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# The Oral Health and Comorbid Diseases Knowledge Between Urban and Rural Community during Pandemic

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## Abstract

The restriction of social mobility and activity during the COVID-19 pandemic has been implemented to stop the deadly transmission of the SARS-CoV2 virus. People are forced to stay at home and strictly perform the COVID-19 health protocol in their daily activities. Currently, a continuous self-maintenance of the health, including oral health, is considered the best strategy worldwide. This community service activity aimed to assess the knowledge of the urban and rural adult community about oral health, comorbidity, and the quality of life (QoL) during this pandemic situation by using a pre-and post-test quasi-experimental design with an intervention of health-knowledge sharing using leaflets and videos, and a WHOQOL 2012 questionnaire to study the QoL. Paired t-test was used as statistical analysis. Total respondents were 131 (n = 76 for urban and n = 55 for rural), selected using the purposive sampling method. There was a significant difference between the results of the pre-test and post-test in both urban and rural groups (t count ranged from 1.69 to 5.98; p <0.05). Based on the WHOQOL 2012 questionnaire, both urban (90.79%) and rural (87.27%) respondents indicated a good QoL, while the remaining was scored as medium. Physical conditions/pain was the main domain that directly affects the QoL in both communities. It could be concluded that the knowledge-sharing intervention to the community gave a good impact in enhancing the knowledge of the respondents, however, a continuous program should be further carried out for better results.

## Introduction

The current state of the COVID-19 pandemic has lasted more than a year and has forced people to limit their mobility and social activities. As a result, the order of people's lives, such as economic conditions, also has a negative impact (Pak et al., 2020; Allen et al., 2020), so an effort is then needed which is expected to overcome these problems. The wider community living in densely populated urban areas and other areas, are equally affected by the economy and health. The Indonesian and regional governments have then issued policies in the form of a COVID-19 health protocol so that people's lives can take place again but do not endanger public health (Ministry of Health, 2020; Herdiana, 2020), which includes: maintaining distance between humans when interacting; staying at home more or avoiding high mobility; maintain body hygiene, including regular hand washing; improve immunity and maintain body health, including maintaining

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oral health; and use a mask if you have to leave the house or when needed (Ministry of Health, 2020). We expect the guidelines can be followed by the public to prevent the spread of SARS-COV2.

The SARS-CoV2 virus, as the cause of COVID-19, has mutated several times with virus characteristics that are more infectious, making medical treatment more difficult (Callaway, 2021). It can be seen from the increase in the number of positive COVID-19 cases in Indonesia and several other countries some time ago. The main triggering factor for this increase is said to be due to the uncontrolled movement of people, accompanied by a lack of public awareness of implementing the correct and disciplined health protocols (Sharma et al., 2021). This viral infection becomes more dangerous and hard to treat if it attacks individuals with comorbid diseases, like hypertension and diabetes mellitus, or other comorbidities such as malignancy (cancer). Risk factors for hypertension include high cholesterol in the blood (hypercholesterolemia), while one of the risk factors for malignancy is smoking (Fang et al., 2020; Zhou et al., 2020; Nandy et al., 2020; Huang et al., 2020; Liu et al., 2020; Pathania et al., 2021).

Efforts that can prevent comorbid diseases are to control risk factors, including maintaining blood sugar and cholesterol levels within normal limits, maintaining blood pressure in the normal range, and stopping smoking (Samadian et al., 2016). Good knowledge about the causes, signs, and early symptoms of a disease is also expected to help reduce disease risk factors, reduce the severity of the disease, and help improve quality of life. Sufferers can seek help as soon as they feel these signs and symptoms (Wake, 2020).

In addition to systemic comorbid diseases, oral disease is also a factor that can interfere with a person's quality of life (QoL), including during a pandemic. Oral health is needed to maintain the body's immunity because the mouth serves as the entrance for nutritious food and drinks. Oral health is a reflection of the body's general health, which is influenced by various things related to the body's immunity, including nutritional intake, fluid intake, stress conditions, hormonal balance, the balance of body activities, and viral and fungal infections (Riad et al., 2021). The most common oral mucosal disease is stomatitis, or inflammation of the oral mucosa in the form of ulcerated lesions, painful, and can reduce a person's quality of life (Riad et al., 2021), but research on stomatitis and other oral mucosal diseases has not been found.

The pandemic period allows a person to experience stress, lack of nutritious food intake, and lack of body activity, making it possible to get certain oral mucosal diseases (Riad et al., 2021; Sinadios and Shelswell, 2020; Kitakawa et al., 2020). A study on the community dental and oral health status that had been carried out during the COVID-19 pandemic, using a questionnaire, stated that many people complained about cavities and sore teeth (Balafif et al., 2021), but did not discuss oral mucosal diseases. The results of another study stated that community dental and oral health status was related to the stress conditions experienced related to mobility restrictions during the pandemic (Susanto et al., 2020). Both studies did not assess the QoL of the respondents.

QoL is a human perception of his position in life in terms of culture, behavior, and the value system in which a person lives. QoL is also related to one's expectations, pleasures, and standard of living (Soósová, 2016). A research result states that the QoL of individuals who are active in physical activity is better than those who are more passive (Lesser & Nienhuis, 2020). A person's physical activity can be disrupted, if he is experiencing a specific disease reducing the daily QoL. It becomes worse if the disease lasts a long time/chronic, or recurs. Pain, social and psychological pressure, and helplessness due to an illness, further reduce a person's quality of life. Differences in social and cultural relationships of people according to their domicile are also known to affect differences in QoL (Sitlinger & Zafar, 2019).

Therefore, the study purpose was to measure the level of public knowledge about oral health and disease, prevention of COVID-19 infection and comorbid diseases, as well as QoL related to health problems. This study will compare the conditions in urban communities

(large and densely populated cities) and rural communities. The results of this study could be used for further studies and to improve health education materials in the community, especially related to oral health and disease, prevention of Covid-19 infection, and comorbid diseases that can reduce QoL during this pandemic.

**Research Method**

This research is a health education intervention research with a pre-test and post-test quasi-experimental design and has been approved by Padjadjaran University with Certificate No. 1828/UN6.1.1/PM/2020. The measuring instrument is an electronic questionnaire (google form) distributed through the WhatsApp network by the Research Team. The research population is the general adult population. The purposive sampling was used to recruit respondents with adult criteria (aged > 18 years), willing to fill out complete electronic pre-test and post-test questionnaires and to take part in counseling provided online in the form of leaflets or e-posters (shared through Whatsapp) and videos (https://www.youtube.com/channel/UCCQBGHqNqldX90UENn7dAbA/videos). The counseling materials were given between the pre-test and post-test times.

The research flow begins with sending pre-test electronic questionnaires to respondents to fill out, then sending health education materials in the form of posters and video links to respondents for the study, and ends with sending post-test electronic questionnaires to respondents to fill out. Details of the contents of the pre and post-test questionnaires consist of demographic data, namely: age, gender, last education level, occupation, and income. In addition, the questionnaire also contains questions regarding matters related to smoking habits and disease history, both at the time of filling out the questionnaire and before, previous hospital treatment experience, and current medication. Table 1 shows the recapitulation of research respondents' self-data when Table 2 shows the recapitulation of data on smoking history, other medical histories, and health-related QoL or HRQoL categories of respondents' quality of life. Tables 1 and 2

show the data recapitulation after dividing the groups based on the respondents' domicile/place of residence, namely urban community groups (living in the cities of Jakarta, Bekasi, and Bandung) and rural (living in districts/cities other than Jakarta, Bekasi, and Bandung). Score calculation per dimension is obtained by calculating the number of times the respondents answered the question with points according to the provisions. The QoL assessment of each individual is also calculated by adding up the points according to each individual answer (total point range 0 – 24/individual). The QoL level is divided into three categories, namely "good" if the total points are between 0-8; "medium" if the total points are between 9-16; and "bad" if the total points are between 17-24.

There are three groups of questions in the questionnaire, which consist of 8 (eight) questions regarding oral health and thrush, 14 (fourteen) questions regarding knowledge related to comorbid diseases, and 5 (five) questions related to preventing COVID-19 infection. Each correct answer gets a score = 10, the wrong answer scores = 0. The total score of all respondents is then divided by the number of respondents to get the average score for each group of questions. The normality of the data distribution was tested using the normality test calculator (https://www.gigacalculator.com/calculators/normality-test-calculator.php). The mean pre-test scores were then compared with the post-test mean scores in the same group of respondents, to evaluate changes in scores after the health education intervention and statistically analyzed using paired t-test. Furthermore, the difference in the mean scores of pre-test and post-test between groups of respondents (urban and rural communities) was analyzed using an unpaired t-test with differences in variance and number of samples.

QoL of respondents was measured using the WHOQOL 2012 questionnaire (https://www.who.int/tools/whoqol) modified more simply, covering six dimensions. Namely: environmental, physical, psychosocial, level of independence, social relations, and spiritual (results as shown in table 5). The scoring system is as follows: answer "never" score = 0; "rarely" score = 1; "sometimes" score = 2; "often" score = 3; and "very often" score = 4.

**Results and Discussions**

A total of 131 respondents are willing to participate in this study, namely, 76 respondents are domiciled in Jakarta, Bekasi, and Bandung (in this study categorized as urban), while 55 respondents live in other cities/regencies, namely: Bandarlampung, Garut, Tasikmalaya, Subang, and others (in this study called rural). Table 1 shows the data recapitulation of the demographic characteristics of the respondents.

TABLE 1. Demographic Characteristics of Research Respondents

| Category | | Urban Respondent (n=76) | Rural Respondent (n=55) |
|---|---|---|---|
| Age | Age 18 - <30 | 62 | 31 |
| | Age 30 – 39 | 4 | 4 |
| | Age 40 – 49 | 4 | 8 |
| | Age 50 – 59 | 4 | 7 |
| | Age ≥ 60 | 2 | 5 |
| Gender | Male | 30 | 16 |
| | Female | 46 | 39 |
| Education | Primary or equal | 1 | 2 |
| | Junior High or equal | 2 | 2 |
| | Senior High or equal | 54 | 22 |
| | Diploma | 3 | 1 |
| | Graduate (S1) | 15 | 26 |
| | Post Graduate/Master (S2) | 1 | 2 |
| Occupancy | University student | 42 | 26 |
| | Entrepreneur | 7 | 9 |
| | Housewife | 5 | 9 |
| | Labour | 0 | 2 |
| | Unemployment/Retirement | 2 | 1 |
| | Private worker | 16 | 6 |
| | Police/Military (TNI)/Civil Servant (ASN) | 4 | 2 |
| Income | Not yet/No Income | 44 | 31 |
| | < Average Minimum Wage (UMR) in residential region | 11 | 2 |
| | Same as UMR in residential region | 6 | 2 |
| | > UMR in residential region | 15 | 20 |

Note: UMR = average minimum wage.

The sociodemographic characteristics of the respondents (Table 1) show that they are between 18-66 years old, most of whom are 18 to less than 30 years old (81.58% in the urban group, 56.56% in the rural group). The majority of respondents are women (60.52% in the urban group, 70.91% in the rural group), and most of the respondents are not/not yet earning, because they are student respondents. Most of the respondents with high school education (SMA) or students are expected to be able to support the readiness of respondents to maintain dental and oral health, as well as to safely undergo the COVID-19 pandemic. According to Wake (2020), respondents' sociodemographic data can affect the status, maintenance efforts, and level of knowledge related to a person's health to support a good quality of life (Wake, 2020).

The respondent's health characteristics related to smoking habits and disease history

are as an assessment of the quality of life-related    to health problems, listed in Table 2.

TABLE 2. Data on Smoking Habit, History of Diseases, and Categories of Quality of Life related to Health Problems (n respondents=131)

| Category n | | Urban Respondent (n=76) | | Rural Respondent (n=55) | |
|---|---|---|---|---|---|
| | | % | n | % | |
| | No | 67 | 88,16 | 54 | 98,18 |
| **Smoking Habit** | Yes | 9 | 11,84 | 1 | 1,82 |
| | No | 59 | 77,63 | 43 | 78,18 |
| Currently suffering from illness | Yes | 17 | 22,37 | 12 | 21,82 |
| | No | 48 | 63,16 | 33 | 60 |
| Past Medical history | Yes | 28 | 36,84 | 22 | 40 |
| | No | 44 | 57,89 | 35 | 63,64 |
| History of hospitalization | Yes | 32 | 42,11 | 20 | 36,36 |
| | No | 69 | 90,79 | 45 | 81,82 |
| Are taking medication | Yes | 7 | 9,21 | 10 | 18,18 |
| | Good | 69 | 90,79 | 48 | 87,27 |
| Quality of Life Related to Health Problems | Average | 7 | 9,21 | 7 | 12,73 |
| | Poor | 0 | 0 | 0 | 0 |

Source: Primary Data, 2020.

Most respondents have good health conditions as indicated by not smoking (88.16% in the urban group, 98.18% in the rural group), not suffering from certain diseases (77.63% in the urban group, 78.18% in the rural group), have no history of illness or hospitalization, and are not currently taking medication. Respondents who have a smoking habit consume between 4-12 cigarettes/day (urban communities) or 1-4 cigarettes/day (rural communities), while the length of stay in hospital 1-2 times so far, ranging from one day to one month (urban communities), or two days to two weeks (rural communities). Types of diseases that are currently or had, consist of gastritis, asthma, allergies, cough, colds, hypertension, pulmonary tuberculosis, gastroesophageal reflux disease, typhoid, dengue fever, sinusitis, and toothache, but none of them with malignancy. Some of these diseases are chronic or recurrent diseases, which sometimes require regular treatment, and if they are infected, they can reduce a person's quality of life.

Smoking is a bad habit that can affect a person's general and oral health status. Things related to a history of disease and drug consumption are conditions that are expected to affect a person's quality of life. Smoking habits also harm the ability of the lung capacity to function daily as well as increase the risk of developing lung cancer and increase the risk of developing oral cancer. It is related to the characteristics of the COVID-19 virus infection that attacks lung cells and causes shortness of breath, as well as the decline in oral health due to smoking, making it easier for a person to experience a worsening if infected with COVID-19 infection (Kashyap et al., 2020). A person with a smoking habit or a history of disease and consumption of certain drugs needs special attention and needs to be given health education to avoid COVID-19 infection and possible complications.

Table 2 also shows that the majority of respondents have a good QoL, namely 90.79% urban people and 87.27% rural people. A small proportion of respondents have a moderate quality of life, namely 9.21% in urban communities and 12.73% in rural communities, and none of them show poor quality of life (0%). From this data, in general the QoL of urban communities is better than that of rural communities.

Our study is in line with an oral health-related QoL (OHRQoL) study in Kutai Kartanegara, Kalimantan, which states the influence of factors such as individual, social status, household settings, daily habits, and other local factors. This article concludes that the OHRQoL of urban communities is better than that of rural communities (Husain and Tatengkeng, 2017).

A similar study in the USA concluded that rural people, especially the elderly, had lower HRQoL scores than urban people because, generally, the elderly lived apart from their families. It was also stated that black and Hispanic ethnicity showed lower scores than whites (Baernholdt et al., 2012).

Furthermore, table 3 shows the difference in the knowledge between urban and rural community groups regarding oral health and

disease, efforts to prevent Covid-19 infection, and comorbid diseases. The results of the pre-test assessment showed a significant difference (t count>1.66; p <0.05) in the level of knowledge of respondents between urban and rural communities. Interestingly, from the results of the post-test assessment, only knowledge related to the prevention of Covid-19 infection had a significant difference between the two groups of people (t count < -1.66), while the answers to questions related to oral health and comorbid diseases were not significantly different (- 1.66<t count<1.66; p<0.05). It can be said that this health education intervention can affect the increasing knowledge of oral health and comorbid diseases in both community groups. But COVID-19 prevention knowledge still requires further intervention, especially in urban groups.

TABLE 3. Differences in Knowledge Levels between Urban and Rural Communities on Oral Health, Prevention of COVID-19 Infection, and Comorbid Diseases

| | Knowledges | Pre test | | | Post test | | |
|---|---|---|---|---|---|---|---|
| | | Urban Community Average Score | Rural Community Average Score | t count | Urban Community Average Score | Rural | t count |
| 1. | Oral Health | 61,84 | 65,45 | 1,81 | 70,13 | 70,36 | **0,13** |
| 2. | Prevention of COVID-19 Infection | 41,32 | 36,55 | 4,19 | 43,68 | 44,00 | -0,22 |
| 3. | Comorbid Diseases | 97,63 | 104,91 | 12,57 | 115,39 | 120,18 | **1,56** |

Note: t table = -1,66 and 1,66; accepted H0: if -1,66 < t count <1,66 (there is no difference in the mean score)

Table 4 shows the differences in the results of the pre-test and post-test in each urban and rural community group. The results of the pre-test showed a significant difference (t count>1.66; p <0.05) between the mean pre-

test and post-test scores in the three knowledge groups and in the two groups of people who were respondents. It means that the extension intervention provided can significantly increase public knowledge.

TABLE 4. Differences in Pre and Post-test Knowledge Levels in the Community about Oral Health, Prevention of COVID-19 Infection, and Comorbid Diseases

| | Knowledges | Urban Community (n=76) | | | Rural Community (n=55) | | |
|---|---|---|---|---|---|---|---|
| | | Pre-Test Average Score | Post-Test Average Score | t count | Pre-Test Average Score | Post-Test Average Score | t count |
| 1. | Oral Health | 61,84 | 70,13 | 5,03 | 65,45 | 70,36 | 2,73 |
| 2. | Prevention of COVID-19 Infection | 41,32 | 43,68 | 1,69 | 36,55 | 44,00 | 4,37 |
| 3. | Comorbid Diseases | 97,63 | 115,39 | 5,98 | 104,91 | 120,18 | 4,49 |

Note: t table = -1,66 and 1,66; accepted H0: if -1,66 < t count <1,66 (there is no difference in the mean score)

Oral health is an integral part of the general health of the human body. Knowledge of oral health maintenance is vital because the mouth is the entry point for nutrition and hydration. It maintains human health. On the other hand, sprue is a disease of the oral cavity. It can reflect general health status. Sprue can also arise if it is triggered by stressful conditions (Riad et al., 2021). In this case the COVID-19 pandemic condition can also be a factor causing stress in a person (Susanto et al., 2020). The public needs to know the truth about sprue, can be experienced by anyone of any age.

Based on the results, both urban and rural communities already have good knowledge of a healthy mouth, proper oral health care, description of sprue, things that cause sprue, and types of food to prevent sprue. This health education intervention can increase knowledge about the definition of sprue and food/drinks for the prevention. What still needs attention is the habit of washing hands before eating and drinking, as an effort to prevent sprue, because most of the respondents did not answer this question correctly. Washing hands habit, in addition to the transmission of COVID-19 infection prevention, can also prevent the occurrence of sprue caused by viral infections (Sinadinos & Shelswell, 2020; Kitakawa D, 2020).

Sprue is an ulcerated lesion of the oral mucosa that causes pain, can interfere with daily oral function activities, and reduce QoL (Noviana et al., 2018). The condition is highly correlated with QoL. Sprue prevention is by maintaining the body's immune and supported by good oral and body hygiene (Riad et al., 2021; Balafif et al., 2021). Thus, necessary to provide counseling materials regarding oral mucosal health and sprue for the community. Especially for vulnerable communities. Namely patients with certain systemic diseases, children and adolescents, pregnant women and productive women, and the elderly.

The next level of knowledge measurement is about preventing COVID-19 infection using a questionnaire including five questions related to the prevention of transmission, which is from other people transmitted or transmitting to others. Three things resulted from the respondent, before being counseled, having a good level of knowledge, namely in terms of preventing transmission when outside the home, after touching objects in public places, and about the transmitting or spread of the virus. After the counseling, the respondents' post-test results on these three things showed an increase. However, there are also two other things that indicate that respondents do not have good knowledge even after being given counseling, namely related to the equipment that must be worn to prevent transmission in public places and what to do when you return home after traveling. Based on these results, this study recommends strengthening counseling materials. Regarding personal protection that a person must wear to prevent transmission in public places and activities carried out if someone has returned home after traveling during this pandemic, related to efforts of COVID-19 infection prevention.

The results are supported by data in Indonesia that there has been an increase in transmission originating from public places, such as office clusters, worship clusters, social gathering clusters, and others. Most of the respondents in this study knew that the mode of transmission of the SARS-CoV2 virus was through droplets of saliva, coughing, or nasal secretions, knowing what to do outside the home, such as maintaining a safe distance of interaction and the need for adequate ventilation. Likewise, it is imperative to wash your hands frequently, especially after touching items in markets/shops/other public places. However, if you do not understand the completeness of personal protection that must be worn, such as masks, glasses, and face shields, you will still have the risk of contracting or transmitting infections. The occurrence of transmission in household clusters is also thought to be related to the low level of public knowledge about things to do after returning home from traveling during this pandemic. Each family member should be able to carry out the routine of bathing, brushing teeth, and washing hair every time they arrive home from traveling. If these things are not solved, then there is a possibility that the family member can infect other family members in their home.

Various communication methods by the government, like providing information on

health protocols related to COVID-19 infection prevention in the community, whether through television broadcasts, internet-based social media, and direct counseling in the community. So that the community can obey (Kemenkes, 2020). The obstacle often found to change health behavior is the low awareness of the community itself. Public awareness, could be improved by increasing knowledge through regular counseling. Periodic counseling is an effort to provide repeated exposures that can build and strengthen one's knowledge and change his behavior toward a healthier life (Ngigi & Busolo, 2018).

Knowledge about comorbid diseases also needs to be given to the larger community because it is related to the severity of the COVID-19 infection. The respondent's knowledge about this comorbid disease includes the definition, prevention efforts, recognition of signs and symptoms, and long-term effects, whether on hypertension, diabetes mellitus, and malignancy. This study also explored the respondents' knowledge about herbal remedies to reduce the symptoms of these diseases. Nowadays, the use of herbal medicines in the community increased, which should be accompanied by evidence-based medicine. Herbal medicines are said to have insignificant side effects, and according to traditional culture preparation of some is relatively easy, just by

boiling. However, the use of herbal medicines must still meet the rules. To prevent unexpected things. Habits in traditional Indonesian society, namely consuming herbal ingredients/herbs, can also help reduce the risk of the disease. Various herbal medicines have been studied and have efficacy in reducing the symptoms of comorbid diseases, such as helping to reduce headaches due to hypertension (Chrysant & Chrysant, 2017) and helping to lower blood sugar levels (Trojan-Rodrigues, 2012).

Comorbidity can be prevented from occurring or worse. One of which is by recognizing the originator or recognizing the signs and symptoms of the disease. If someone knows the originator of a disease, they will at least try to avoid it (Samadian et al., 2016). Knowledge of the signs and symptoms also needs to be known or used as material for public health education. Because by knowing the signs and symptoms early on, the community can immediately find a solution for its management which is expected to reduce the severity of the disease and increase a person's QoL (Ministry of Health, 2020). The results of this study indicate that knowledge about the signs and symptoms of cancer still needs to be strengthened in future counseling. Furthermore, Table 5 presents data on the health-related quality of life assessment (HRQoL) of respondents.

TABLE 5. Assessment of the Dimensions of Research Respondents Quality of Life Related to Health Problems That Most Affected

| Dimensions of Quality of Life Related to Health Problems | Total Score per Dimension | |
| --- | --- | --- |
| | Urban Community (n=76) | Rural Community (n=55) |
| 1.  Physical Dimension | 68 | 45 |
| 2.  Psychosocial Dimension | 57 | 40 |
| 3.  Environment Dimension | 43 | 23 |
| 4.  Independence Level Dimension | 40 | 24 |
| 5.  Social Relation Dimension | 27 | 26 |
| 6.  Spiritual Dimension | 22 | 19 |

Source: Primary Data, 2020

Table 5 shows an overview of the QoL dimension assessment. Most of the respondents stated that they had never experienced difficulties, worries, and disturbances related to their health problems, it is in line with the respondents' medical history and medication data. Based on the assessment of the total score per dimension, the physical dimension (feeling sick/painful) and the psychosocial dimension (feeling worried) are the ones that have the most impact on the QoL of the two groups of respondents. The next order of dimensions affected in urban communities is the environmental dimension (difficulty

moving), the level of independence (feeling disturbed to the point of stopping activities), social relations (feeling shy/irritable), and the spiritual dimension (feeling surrendered and helpless). In contrast to rural communities, after the physical and psychosocial dimensions, the next affected dimensions are the dimensions of social relations, the level of independence, the environment, and finally the spiritual dimension.

Several studies on HRQoL during the pandemic have also been reported. Research on adult respondents in China during this pandemic stated that 65% of respondents showed good QoL. Efforts to increase the percentage of QoL like through changes in diet in 23% of respondents, and 30% of respondents stated that they consumed more fruit, vegetables, and milk during the isolation/quarantine period than before. 75.2% of respondents said they had felicitous sleep quality. Efforts to improve diet and sleep quality have been shown to increase QoL (Wang et al., 2020).

A study during the pandemic in Spain that used an online questionnaire stated that 39.7% of respondents had poor QoL, 44.7% of respondents did not do physical activity during the isolation/quarantine period, while 21.8% of respondents stated that they consumed food because of stress (emotional). eater) and 11% of respondents consumed food because they were very stressed (very emotional eaters), and 38.8% of respondents experienced weight gain, but 31.1% experienced weight loss (López-Moreno et al., 2020). Another study, using a survey based on Facebook social media, also stated that during this pandemic a total of 22% of respondents experienced weight gain during the isolation period at home/quarantine. It was triggered by stress or the habit of consuming snacks after dinner, sleeping irregularly, and decreased physical activity (Zachary et al., 2020). Things considered the weight gain related to stressful conditions need to be considered in subsequent health education materials because they are also related and are risk factors for canker sores and comorbid diseases in COVID-19 infection.

## Conclusions

Research and counseling on oral health knowledge, quality of life, and comorbid diseases during the pandemic have been carried out in urban and rural communities. The intervention using health education showed a significant increase in the knowledge of urban and rural communities about oral diseases, health protocols during the COVID-19 pandemic, and comorbid. In general, the HRQoL scores of the two community groups showed good conditions, but the urban community is better than the rural. From the results of this study, it can be suggested that similar programs should be sustainable so that the government's goal of stopping the pandemic can be successful, taking into account the general characteristics of the community according to where they live. Several things related to health education materials also still need to be repeated and strengthened. So that they affect on improving public health.

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