Factors Influence the Knowledge, Attitudes, and Behavior of Community about COVID-19 Vaccine in Medan City, Indonesia

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Abstract

BACKGROUND: COVID-19 has been pandemic and causes death worldwide. 905 people died in the capital of North Sumatra, Medan City, Indonesia until November 2021. Medan city was once a red zone including Medan Denai District, the first dose of vaccination coverage was still 60% (1,476,248 people) and the second dose was still 45.8% (1,116,271 people) in November 2021. Public awareness of the importance of COVID-19 vaccination is needed to succeed in vaccination programs and reduce the rate of COVID-19 cases. Nevertheless, research related to public awareness about COVID-19 vaccination was still little done in Medan city.

AIM: In this study, we analyzed the factors that influence the knowledge, attitudes, and behavior of community about COVID-19 vaccine in Medan Denai District of Medan City.

METHODS: This study was a cross-sectional study with a validated questionnaire approach in 100 respondents. Data collection were conducted from September to November 2021. The questionnaire consisted of 36 questions to assess the level of knowledge, attitudes, and behavior. Statistical analysis was done using IBM Statistical Package for the Social Sciences v.26, p < 0.05 was statistically significant.

RESULTS: Knowledge level is sufficient by 50%, good attitude by 99%, good behavior by 82%, the majority of respondents were in the age range of 17–25 years (75%), women (58%), high school education level (63%), jobless (42%), low income (62%), and had a religion (100%). More than 80% of respondents knew the benefits of the vaccine, how the vaccine worked, vaccine brands available in Indonesia, 76% had been vaccinated and 97% agreed to be vaccinated. We found a relation between knowledge with community behavior, education level, and vaccination history with knowledge, religion with community attitudes, and COVID-19 vaccination history with community behavior (p < 0.05).

CONCLUSIONS: Respondents had sufficient knowledge, good attitudes and good behavior related to the COVID-19 vaccine. The level of education, religion, and COVID-19 vaccination history affected the knowledge, attitudes, and behavior of people about the COVID-19 vaccine in Medan Denai District, Medan city, Indonesia.

Introduction

On January 30, 2020, the WHO declared that the coronavirus (SARS-CoV-2) outbreak was a public health emergency and became an international concern due to the increasing number of confirmed cases, not only in China but in other countries [1]. SARS-CoV-2 is a new type of virus that has never been found in humans before, and the animals that transmit it are not yet known [2]. The SARS-CoV-2 virus is a round-shaped virus with spike (S) proteins that protrude from the surface of virus particles (virions) and have a single-chain RNA-shaped genetic material [3]. COVID-19 infection can cause mild, moderate, or severe symptoms with the main clinical manifestations being fever (temperature > 38°C), cough, and shortness of breath [4].

Cases of death and the addition of positively confirmed cases in the world have increased, in November 2021 there were 253 million positive confirmed cases and the number of deaths reached 5.09 million people [5]. In Indonesia, the development of daily cases of COVID-19 in November 2021 showed that death cases reached 143,644 and total cases reached 4,250,516 people and in North Sumatra, the number of positive cases reached 105,868 and the number of deaths reached 2,887 people [6]. In Medan city as of November 14, 2021, the number of positive cases reached 48,152 and the number of deaths reached 905 people [7].

The target of vaccination in Indonesia is 181,554,465 population. As of November 14, 2021, the number of people who have received the first dose of the vaccine is 129,710,190 people and the second dose of the vaccine is 83,418,086 people [8]. Medan city was
once a red zone, the first dose of vaccination coverage was still 60% (1,476,248 people) and the second dose was still 45.8% (1,116,271 people) in November 2021. Medan Denai district located in Medan City is included in the red zone [9].

The previous surveys showed that 658 respondents were known to be willing to receive the government-provided COVID-19 vaccine, and 8% of them refused to accept it. The remaining 274 people doubted the government’s plan to distribute the COVID-19 vaccine. Respondents expressed concern about the safety and effectiveness of vaccines, expressed distrust of vaccines, and question the level of vaccine validity [10]. Other studies also mention that factors that affect people’s willingness to receive vaccinations are factors of age, education level, occupation, marital status, religion, and ethnicity. The protective determinant of people’s willingness to receive COVID-19 vaccination is age and religion [11]. The previous studies are still very limited related to the analysis of the level of knowledge, attitudes, and behavior of the community about the COVID-19 vaccine and the factors that affect these three things, especially in the city of Medan. The level of knowledge, attitude, and good behavior about the COVID-19 vaccine is certainly an important factor to succeed COVID-19 vaccination activities and becomes a parameter to assess the success of education and health promotion programs conducted by the government [12].

Methods

Study design

This study is an observational analytical study with a cross-sectional approach. The sampling method used the Slovin formula in 148,438 population in Medan Denai district so that 100 respondents were obtained. The survey was conducted from September to November 2021. Data collection was done by sending questionnaires in the form of Google Forms in the Medan Denai subdistrict community. The questionnaire was validated using the Univariate correlation validation test (Pearson) and the Croanbach Alpha reliability test.

The questionnaire consisted of respondents’ characteristic data, 36 questions included 16 questions to assess the level of knowledge, 10 questions to assess attitudes, and 10 questions to assess behavior. The allotted time is 30 min and the data is automatically stored in the database and kept confidential. This research was conducted after approval from the ethics committee of the University of North Sumatra No.754/KEP/USU/2021.

Analyses

Data were analyzed using a statistical package for social sciences software v.26.0. Data on respondents’ characteristics, levels of knowledge, attitudes, and behaviors are presented in the form of n (%). The relationship between respondents’ characteristics and levels of knowledge, attitudes, and behavior was analyzed using the Chi-Square test, Fischer Test, Kolmogorov-Smirnov test, and Kruskal-Wallis test. p < 0.05 was considered statistically significant.

Results

Demographic characteristics

The majority of respondents to the study had an age range of 17–25 (75%), female (58%), jobless (42%), high school education (63%), Protestant Christians (81%), low income (62%), had no history of exposure to COVID-19 (81%), had no family history of exposure to COVID-19 (72%), had a personal and family history of COVID-19 vaccination (76%) and (87%), and was willing to be vaccinated (97%). The characteristics of respondents are shown in Table 1:

| Subject characteristics | Frequency | Percentage |
|-------------------------|-----------|------------|
| Age group               |           |            |
| 17–25                   | 75        | 75         |
| 26–35                   | 9         | 9          |
| 36–45                   | 7         | 7          |
| 46–55                   | 9         | 9          |
| Gender                  |           |            |
| Man                     | 42        | 42         |
| Woman                   | 58        | 58         |
| Last education          |           |            |
| No education            | 1         | 1          |
| Junior High School      | 1         | 1          |
| Senior High School      | 63        | 63         |
| Diploma                 | 6         | 6          |
| Bachelor                | 28        | 28         |
| Graduates               | 1         | 1          |
| Profession              |           |            |
| Not Working             | 42        | 42         |
| Entrepreneur            | 14        | 14         |
| Civil Servants          | 5         | 5          |
| Private Employees       | 9         | 9          |
| Others                  | 30        | 30         |
| Religion                |           |            |
| Islamic                 | 11        | 11         |
| Catholic Christian      | 8         | 8          |
| Christian Protestant    | 81        | 81         |
| Income                  |           |            |
| <1,500,000              | 62        | 62         |
| 1,500,000–2,500,000     | 14        | 14         |
| 2,500,000–3,500,000     | 12        | 12         |
| >3,500,000              | 12        | 12         |
| Personal History of Exposure to COVID-19 | | |
| Ever                    | 19        | 19         |
| Never                   | 81        | 81         |
| Family History of Exposure to COVID-19 | | |
| Ever                    | 28        | 28         |
| Never                   | 72        | 72         |
| Personal history of COVID-19 vaccination | | |
| Have been vaccinated    | 76        | 76         |
| Not vaccinated          | 24        | 24         |
| Family history of COVID-19 vaccination | | |
| Have been vaccinated    | 87        | 87         |
| Not vaccinated          | 13        | 13         |
| Willingness for the COVID-19 vaccine | | |
| Yes                     | 97        | 97         |
| No                      | 3         | 3          |

Based on the study, we conducted, it was found that the level of good knowledge was 46%, 50% sufficient, 4% deficient, 99% good attitude, 1% sufficient, and good behavior 82%, 18% sufficient (data were not shown).
The relationship between respondents' characteristics and the level of public knowledge about COVID-19 vaccination is shown in Table 2.

From Table 2, it could be seen that the level of knowledge based on age with good categories had the largest percentage of 37% at the age of 17–25 years, women had better knowledge than men as much as 33% versus 13%. Based on education history, respondents who finished high school had good knowledge of 32%. As many as, 40% of Protestant Christians have good knowledge. It was quite surprising also that respondents who had incomes below 1 million five hundred thousand rupiah had good knowledge as well. While for respondents and families of respondents who had never been exposed to COVID-19 had good knowledge that was 37% and 33% compared to respondents and families who had been exposed to COVID-19. Respondents and families of respondents who had been vaccinated, had good knowledge levels of 43% and 42%. All respondents who were willing to vaccinate COVID-19 also had sufficient knowledge about COVID-19 vaccination which was as much as 49%. Respondents' characteristics of age, gender, religion, income, history of exposure to COVID-19 and willingness to vaccinate COVID-19 and occupation did not have a significant association with knowledge level (p > 0.05) while education level and personal history of COVID-19 vaccination had a significant association with knowledge level (p < 0.05). The respondents' characteristic relationship to knowledge is shown in Table 2:

**Characteristic relationship of respondents with public attitudes about COVID-19 vaccination**

The majority of respondents aged 17–25 years had a good attitude regarding the COVID-19 vaccine by 74%. Women had a better attitude than men, which was 58% versus 41%. Respondents who finished high school had a good attitude rate of 62%. Based on the characteristics of religion, Islam, Catholic Christianity, and Protestant Christianity, all showed good attitudes of each religion's total in responding to the COVID-19 vaccination. Respondents with low to high incomes had a good attitude that was 12–61%. Respondents who did not have a history of exposure to COVID-19 had a good attitude rate of 81%. Likewise, respondents who had been vaccinated COVID-19 had a good attitude rate of 76% similar with the attitude of the families of respondents who had vaccinated COVID-19 which was as much as 86%. Good attitude was shown by respondents who were willing to vaccinate COVID-19 as much as 96%. Of all the respondents' characteristics, namely, age, education, income, vaccination history, and exposure to COVID-19 and employment did not have a significant relationship with attitude (p > 0.05) while religion had a meaningful relationship to attitude (p < 0.05). The respondent's characteristic relationship to attitude is shown in Table 3:

**Respondent characteristic relationship with community behavior about COVID-19 vaccination**

The majority of respondents aged 17–25 years had good behavior regarding the COVID-19 vaccine by 63%. Women had better knowledge than men at 51% versus 49%. Based on education history, respondents who finished high school had good behavior of 50%, followed by respondents who finished bachelor which was 24%. About 68% of Protestant Christians have good behavior. In addition, respondents who had incomes below 1 million five hundred thousand rupiah had good behavior as well. Meanwhile, for respondents and families of respondents who had never been exposed to COVID-19, they had good behavior, which was 66% and 59% compared to respondents and families who had been exposed to COVID-19. Respondents and families of respondents who had been vaccinated had good knowledge levels of 67% and 74%. All respondents who were willing to vaccinate COVID-19 also had sufficient knowledge about COVID-19 vaccination, which was as much as 81%. The characteristics of respondents namely gender, age, education, income, vaccination
The brands of COVID-19 vaccines that can be found in Indonesia are Sinovac, Sinopharm, AstraZeneca.

Respondents strongly agreed that the COVID-19 vaccine should be safe and effective. Respondents agreed that if COVID-19 has been vaccinated, a person must implement health protocols.

Respondents strongly agreed that the COVID-19 vaccine helps protect family, friends, and the public.

Respondents agreed that if they get a COVID-19 vaccine schedule, then they should prepare themselves and go directly to the COVID-19 vaccination location.

Respondents strongly disagreed that it could be free not to use masks again when leaving the house after getting the COVID-19 vaccine.

Respondents did not agree to get and believe information about COVID-19 only from family, close friends and people they trust.

Respondents agreed to provide an explanation of the importance of implementing health protocols for people around those who have been vaccinated against COVID-19.

Respondents agreed to try to find valid information either by going to the health service or reading information from the official government website when getting information on social media that the COVID-19 vaccine can cause paralysis.

Discussion

In this study, there was a relationship between age and knowledge of the COVID-19 vaccine. The same as with previous studies that stated that age affects a person's cognition and mindset. As a person's gets older, they will develop his catch and mindset, so that the knowledge gained is getting better [13]. Significant relationships were also found at the level of education with knowledge, the higher the level of education, the better the level of knowledge. These results are similar with previous research [13]. The existence of a relationship between education and knowledge is in accordance with previous research [13]. The existence of a relationship between education and knowledge is in accordance with the COVID-19 vaccination schedule, then they should prepare themselves and go directly to the COVID-19 vaccination location.

Respondents strongly disagreed that it could be free not to use masks again when leaving the house after getting the COVID-19 vaccine.

Respondents did not agree to get and believe information about COVID-19 only from family, close friends and people they trust.

Respondents agreed to provide an explanation of the importance of implementing health protocols for people around those who have been vaccinated against COVID-19.

Respondents agreed to try to find valid information either by going to the health service or reading information from the official government website when getting information on social media that the COVID-19 vaccine can cause paralysis.

Table 3: Relationship of respondents characteristics with attitudes about COVID-19 vaccination

| Subject Characteristics          | Good n (%) | Sufficient n (%) | p-value |
|---------------------------------|------------|------------------|---------|
| Age group                       |            |                  |         |
| 17-25                           | 74         | 1                | 0.954*  |
| 26-35                           | 9          |                  |         |
| 36-45                           | 7          |                  |         |
| 46-55                           | 9          |                  |         |
| Gender                          |            |                  |         |
| Man                             | 41         | 1                | 0.420*  |
| Woman                           | 58         |                  |         |
| Last education                  | 1          |                  |         |
| No education                    |            |                  |         |
| Junior High School              | 1          |                  |         |
| Senior High School              | 62         | 1                |         |
| Diploma                         | 6          |                  |         |
| Bachelor                        | 28         | 0                |         |
| Graduate                        | 1          |                  |         |
| Profession                      |            |                  |         |
| Not Working                     | 41         | 1                |         |
| Entrepreneur                    | 14         | 0                | 0.847*  |
| Civil Servants                  | 5          |                  |         |
| Private Employees               | 9          |                  |         |
| Others                          | 30         | 0                |         |
| Religion                         |            |                  |         |
| Islamic                         | 10         | 1                | 0.018*  |
| Catholic Christian              | 8          | 0                |         |
| Christian Protestant            | 81         |                  |         |
| Income                          |            |                  |         |
| < 1,500,000                     | 61         | 1                |         |
| 1,500,000–2,500,000             | 14         | 0                | 0.893*  |
| 2,500,000–3,500,000             | 12         |                  |         |
| > 3,500,000                     | 12         |                  |         |
| Personal History of Exposure to COVID-19 | 18 | 1 | 0.190* |
| Ever                            | 81         |                  |         |
| Never                           |            |                  |         |
| Family History of Exposure to COVID-19 | 27 | 1 | 0.280* |
| Ever                            | 72         |                  |         |
| Never                           |            |                  |         |
| Personal History of COVID-19 Vaccination | 76 | 0 | 0.240* |
| Have been vaccinated            | 23         |                  |         |
| Not vaccinated                  |            |                  |         |
| Family History of COVID-19 Vaccination | 86 | 1 | 1.000* |
| Have been vaccinated            | 13         |                  |         |
| Not vaccinated                  |            |                  |         |
| Willingness for the COVID-19 vaccine | Yes | 96 | 1 | 1.000* |
| No                              | 3          | 0                |         |

*(Kruskal Wallis test, *Fisher’s exact test.

Table 4: Distribution of frequency of questions with the number of participants who answered the most correct of questions about COVID-19 vaccination

| No | Question                                                                 | Category | n (%) |
|----|--------------------------------------------------------------------------|----------|-------|
| 1  | People who are most at risk of COVID-19 disease                          | Knowledge| 97    |
| 2  | Currently, the world has developed a vaccine for the prevention of COVID-19 |          | 80    |
| 3  | The purpose of vaccines is to increase immunity to a disease and reduce morbidity |          | 94    |
| 4  | The way vaccines work is by developing immunity by mimicking infections and then producing antibodies |          | 90    |
| 5  | The brands of COVID-19 vaccines that can be found in Indonesia are Sinovac, Sinopharm, AstraZeneca |          | 88    |
| 6  | Respondents strongly agreed that to prevent the spread of the coronavirus, a person must wear a mask, keep their distance, and wash their hands |          | 90    |
| 7  | Respondents strongly agreed that the COVID-19 vaccine should be safe and effective |          | 90    |
| 8  | Respondents agreed that if COVID-19 has been vaccinated, a person must implement health protocols |          | 87    |
| 9  | Respondents agreed that the government requires everyone to be vaccinated for COVID-19 |          | 72    |
| 10 | Respondents strongly agree that the COVID-19 vaccination helps protect family, friends, and the public |          | 84    |
| 11 | Respondents agreed that if they get a COVID-19 vaccination schedule, then they should prepare themselves and go directly to the COVID-19 vaccination location |          | 69    |
| 12 | Respondents strongly disagreed that it could be free not to use masks again when leaving the house after getting the COVID-19 vaccine |          | 56    |
| 13 | Respondents did not agree to get and believe information about COVID-19 only from family, close friends and people they trust |          | 51    |
| 14 | Respondents agreed to provide an explanation of the importance of implementing health protocols for people around those who have been vaccinated against COVID-19 |          | 64    |
| 15 | Respondents agreed to try to find valid information either by going to the health service or reading information from the official government website when getting information on social media that the COVID-19 vaccine can cause paralysis |          | 54    |
the theory that education is to develop one’s personality and ability to understand something [14].

We found no meaningful relationship between work and knowledge level. Previous theories have suggested that work provides experiences that influence knowledge. A person who lives busy outside the home and interacts with many people will have a wider range of knowledge than people who spend more time at home. This situation is because a person has many relationships and has the opportunity to get more information [15]. The absence of a meaningful relationship between work and knowledge suggests that knowledge can be influenced by multifactorial.

There was a significant relationship between the personal history of COVID-19 vaccination and the level of public knowledge with the previous research [13]. These results are in line with the theory that knowledge can be gained from experience. An experience is an event that someone has experienced in the past. In general, the more experience a person has, the more knowledge he or she acquires [14]. The existence of a meaningful relationship between the willingness of vaccination and the level of public knowledge is also same with previous research [16]. This is because good knowledge can affect a person’s factors such as education level, occupation, age, interests, experiences, environmental culture and information [14].

In this study, gender, religion, and income had no association with knowledge. These results do not correspond to the theory that these three factors are closely related to knowledge [17]. The absence of a significant relationship between gender, religion and income is due to knowledge not only gained from the level of education received, but also supported by information received from mass media, newspapers, magazines, the internet, and television. Motivation also affects a person’s knowledge, the presence of curiosity will encourage a person to look for sources of information [18].

Related to community attitudes about the COVID-19 vaccine, there was a significant relationship only between religion and community attitudes in Medan Denai District about COVID-19 vaccination. This is in accordance with the theory explained attitudes can be influenced by educational institutions as well as religious institutions [19]. The characteristics of the other respondents did not have a meaningful relationship to attitudes. There was no relation between age and attitude according to previous studies [20]. The absence of a significant association between sex and attitudes about COVID-19 vaccination is in line with previous research showing that there is no relationship between sex and attitudes toward casual sex [21]. The absence of a significant association between education and attitudes about COVID-19 vaccination was in line with previous research showing that there was no relationship between education and maternal attitudes (p = 1000) about MR vaccination [22]. This was not in accordance with the theory that education is one of the components forming attitudes [23].

The absence of a significant association between willingness in vaccines and attitudes towards COVID-19 vaccination is in line with other studies that found that there was no relationship between attitudes and willingness to accept COVID-19 vaccination in Sungai Raya Village, Sungai Raya District, Kubu Raya Regency [24]. Other characteristics such as employment, income, personal and family history of exposure to COVID-19 also do not have a significant relationship with attitudes towards COVID-19 vaccination in the people of Medan Denai Subdistrict. Many other factors that can affect a person’s attitude, attitude will be influenced by personal experiences, culture, people who are considered important, the media of the period, educational institutions, and emotions. From these factors, there are factors that have a big influence on knowledge, namely personal experience, mass media, and educational institutions. Variable personal and family vaccination histories had no significant association with attitudes to COVID-19 vaccination. This is not in line with the basic theory of attitude formation, personal experience should leave a deep impression, if it has this personal experience, and the attitude will be more malleable and occur in situations involving emotional factors [19]. Attitude formation is influenced by many factors, namely, personal experiences, culture, others that are considered important, mass media, educational/religious institutions, and emotional levels [25].

Our results also found no meaningful association between age characteristics and behavior. This is in line with the previous research that stated that age has no relationship with respondents’ attitudes about preventing COVID-19 transmission [26]. Getting older does not guarantee a person will have a positive attitude; this is because welfare, social support and community participation (the environment) have associations with the emergence of a positive attitude [27]. The absence of a significant association between sex and behavior is in line with previous research [28] while education levels have no meaningful relationship with people’s behavior about COVID-19 vaccination. These results are not in line with research that mentions there is a relationship between education levels and COVID-19 prevention behavior in the people of North Sulawesi with a value (p < 0.01). The level of education also affects one’s knowledge and health knowledge will affect behavior as a medium-term result of health education, then health behavior will affect the increasing indicators of public health as the output of health education [29]. Education influences human behavior and if the acceptance of new behavior is based on knowledge, awareness, positive attitudes then the behavior will be fixed [30].

In this study, there was no significant association between work, a history of exposure to COVID-19 and behaviors about COVID-19 vaccination.
This is in line with other studies showing that people’s perceptions are not related to work and a history of COVID-19 disease [31]. There is no significant association between income and COVID-19 vaccination behavior in the people of Medan Denai Subdistrict. This is not same with other studies that have found a significant link between economic status and cervical cancer vaccination behavior [32]. These differences in outcomes suggest that socioeconomic circumstances influence the process of changing health status because it will affect thinking or beliefs so that it can lead to changes in health behaviors [33].

We found a significant association between the personal history of COVID-19 vaccination and the behavior about COVID-19 vaccination. This is in accordance with the theory that a positive attitude will be followed by behavior that refers to the experiences of others or can also be based on the many or least experiences of a person [34]. It is assumed that more experiences experienced by respondents who have been vaccinated COVID-19 than respondents who have not vaccinated COVID-19, as well as against cultural factors, the influence of others (parents), mass media, education/religion, and emotional levels will affect the level of behavior of respondents to COVID-19 vaccination. The absence of a significant association between willingness in vaccines and behavior about COVID-19 vaccination contrasts with research that shows there is a behavioral relationship with willingness to receive the COVID-19 vaccine in Sungai Raya Village [23]. These differences in outcomes suggest that factors affecting people’s willingness to receive vaccinations are multifactorial such as age, education level, occupation, marital status, religion, and ethnicity [11].

Conclusions

People in Medan Denai Subdistrict, Medan City, Indonesia, had sufficient knowledge levels, good attitudes and good behavior related to the COVID-19 vaccine. The level of education, religion, COVID-19 vaccination history affected people’s knowledge, attitudes, and behavior regarding COVID-19 vaccination. Education from the government, educational institutions and religious leaders about the COVID-19 vaccine is needed to help the success and acceleration of the COVID-19 vaccination program in Indonesia.

References

1. Sifuentes-Rodríguez E, Palacios-Reyes D. COVID-19: The outbreak caused by a new Coronavirus. Bol Med Hosp Infant Mex. 2020;77(2):47-53. https://doi.org/10.24875/BMHIM.20000039
2. Kementerian Kesehatan Republik Indonesia. Kesiapan Kementerian Kesehatan RI Dalam Menghadapi Outbreak Novel Coronavirus. Indonesia: Kementerian Kesehatan Republik Indonesia; 2020. p. 1-26. Available from: https://www.papdi.or.id/pdfs/817/dr siti nadias menkenes ri.pdf. [Last accessed on 2021 Mar 28].
3. Bárcena M, Oostergetel GT, Bartelink W, Faas FG, Verkleij A, Rotter PJ, et al. Cryo-electron tomography of mouse hepatitis virus: Insights into the structure of the Coronavirion. Proc Natl Acad Sci USA. 2009;106(2):582-7. https://doi.org/10.1073/pnas.0805270106 PMid:19124777
4. Persatuan Dokter Paru Indonesia. Diagnosis and Penatalaksanaan COVID di Indonesia. Indonesia: Persatuan Dokter Paru Indonesia; 2020. Available from: https://www.persi.or.id/images/2020/data/buku_pneumonia_covid19.pdf. [Last accessed on 2021 Jun 02].
5. World Health Organization. WHO Coronavirus (COVID-19) Dashboard, WHO Coronavirus (COVID-19). Geneva: World Health Organization; 2021. Available from: https://www.covid19.who.int [Last accessed on 2021 Jun 02].
6. Satuan Tugas Penanganan COVID-19. Analisis Data COVID-19 Indonesia (Update Per 28 Maret 2021)-Berita Terkini; 2021. Available from: https://www.covid19.go.id/pi/berita/analisis-data-covid-19-indonesia-update-29-maret-2021 [Last accessed on 2021 Mar 28].
7. Pemerintah Kota Medan. Angka Kematian di Kec. Medan Denal2021. Available from: https://www.covid19.pemkomedan.go.id/index.php?page=stat_kel&kec=medan%20denai [Last accessed on 2021 Apr 17].
8. Kementerian Kesehatan Republik Indonesia. Vaksinasi COVID-19 Nasional; 2021. Available from: https://www.vaksin.kemkes.go.id/#/vaccines. [Last accessed on 2021 Mar 28].
9. Pemerintah Kota Medan. Zona Merah di Medan; 2021. Available from: https://www.covid19.pemkomedan.go.id/index.php?page=peta [Last accessed on 2021 Apr 17].
10. Kementerian Kesehatan Republik Indonesia. Survei Penerimaan Vaksin COVID-19 di Indonesia, Satuan Gugus Tugas Penanganan COVID-19; 2020.
11. Ichsan DS, Hafid F, Ramadhan K, Determinant of people willingness to accept COVID-19 vaccination in Central Sulawesi. Politekika J Ilmu Kesehatan. 2021;15(1):1.
12. Komite Penanggulangan COVID-19 dan Pemulihan Ekonomi Nasional. Vaksinasi COVID-19 Lindungi Diri, Lindungi Negeri; 2021, p. 22.
13. Nurhasanah F, Pengetahuan, Persepsi, Dan Perilaku Terkait COVID-19 Serta Penerimaan Vaksin COVID-19 Pada Masyarakat Di Kabupaten Bantul, (Doctoral Dissertation, BMHIM.20000039
14. Mubarak IW. Promosi Kesehatan Untuk Kebidanan. Jakarta: Salemba Medika; 2012.
15. Istighfarisma A, Arini SY, Widyantarto A, Lariza B, Sari HR. Relationship between characteristics of breastfeeding mother with exclusive breastfeeding in leran village kalitidu district bojonegoro regency. Media Gizi Kesmas. 2021;10(2):50-7.
16. Febriyanti N, Choliq MI, Mukti AW. Relationship of knowledge level and willingness of COVID-19 vaccination in the residents of dukuh village wongal, Surabaya city. SNHRP. 2021;3:36-42.
17. Purnamasari I, Raharyani AE. The level of knowledge and students about the prevention of COVID-19 in Indonesia. J Ilmu Keperawatan Kebidanan. 2020;11(2):258-64.
Relation of respondent characteristics with behavior regarding COVID-19 vaccination

| Subject characteristics | Good n (%) | Sufficient n (%) | p-value |
|--------------------------|------------|------------------|---------|
| Age group                |            |                  |         |
| 17–25 (late teens)       | 63 (12)    |                  | 0.321a  |
| 26–35 (early adulthood)  | 7 (2)      |                  |         |
| 36–45 (late adulthood)   | 4 (3)      |                  |         |
| 46–55 (early elderly)    | 8 (1)      |                  |         |
| Gender                   |            |                  |         |
| Man                      | 31 (11)    |                  | 0.070d  |
| Woman                    | 51 (7)     |                  |         |
| Last education           |            |                  |         |
| No education             | 0 (1)      |                  | 0.236a  |
| Junior High School       | 1 (0)      |                  |         |
| Senior High School       | 50 (13)    |                  |         |
| Diploma                  | 6 (0)      |                  |         |
| Bachelor                 | 24 (4)     |                  |         |
| Graduate                 | 1 (0)      |                  |         |
| Profession               |            |                  |         |
| Not Working              | 31 (11)    |                  | 0.324a  |
| Entrepreneur             | 11 (3)     |                  |         |
| Civil Servants           | 5 (0)      |                  |         |
| Private Employees        | 8 (1)      |                  |         |
| Others                   | 27 (3)     |                  |         |
| Religion                 |            |                  |         |
| Islamic                  | 7 (4)      |                  | 0.240a  |
| Catholic Christian       | 7 (1)      |                  |         |
| Christian Protestant     | 68 (13)    |                  |         |
| Income                   |            |                  |         |
| < 1,500,000              | 51 (11)    |                  | 0.427d  |
| 1,500,000–2,500,000      | 12 (2)     |                  |         |
| 2,500,000–3,500,000      | 8 (4)      |                  |         |
| > 3,500,000              | 11 (1)     |                  |         |
| Personal History of Exposure to COVID-19 |            |                  |         |
| Ever                     | 16 (3)     |                  | 1.000p  |
| Never                    | 66 (15)    |                  |         |
| Family History of Exposure to COVID-19 |            |                  |         |
| Ever                     | 23 (5)     |                  | 0.981d  |
| Never                    | 59 (13)    |                  |         |
| Personal History of COVID-19 Vaccination |            |                  |         |
| Have been vaccinated     | 67 (9)     |                  | 0.012d  |
| Not vaccinated           | 15 (9)     |                  |         |
| Family History of COVID-19 Vaccination |            |                  |         |
| Have been vaccinated     | 74 (13)    |                  | 0.056b  |
| Not vaccinated           | 8 (5)      |                  |         |
| Willingness for the COVID-19 vaccine |            |                  |         |
| Yes                      | 81 (16)    |                  | 0.083b  |
| No                       | 1 (2)      |                  |         |

Kruskal-Wallis test, Fisher’s exact test, Chi-square test.