socio-demographic factors, knowledge, and attitudes regarding oral health, as well as health-related behaviors among young adults in Iași.

### MATERIALS AND METHOD

The study group consisted of 100 individuals selected during the period 2023-2024, grouped according to demographic parameters: age, gender, place of origin, and the highest level of education completed.

To assess knowledge, attitudes, and behaviors related to oral health, a validated tool, the Hiroshima University–Dental Behavioral Inventory (HU-DBI), designed by Dr. Kawamura Makota, was used. The main objective was to evaluate knowledge, attitudes, behavior towards oral health, and its determining factors. The secondary objectives were to explore associations between knowledge, attitudes, and behavior towards oral health and sociodemographic determinants such as gender and academic year; to investigate the role of dental education programs in oral health; and to explore associations between concern for oral health and risk behaviors such as tobacco smoking and excessive internet use (7).

For calculating the score of this questionnaire, one point is given for each positive response and one point for each negative response. The ratio of the total

affirmative to negative responses provides an estimate of knowledge, attitudes, and behaviors related to oral health. The HU-DBI score has a maximum value of 12 (5 points for knowledge, 3 points for attitude, and 4 points for behavior), and the average value ranges between 2 and 9. If the HU-DBI index is higher than 12, it indicates a greater concern for oral health. The higher the HU-DBI index, the healthier the behavior and the better the oral health. Subjects with a low level of dental diseases have a higher HU-DBI index and better attitudes and behaviors towards dental health (7).

To evaluate the knowledge, attitude, and behavior (KAB) of young adults towards oral health, an online questionnaire was used. The final version of the questionnaire consists of 34 questions, covering four domains: (1) The demographic profile domain includes 5 questions to assess the demographic profile of the participants; (2) The knowledge profile domain contains 14 questions to assess the level of knowledge regarding oral health; (3) The attitude profile domain includes 8 questions to evaluate attitudes towards oral health; and (4) The behavior profile domain contains 7 questions to evaluate behaviors related to oral health. The maximum score of the KAB questionnaire is 89 (14 points for knowledge, 40 points for attitudes, and 35 points for behavior) (Table I) (8, 9).

**Table I. KAB Questionnaire For Oral Health: response options (8)**

Domain	Total Items	Method	Response Options
<b>Socio-demographic factors</b>	5	Age, gender, place of origin, highest level of education completed	Single response option
<b>Knowledge</b>	14	Etiology, clinical manifestation, treatment, symptoms, preventive measures regarding oral health	Yes/No/Don't know 0 = incorrect/don't know, 1 = correct response
<b>Attitudes</b>	8	Individual attitudes based on the Health Belief Model regarding oral health	1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, 5 = strongly disagree
<b>Behavior</b>	7	Various oral hygiene actions that may have a positive or negative effect on oral health	1 = never, 2 = rarely, 3 = occasionally, 4 = very often, 5 = always

The sociodemographic characteristics analyzed include age, gender, highest level of education completed, and place of origin. The

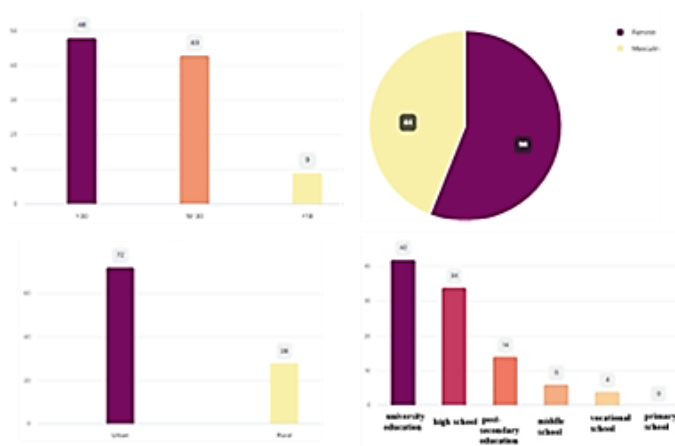
knowledge section of the questionnaire was based on the etiology, risk factors, symptoms, and complications of oral cavity diseases. The

attitudes section of the questionnaire was developed based on the Health Belief Model (HBM). The behavior-related questions were based on preventive strategies for oral health conditions, as approved by the World Health Organization and the Centers for Disease Control and Prevention (8, 10).

### RESULTS AND DISCUSSION

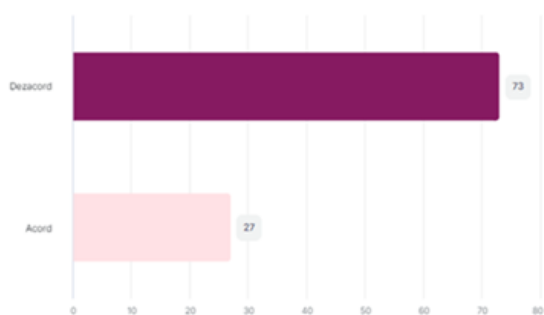
The study group consisted of 56 female and 44 male participants, coming from both urban (72 subjects) and rural (28 subjects)

areas. The majority of participants were aged between 18 and 30 years (49%), followed by those over 30 years old (42%), and then those under 18 years old (9%). Additionally, subjects were selected based on their highest level of education completed, with 4% having completed vocational school, 6% having completed middle school, 14% having completed post-secondary education, 34% having completed high school, and 42% having completed university education (Fig. 1).

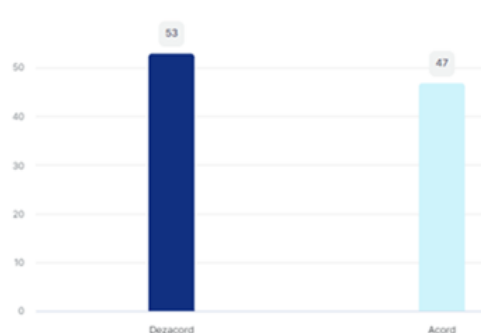


**Fig. 1. Distribution of Subjects by Age, Gender, Place of Origin, and Highest Level of Education Completed**

As shown in Figure 2, only 27% of participants agreed with the statement "I am bothered by the color of my gums," while 73% of them are bothered by the color of their gums.



**Fig. 2. Distribution of Subjects Based on the Response to the Statement "I Am Bothered by the Color of My Gums"**



**Fig. 3. Distribution of Subjects Based on the Response to the Statement "I Have Never Been Taught by a Dentist How to Brush My Teeth"**

It was found that only 53% of subjects had been instructed on the correct method of brushing their teeth, while 47% had not, as indicated by the responses to the statement "I have never been taught by a dentist how to brush my teeth" (Fig. 3).

For the Hiroshima questionnaire, a HU-DBI score of 8.2 was obtained, with the maximum value being 12 and the average value ranging between 2 and 9 (Table II).

**Table II. Distribution of Responses to the Hiroshima Questionnaire**

No.	QUESTION	AGREE	DISAGREE	HU-DBI SCORE
1	I don't worry much about visiting the dentist	63	37	1.70
2	My gums tend to bleed when I brush my teeth	40	60	0.66
3	I am worried about the color of my teeth	52	48	1.08
4	I have noticed some white, sticky deposits on my teeth	40	60	0.66
5	I use a children's toothbrush	8	92	0.08
6	I think I will not be able to avoid having false teeth when I am old	43	57	0.75
7	I am bothered by the color of my gums	27	73	0.36
8	I think my teeth are getting worse despite daily brushing	46	54	0.85
9	I carefully clean every tooth	73	27	2.70
10	I have never been taught by a dentist how to brush my teeth	47	53	0.88
11	I think I can clean my teeth without using toothpaste	26	74	0.35
12	I often check my teeth in the mirror after cleaning them	71	29	2.44
13	I am worried about having bad breath	80	20	4.00
14	It is impossible to prevent gum disease by just brushing teeth	48	52	0.92
15	I delay going to the dentist until I have a toothache	51	49	1.04
16	I have used a disclosing agent to see how clean my teeth are	29	71	0.40
17	I use a toothbrush with hard bristles	34	66	0.51
18	I don't feel I've brushed well unless I use strong strokes	49	51	0.96
19	I feel that sometimes it takes me too long to brush my teeth	37	63	0.58
20	The dentist has told me that I brush very well	51	49	1.04
21	I am satisfied with the appearance of my teeth	51	49	1.04
22	I brush my teeth twice a day or more	66	34	1.94
23	I regularly use dental floss every day	29	71	0.40
24	I regularly use mouthwash	43	57	0.75
25	I am a smoker	46	54	0.85
26	I smoke more than half a pack a day	30	70	0.42
27	I have been smoking for more than a year	40	60	0.66
	<b>FINAL HU-DBI SCORE</b>			<b>8.2</b>

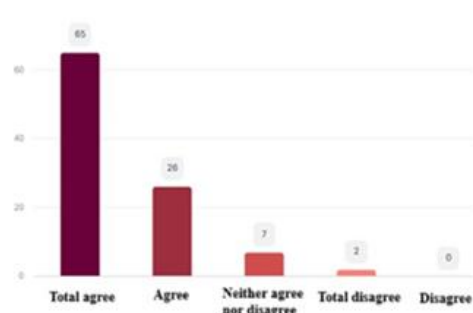
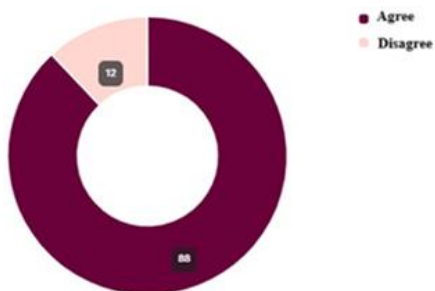
The score obtained indicates a moderate concern for maintaining oral health, as well as health-promoting behaviors and attitudes.

There were significant differences in the responses to the statement "Chewing tobacco or smoking can cause oral cancer," with 12% of subjects selecting disagree or unsure, and 88% agreeing (Fig. 4).

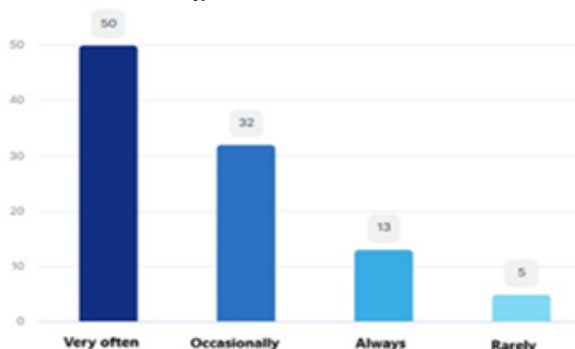
The responses to the statement "Brushing your teeth twice a day improves

oral hygiene" showed that 2% of subjects completely disagree, 26% agree, and 65% completely agree. The remaining 7% neither agree nor disagree (Fig. 5).

For the statement "I give my teeth as much importance as any other part of my body," the responses were quite varied: 50% very often, 32% occasionally, 13% always, and 5% rarely (Fig. 6)



**Fig. 4. Distribution of subjects according to their responses to the statement "Chewing tobacco or smoking can cause oral cancer"**



**Fig. 5. Distribution of subjects according to their responses to the statement "Brushing your teeth twice a day improves oral hygiene"**

**Fig. 6. Distribution of subjects according to their responses to the statement "I give my teeth as much importance as any other part of my body"**

To calculate the KAB score, points were assigned to each statement, resulting in a score for knowledge, attitudes, and behavior. Therefore, for the knowledge domain (14 items), a score of 11 was obtained; for the attitudes domain (8 items), a score of 15 was recorded; and for the behavior

domain (7 items), a score of 21 was achieved. Consequently, the overall KAB score was based on the most frequent responses of the participants, yielding a total value of 47 out of 89 (knowledge: very good (11/14); attitudes: moderate (15/40); behavior: moderate (21/35)). This indicates that participants have good knowledge and a moderate level of positive attitudes and behaviors towards oral health. However, there is room for improvement, particularly in the areas of attitudes and behavior (Table III).

**Table III. Distribution of Responses to the KAB Questionnaire**

Domain	Total Items	Total Score
Knowledge	14	11
Attitudes	8	15
Behavior	7	21
<b>KAB Score</b>		<b>47</b>

The study demonstrates that most participants, particularly young adults, understand the importance of oral hygiene, such as brushing twice daily and avoiding behaviors that could harm oral health. The positive attitudes towards oral health that could impact the body are evident, as a significant percentage (73%) agree that dental caries can affect a person's appearance, and 88% believe that smoking can cause oral cancer (11). According to Chaffee (2021), smoking affects the function of every organ and causes the majority of deaths from cancer, cardiovascular, and respiratory diseases (12, 13).

This distribution suggests that the majority of participants are young adults, which may influence their perspectives and the results obtained. The predominance of

those with a university education indicates a higher level of education among the subjects, potentially affecting their responses and attitudes towards the study's topic. Additionally, the balanced participation of both women and men ensures an impartial approach to the viewpoints of both genders in the responses.

Differences in the participants' place of origin may highlight variations in accessibility and interest in participating in the study, as well as differences in the needs, behaviors, and perceptions of those from rural versus urban areas.

Additionally, research by Spanemberg (2019) demonstrated that periodontal disease, caries, edentulism, and restorations in adolescence lead to pain, an inability to smile, swallow, and chew. Over time, these

conditions can impact communication and facial aesthetics (14).

Regarding knowledge of oral health, the results varied. For example, while a significant number of individuals are aware that smoking causes oral cancer, there are also controversies surrounding the statement, "White spots on teeth are called dental plaque." However, there is a high level of awareness about the effects of periodontal diseases on general health, particularly concerning diabetes mellitus. An analysis by Cervino (2019) found that periodontal treatment improves glycemic control by enhancing insulin sensitivity (15).

In addition, the questionnaires suggest that there are regional differences in oral hygiene behavior and knowledge. These discrepancies may be due to variations in health education programs, access to healthcare services, and socioeconomic factors (16). Gender differences related to oral health are few, with women generally being more attentive to maintaining oral hygiene compared to men. However, in the study by Sahibzadi (2021), it was shown that both male (60.1%) and female (39.9%) students clean their teeth once a day, with men having more dental check-ups (17, 18).

The predominance of young adults (43% between 18 and 30 years old) and the gender balance indicate that the collected data reflect a significant segment of the adult population. These individuals have different attitudes and knowledge compared to older adults. Young people may be more aware of modern oral health practices and preventive measures, whereas older individuals tend to focus more on addressing existing dental issues. In the study by Palati (2019), it was highlighted that only 44.66% of elderly individuals had annual medical check-ups, and 72.82% of them had visited a dentist. None of them used dental prosthetics despite being edentulous, and only a few knew oral lesions. The rest considered these lesions as normal changes that occur with aging (19).

The dominance of participants from urban areas (72 subjects) may highlight the oral health knowledge, attitudes, and behaviors specific to this environment, but it may also limit the applicability of these

findings to rural areas (28 subjects). Differences in the environment of origin may reflect disparities in access to healthcare services, education, and knowledge about oral and general health (20).

Northridge (2020) argues that the importance of addressing inequalities in oral health has long been recognized. The vital role of access to quality dental care for low-income individuals, the uninsured, immigrants, and rural populations has always received insufficient attention. Racial/ethnic disparities in dental visits are exacerbated in rural areas due to isolated and limited healthcare infrastructure (21). However, these results can guide healthcare professionals in creating more targeted awareness and educational campaigns that address the specific needs of young adults in both urban and rural settings.

Given the predominance of subjects with a high level of education (42% having completed higher education), it is expected and preferable that they possess more knowledge about the importance of oral and general health and preventive oral hygiene measures. All correctly recognized the existence of two sets of teeth throughout life and the association between dental infection and gingival bleeding.

However, there was nearly equal disagreement regarding the understanding that replacing a missing tooth improves oral hygiene. Regarding oral hygiene habits, 88% of subjects agreed that "Brushing teeth twice a day improves oral hygiene," but responses about the presence of gingival bleeding during brushing were varied: 41% reported occasionally, 31% rarely, and 24% frequently. Regular dental check-ups are not very common, as 44% reported going occasionally and only 3% visit the dentist frequently.

In the study conducted by Sahibzadi (2021), it was demonstrated that the majority of students believed that maintaining good oral hygiene prevents the development of dental caries and frequent dental check-ups were considered important, as well as the succession of visits to the dentist (17).

A large portion of the subjects (68%) in the study agreed that fluoride prevents tooth decay, which was also supported by the study

of Štepec et al. (2019), which states that fluoride controls the development of carious lesions through its topical effect on the processes of demineralization and remineralization occurring at the interface between the tooth surface and saliva (22).

However, the study based on the two questionnaires presents certain limitations related to: the small sample size, socio-demographic factors, the subjectivity of responses, the design of the statements, and the period covered. Additionally, information related to ethnicity, religion, and cultural differences was not considered, which means the results may not accurately reflect the beliefs and behaviors of all population segments. The questionnaires were completed within a short time frame (1 year), which may not be sufficient to integrate more varied responses. Furthermore, external factors during this period (e.g., a public health campaign) may have influenced the responses.

The responses are subjective, reflecting individual perceptions of the subjects. They provide limited data and do not capture in detail the motivations and reasoning behind the choices made.

## CONCLUSIONS

The Hiroshima questionnaire highlights a moderate concern for maintaining oral health among participants, as well as for practicing regular health-promoting habits. Therefore, it is essential to emphasize the importance of using adjunctive

oral hygiene tools, such as dental floss and mouthwash.

In the KAB questionnaire, each domain was designed to delineate the information participants possess about the etiology of dental conditions, preventive measures, and oral hygiene actions that might have a positive or negative effect on oral health. Based on the predominant responses of the subjects, it is evident that the majority have good knowledge about the clinical manifestations of oral conditions, as well as the symptoms and prevention methods. However, there is a moderate attitude and behavior towards oral health among the remaining participants.

Behavioral results reflect a positive approach from the majority of participants in maintaining oral health, such as daily tooth brushing. Nonetheless, there is uncertainty regarding the importance of regular dental check-ups.

Attitudinal results indicate that subjects consider oral health important and beneficial for overall health, but they do not fully understand the role of the dentist in prevention.

The study results provide an overview of knowledge and attitudes regarding oral health within a diverse population, suggesting the importance of education and access to new concepts and facilities to improve it. However, more extensive and inclusive studies are needed to ensure that all demographic groups are adequately represented and their specific needs addressed.

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