> **Original Article**

Ethical Issues in Global Pandemic Covid-19: Attitudes and Perceptions of the People of Bandung City Toward Contact Tracing and the Confidentiality Issues it Can Raise

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ABSTRACT

The COVID-19 pandemic has created an innovative space for technology to become a solution, which, if implemented effectively, can help reduce the negative impact of the pandemic on society. For example, contact tracing, which if done manually, requires more resources and takes a lot of time, even though the spread of COVID-19 is happening very quickly, so a faster task force response is also needed. This research aims to determine public perceptions of confidentiality issues that may arise from implementing COVID-19 contact tracing, as well as public attitudes towards implementing COVID-19 contact tracing. This research will use a quantitative study method using a cross-sectional method. The researchers used a phenomenological theoretical approach to find out how people view contact tracing. The results of this research show that the majority of people in Bandung City who were respondents to this research have a positive attitude towards contact tracing and support the implementation of contact tracing. Most of the people in Bandung City who were respondents to this research had a good perception of contact tracing and felt that their privacy would not be disturbed by contact tracing. So the government needs to ensure that the public can easily access the contact tracing method used. Health officials need to explain contact tracing in a way that is easy for the public to understand so that the public understands the purpose of implementing contact tracing. And the public should also seek the latest information about health and obey the recommendations of the government and health officials.

Keywords: COVID-19, Contact Tracing, Confidentiality

INTRODUCTION

At the end of December 2019, a pathogen was discovered that is a new type of Coronavirus variant, which was later named Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2)[1,2]. This pathogen causes a severe respiratory syndrome defined as Coronavirus Disease (COVID-19)[3]. As of March 11, 2020, COVID-19 cases spread rapidly to 114 countries with the number of cases exceeding 118,000 and causing more than 4,000 deaths. Due to the high severity, rapid spread, and slow response to this phenomenon, WHO declared COVID-19 a global pandemic. WHO hopes that with this declaration every country can increase responsiveness and accelerate strategies to deal with COVID-19. As

of March 11, 2020, COVID-19 cases spread rapidly to 114 countries with the number of cases exceeding 118,000 and causing more than 4,000 deaths. Due to the high severity, rapid spread, and slow response to this phenomenon, WHO declared COVID-19 a global pandemic. WHO hopes that with this declaration, every country can increase responsiveness and accelerate strategies to deal with COVID-19 [4-7]. Cases increased so fast that the Ministry of Health issued various policies, from Large-Scale Social Restrictions (PSBB) which was later changed to a new form of policy, namely the Regulation of Restrictions on Community Activities or PPKM, to conveying the principles of 3M, 3T, and Vaccination to control the transmission of COVID-19[8–10]. This concept includes the 3M health behaviors of wearing,

distancing and avoiding crowds, and washing hands with soap; accompanied by the 3Ts of testing, tracing, and follow-up; and in line with vaccination dissemination efforts[10,11].

One of the main strategies to break the chain of spread and reduce mortality from COVID-19 is contact tracing accompanied by thorough testing, isolation and case management[5]. Contact tracing has been an important pillar in controlling infectious diseases for many years, such as in the handling of SARS in 2003 and Ebola in 2013 [6]. Although a COVID-19 vaccine has been found, identifying the source of the disease through case tracking is still very important to detect hidden chains of transmission so that it can be more effective in controlling the spread of the SARS-CoV-2 virus[5].

Pandemi COVID-19 menciptakan ruang inovasi bagi teknologi untuk menjadi solusi, dimana jika diterapkan secara efektif dapat membantu mengurangi dampak buruk pandemi terhadap masyarakat[12]. For example in contact tracing, which if done manually requires more resources and takes a lot of time, even though the spread of COVID-19 occurs very quickly so that a more swift task force response is also needed[6].

Various technologies including GPS, Bluetooth and WIFI are used to estimate the distance and duration of interactions between individuals. The technologies used have their own advantages, such as Bluetooth which requires less cost and energy usage, and GPS which can record the location of each individual[13]. Then there are also other technologies used such as WiFi, RFID and NFC[14].

Indonesia itself has a Sijejak feature in the pedulilindungi application as a GPS and Bluetooth-based digital contact tracking tool to alert users if they enter high-risk areas, track contacts, and record travel history. The app utilizes a signal exchange whose data is stored on the user's device for 14 days anonymously. The system will ask for consent to share the stored data with the detected close contacts if the user is identified as a confirmed case of COVID-19[15].

However, each technology used will have its own risks. On the one hand, contact tracing is important because it can limit transmission and reduce mortality[5]. But on the other hand, a certain amount of patients' personal information will be used, while the

technology is still vulnerable to attacks, piracy, and other risks. Authorities are obliged to minimize these risks as much as possible to maintain the confidentiality of the stored data because it can have a negative impact on users, even to the point of affecting public health[16]. Then the technology used can also raise issues of equality where not everyone has access to the devices needed to run the technology used, and not everyone has the ability to understand the instructions in running the technology[16].

Public concerns regarding contact tracing can be seen through several studies, including a cross-sectional study conducted in Jordan involving 2000 respondents. According to the study, the main concerns in the use of technology in contact tracing are the confidentiality of information (88.6%) and the use of information collected through applications (82.5%)[17]. While a study in the United States showed that out of 1,964 respondents, only 42% supported and used contact tracing apps[18]. In the European region, the acceptance rate in Germany and Switzerland is as high as 70%, but only 25%-31% of the total population downloads contact tracing apps[19].

The reasons for these differing levels of acceptance range from concerns about discrimination, privacy violations, to doubts about the security of data storage[20]. Another factor that caused unrest in the implementation of contact tracing was the community's hesitation towards the local government in terms of data protection[21]. There is also the fear of stigma leading to discrimination against the identified individual[22].

Regarding the aspect of personal data protection, in the Pedulilindungi application, users are given an explanation of how the application works, the terms of use, and the privacy policy where user data is guaranteed security. However, there is no explanation of which parties are responsible and have the right to process the data stored in the application[23].

Another app that uses GPS and Bluetooth technology is the Aarogya Setu App released by the Government of India. The Indian government was criticized for being less transparent, but later decided to be more open about the application system they use. Malaysia also utilizes Bluetooth technology in its MyTrace app, but not much information can be obtained about user data processing[24]. In fact, according to WHO recommendations, users should be able to get clear information about

data collection, storage, and processing in the application so that the workings of the system used can be better understood[25].

Seeing the many concerns that can arise in the community and the issues that arise in contact tracing, the researcher is interested in examining the attitudes and perceptions of the people of Bandung City regarding contact tracing and the confidentiality issues it can cause. The researcher used a phenomenological theory approach to find out how people perceive contact tracing. Phenomenological theory itself is a way of thinking to find out how a phenomenon can occur in everyday life[26].

Bandung was chosen as the research location because it is the capital city of West Java, which means that the social life in this city is very dynamic and it can be said that Bandung reflects the axis of life in West Java. The results of this study are expected to be useful to illustrate for clinicians to be more careful when dealing with patients' personal information and provide understanding to the community regarding the importance of contact tracing so that better communication between clinicians and the community can increase trust in health workers. The purpose of this study was to determine community perceptions of confidentiality issues that can arise from the implementation of COVID-19 contact tracing, as well as community attitudes towards the implementation of COVID-19 contact tracing.

METHOD

This research is part of the Ethical Issue in Global Pandemic COVID-19 research series, specifically on the topic of Ethical Issues in Confidentiality. This research will use a quantitative study method using a cross-sectional method. The quantitative research method is a systematic and methodical scientific strategy that seeks to gather evidence that can be quantified and expressed in numerical form. The primary objective of this methodology is to examine the association between variables and assess hypotheses through the application of statistical techniques. The data to be used is primary data obtained from questionnaires that will be distributed online to the people of Bandung City. At the end of this research, data will be obtained regarding the Attitudes and Perceptions of the People of Bandung City towards Contact Tracing and the Confidentiality Issues that it can cause.

The target population in this study is the people of Bandung City who have a permanent and non-permanent domicile with an age of more than equal to 18 years. To determine the sample in this study, inclusion and exclusion criteria were used. The inclusion criteria consisted of people who live permanently and temporarily in Bandung City, people aged more than equal to 18 years, people who use cellular phones, and are willing to become research respondents. While the exclusion criteria consist of students in the field of health, students in the field of information technology, and health workers. This research will use convenience sampling technique. Convenience sampling is a type of non-random or non-probability sampling where each member in the population does not have the same opportunity to participate in the study. In convenience sampling, the target population meets certain criteria such as ease of access, geographical proximity, time availability, and availability to become respondents in the study[27]. Samples taken can sometimes also be used based on spontaneity factors so that convenience sampling can also be referred to as accidental sampling[28].
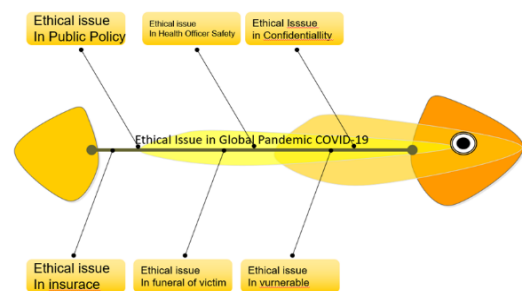

Figure 1. Research Framework

RESULTS

Validity Test Results

The validity test of this questionnaire involved 15 questions that were tested on 30 respondents. The data obtained is then processed using the IBM SPSS version 26 application. The question will be concluded valid if the rCount value is greater than the rTable value and declared invalid if the rCount value is smaller than the rTable value, with an rTable value of 0.361.

In the first validity test, there were 3 question items that were declared invalid, namely questions number 4, 5, and 12 because

they had an rcount value of 0.168; 0.059; and 0.193 respectively.

Table 1. Validity Test Results 1

Question Number	Value of r-Count	Value r-Table	Result
1	0,510	0,3494	VALID
2	0,504	0,3494	VALID
3	0,366	0,3494	VALID
4	0,168	0,3494	INVALID
5	0,059	0,3494	INVALID
6	0,540	0,3494	VALID
7	0,464	0,3494	VALID
8	0,359	0,3494	VALID
9	0,478	0,3494	VALID
10	0,593	0,3494	VALID
11	0,686	0,3494	VALID
12	0,193	0,3494	INVALID
13	0,401	0,3494	VALID
14	0,717	0,3494	VALID
15	0,404	0,3494	VALID

Based on the results obtained, changes were made to questions that had not been declared valid. The changes made are as follows:

Before	After
I am willing to share the following information with health workers if asked: Names of people encountered or had a history of physical contact during the given period Location data from mobile phones	1. I am willing to share the following information with health workers if asked: i. Names of people who have been met over a period of time ii. Information on locations visited during a certain period of time, detected through a mobile phone
I prioritize personal freedom over the public interest	2. I Prioritize the public interest over personal freedom

Reliability Test Results

The reliability test was carried out using the IBM SPSS application. The results of this reliability test show that the Cronbach's Alpha value obtained is 0.696. This value is greater than 0.60, which means it can be concluded that the questionnaire is reliable.

Table 2. Reliability Test Results

Reliability Statistics	
Cronbach's Alpha	N of Items
.696	16

Description of Research Subjects

The following is a description of the number and percentage of research subjects based on age, gender, occupation, latest education, and monthly income.

Table 3. Description of Research Subjects

Variable	Frequency	Percentage
Age [29]		
1. 18 – 24 y.o	106	26.5%
2. 25 – 34 y.o	54	13.5%
3. 35 – 44 y.o	62	15.5%
4. 45 – 54 y.o	136	34%
5. 55 – 64 y.o	33	8.3%
6. 65 – 75 y.o	7	1.8%
7. ≥ 75 y.o	2	0.5%
Gender		
1. Male	213	53.3%
2. Female	187	46.8%
Profession [30]		
1. Not yet/ not working	11	2.8%
2. Housekeeping	30	7.5%
3. Student	77	19.3%
4. PNS	2	0.5%
5. TNI/Polri	0	0%
6. Retired	12	3%
7. Private Employee	26	6.5%
8. State-Owned Enterprises (SOEs)/Government-Owned Enterprises (SOEs) Employees	189	47.3%
9. Self-employed	13	3.3%
10. Teacher/Lecturer	23	5.8%
11. Others	17	4.3%
Education [31]		
1. Not in school	0	0%
2. Did not finish elementary school	0	0%
3. Elementary school	1	0.3%
4. Junior High School	10	2.5%
5. Senior High School	149	37.3%
6. Vocational High School	37	9.3%
7. D1/D2	7	1.8%
8. Academy/D3	25	6.3%
9. D4/S1	145	36.3%

10.	S2	25	6.3%
11.	S3	1	0.3%
	Income per Month(32)		
1.	≤ Rp1.500.000	79	19.8%
2.	Rp1.500.001 – Rp2.500.000	44	11%
3.	Rp2.500.001 – Rp3.500.000	42	10.5%
4.	≥ Rp3.500.001	235	58.8%

Table 4. Description of research subjects on factors related to contact tracing

	Questions	Yes	No
1.	Have you previously heard the term "contact tracing"?	228	172
2.	Do you know the meaning of "contact tracing"?	166	234
3.	Have you had a contact tracing interview?	39	361
4.	Do you know the contact tracing procedure?	47	353
5.	Are you aware of the Pedulilindungi app (now SATUSEHAT)	323	77
6.	Do you know the function of the Pedulilindungi app (now SATUSEHAT)?	279	121
7.	Are you aware of the Sijejak feature in the Pedulilindungi app (now SATUSEHAT)?	86	314
8.	Do you know the function of the Sijejak feature on the Pedulilindungi app (now SATUSEHAT)?	74	326

Table 5. Respondents' Attitude towards Contact Tracers

No.	Questions	STS	TS	S	SS
1.	I am willing to talk if any health worker contacts me regarding COVID-19[33].	20	22	229	129
2.	I am willing to report myself to health duty if confirmed positive for COVID-19[34,35].	15	14	236	135
3.	I am willing to share the following information with health workers if asked:[33,36]	7	30	275	88
i.	History of places visited during a certain period	8	47	259	86
	certain period	9	43	259	89

No.	Questions	STS	TS	S	SS
ii.	Names of people encountered or had a history of physical contact during the given period				
iii.	Information about the locations visited over a period of time, detected through the mobile phone				
4.	I will undergo centralized isolation (in the health facility provided) according to the time determined by health workers if exposed to COVID-19.	21	40	227	112
5.	I will undergo self-isolation according to the time determined by health workers if exposed to COVID-19.	5	15	212	168
6.	I fully support the implementation of contact tracing[18].	13	35	219	133

Table 6. Respondents' Perception of Contact Tracing

No.	Questions	STS	TS	S	SS
Privacy Issues					
1.	I felt that my privacy would not be compromised by contact tracing.	24	63	242	71
2.	I feel that I have received sufficient information regarding the management of users' personal data, both in terms of digital contact tracing (pedulilidungi	16	68	239	77

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No.	Questions	STS	TS	S	SS
	app) and manually.				
Technology issues					
3.	I believe that the data collected in the Pedulilindungi app (now SATUSEHAT) is stored securely.	21	83	218	78
Accessibility Issues					
4.	I found the Pedulilindungi app (now SATUSEHAT) easy to access and use.	10	40	267	83
Cultural Issues					
5.	I prioritize the public interest over personal freedom.	6	23	258	113
Legal Issues					
6.	I believe that there are laws that will protect me in the event of a personal data leak.	15	36	235	114
Volunteerism Issue					
7.	I have no objection to participate in using the Pedulilindungi app (now SATUSEHAT).	6	24	251	119

DISCUSSION

After the questionnaire was distributed, a sample of 400 people was obtained, consisting of 213 male respondents and 187 female respondents. Respondents were dominated by the age group 45-54 years, namely 136 respondents (34%).

Respondents were dominated by the final education level of high school / high school with 149 people (37.3%), followed by the D4 / S1 education level with 145 people (36.3%).

Then from the aspect of income, most respondents, as many as 235 people (58.8%), have an income of more than or equal to Rp3,500,000.00 per month.

In terms of professional background, the majority of the respondents are employees of state-owned enterprises (BUMN/BUMD), as many as 189 respondents (47.3%). Others were students (19.3%), housekeepers (7.5%), private employees (6.5%), teachers/lecturers (5.8%), self-employed (3.3%), retired (3%), not yet working (2.8%), civil servants (0.5%), and others (4.3%).

Regarding contact tracing, most respondents (57%) had heard of the term "contact tracing", but 234 respondents (58.5%) did not know the meaning of the term.

Only 39 respondents (9.8%) had undergone a contact tracing interview, while 361 had not (90.3%). It can also be seen that most respondents (88.3%) did not know the contact tracing procedure.

In contrast to the knowledge of the Pedulilindungi application, 323 people (80.3%) were aware of the application and 279 people (69.8%) knew the function of the application.

However, regarding the Sijejak feature in the Pedulilindungi application, only a few people were aware of the feature (21.5%) and only a few also knew the function of the Sijejak feature (18.5%).

A total of 229 respondents (57.3) agreed and 129 respondents (32.2%) strongly agreed that they would talk if a health worker contacted them regarding COVID-19. Statements related to the willingness to report themselves to health workers if confirmed positive for COVID-19 were also dominated by answers of agree (58%) and strongly agree (33.8%).

Furthermore, regarding the willingness to share information, there are three aspects asked, namely:
1. History of places visited during a certain period
2. Names of people who have been met during a certain period of time
3. Information on the location visited during a certain period of time, which is detected through a mobile phone 4.

Respondents' answers were still dominated by agreeing and strongly agreeing, but there were disagreeing answers of 30, 47, and 43 responses respectively, as well as strongly disagreeing answers of 7, 8, and 9 responses.

The statement regarding undergoing centralized isolation was the one that was answered the most with disagree and strongly

disagree. There were 40 people (10%) who answered disagree and 21 people (5.3%) who answered strongly disagree.

Meanwhile, the statement regarding independent isolation received a more positive response, where the answers to disagree and strongly disagree were only below 5% each. A total of 15 people (3.8%) answered disagree and 5 people (1.3%) answered strongly disagree.

More than half of all respondents, 219 people (54.8%) agreed that they fully support the implementation of contact tracing, 133 others strongly agreed. Meanwhile, 35 people disagreed, and 13 people strongly disagreed.

Respondents' perceptions of contact tracing are still dominated by positive responses from the community when you see that most people answered agree and strongly agree to the statements given. However, the number of people who answered disagree and strongly disagree was slightly higher than the statements regarding attitudes towards contact tracing, as in the data presented in the table below:

A total of 60.5% of respondents (242 people) answered agree regarding the statement that respondents felt that their privacy would not be disturbed by contact tracking. However, 15.8% (63 people) disagreed and 6% (24 people) strongly disagreed.

The same thing happened in the following statement which still touched on the issue of privacy, there were 238 respondents (59.8%) who answered in the affirmative. While those who answered disagree were 68 people (17%) and those who answered strongly disagree were 16 people (4%).

Of the total 400 respondents, regarding the issue of storing data in the application, disagreeing and strongly disagreeing statements received slightly more responses, namely 26.1% combined. 83 people disagreed, and 21 people strongly disagreed that they felt safe regarding the data collected in the Pedulilindungi application.

Respondents who agreed and strongly agreed with the next statement were more numerous than the previous statement, namely 66.8% and 20.8% or in numbers, namely 267 and 83 people. This statement is related to respondents who feel that the Pedulilindungi application is easy to access and use.

Then in this last statement, 258 respondents (64.5%) agreed that they would prioritize the public interest over personal freedom. Another 113 (28.2%) strongly agreed,

while 23 people (5.8) disagreed and 6 people (1.5%) strongly disagreed with the statement.

The majority of participants had a favourable disposition towards contact tracing. The significance of this measure in interrupting the transmission of COVID-19 and safeguarding the entirety of society was duly acknowledged. While a portion of the participants expressed their endorsement of contact tracking, a considerable number of respondents also raised apprehensions regarding the potential infringement on their privacy. The individual expressed a desire to guarantee the secure processing and storage of their personal data.

The respondents expressed a positive reception towards efforts aimed at augmenting public education and raising awareness regarding the advantages associated with contact tracing. It is widely held that enhanced access to accurate and comprehensive information can effectively mitigate privacy-related apprehensions. It is anticipated that the government and health authorities will exhibit transparency in the administration of the contact tracking programme. There was a desire among the general public to actively participate in the decision-making process pertaining to this particular policy.

CONCLUSION

The majority of people in Bandung City who are respondents in this study have a positive attitude towards contact tracing and support the implementation of contact tracing. Most of the people in Bandung City who were respondents in this study had a good perception of contact tracing and felt that their privacy would not be disturbed by contact tracing. Therefore, there are several suggestions given, such as that the government increase efforts to socialise the function and importance of contact tracing during an infectious disease pandemic so that people understand the urgency of contact tracing. Then the government needs to ensure that the contact-tracing method used can be easily accessed by the public. Health workers need to explain in a way that is easy for the community to understand about contact tracing so that the community understands the purpose of implementing contact tracing. And also, the community should seek the latest information about health and obey the recommendations of the government and health workers. So that

further research examines the extent to which the level of education and public awareness about COVID-19 and contact tracing affects public attitudes and participation in the contact tracing programme, as well as identifying factors that affect the level of public trust and distrust of health authorities.

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