

# Needs Assessment for Online Health Education on Diabetes during Covid-19 Pandemic

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**Abstract:** Indonesia is in the 6<sup>th</sup> rank for the highest number of people with diabetes in the world. In fact, diabetes is one of the most common predictors of morbidity in Covid-19 patients. The current condition of Covid-19 pandemic hampers the management of diabetes because of limited patient access to health services. One of the efforts needed for diabetes management is health education. This study aims to obtain information about the readiness of community to take advantage of online education and online educational media which are needed during Covid-19 pandemic. It utilized mix method including quantitative and qualitative methods. Data were collected using a questionnaire distributed via google form to 140 community in-depth interviews with a leader of public health center. The community also need online education in videos and pictures accompanied by online discussion forums with doctors. the strongly agree and agree percentage is required, the online educational media that mostly used by the community was WhatsApp. Health workers also needed online educational media during Covid-19 pandemic.

**Keywords:** Health Education, Online Education, Diabetes, Covid-19, Needs Assesment

Diabetes, globally, is one of the four priority diseases that are not contagious, but can cause blindness, stroke, heart attack, kidney failure and leg amputation in 2015 in [1]. The number of people with diabetes has increased substantially fourfold between 1980 and 2014; from 108 million to 422 million. In fact, Indonesia is in the 6<sup>th</sup> rank as a country with the most diabetes sufferers in the world, with 10.3 million sufferers [2]. Fortunately, diabetes can be controlled and patients with diabetes have the opportunity to live a healthy life and have a long life. Diabetes can be prevented and delayed by maximizing diabetes treatment management. Health education is an initial effort that needs to be done in preventing diabetes and its complications. Health education facilitates increased public knowledge to be better in disease prevention, adherence to treatment, participation and health decision making, increased social support and sharing support with others and independently spread positive experiences about healthier behavior change, disease side effects and forms body changes and the positive impact of adopting a healthy lifestyle [3]–[8].

Furthermore, health education currently being developed by the Ministry of Health is the use of online information technology. Empirical evidence finds it interesting to use online media as an intervention in improving diabetes mellitus education in people with diabetes and in the community via web, as found in a study conducted by Briana B et al., in 2016. Another application such as Facebook, was also used in studies by Yan Zhang (2013); Jeremy (2010); Alqarni Z (2016) [9]–[13]. Moreover, Ekadinata et al., (2017) utilized WhatsApp as an online education media [14]. Online Forum Message was also used as an online educational media in a study by Chen (2020) [15]. In line with smartphones which were involved in an online education media by Andriyanto and Hidayati (2018) [16], [17]. Besides social media applications, telephone communication media are also used in a study by Dunbar (2010). Accordingly, online education is now a forum for health promotion activities by health workers, as found in a study by Gabarron (2018). Online education can be used and utilized anywhere, anytime and by anyone so that it is effective in reaching the wider community [18]–[20]

The use of internet and smartphone technology has long been researched and proven to be effective in improving public health status. Internet accessibility makes it easy for people to search for specific information and learning. This search for information is dominated by the use of the internet via smartphone. Thus, this trend is an opportunity for health practitioners to provide health education through social media [16], [21]. Especially during Covid-19 pandemic, which hampered activities in health facilities, including public access to health services. In this case, people need to adhere to health protocols, avoiding crowd-causing activities.

Quoted from the official website of the Covid-19 handling task force, as of January 5, 2021, the total number of COVID-19 cases in Indonesia amounted to 779,548. There are 645,746 patients recovered, 23,109 deaths, and 110,693 active cases [22]. Besides, data quoted from the official website of Riau province show that as of January 6, 2021, there are 24,932 confirmed cases, of which 583 patients died and 23,083 patients recovered.

In Pekanbaru City, there are 11,691 confirmed cases and 269 patients died [23]. Diabetes is one of the most common predictors of morbidity in Covid-19 patients [24].

Referring to the aforementioned cases, the online health community provides more scalable access to open communication that can be seen by anyone entering the website or app. It has been applied to a variety of conditions and indications, including peer support, sharing of treatment strategies and health advice related to their condition [25], [26]. In a study conducted by Avdal E et al., in 2011, it was found that the attendance rate of community who are monitored online is better than community who come directly to health facilities. Therefore, periodic monitoring that is monitored will achieve the target glycemic index and may avoid complications [27]. Based on previous research, health education using alternative media such as digital health, which can be in the form of web, applications and other features, can be very beneficial during Covid-19 pandemic. The public and health workers are required to follow health protocols in breaking the chain of transmission. Accordingly, online media has become an opportunity as the front guard in facilitating health practitioners to provide health services, especially providing information to the public.

## 2. Research method

This study was conducted in Pekanbaru City as a contributor to the highest prevalence of diabetes mellitus in Riau Province; Riau Province is ranked 4<sup>th</sup> as a province with the highest prevalence of diabetes in Indonesia. It utilized mix method which was divided into two stages. The first stage used quantitative method by distributing questionnaires to find out people's needs for online diabetes health education and to find out what kind of internet and online facilities which were frequently used. The questionnaire was distributed using google form to community with diabetes who used Android and were connected to WhatsApp (WA). From 240 WA contact numbers recorded in six public health centers, in a span of one month, there were only 140 respondents filling in the google form. Importantly, the second stage used qualitative method by conducting in-depth interview with one leader of public health center and 4 community with diabetes to confirm information about the implementation of diabetes prevention and control programs during Covid-19 pandemic. Data collection was carried out by telephone interviews and video calls due to Covid-19 pandemic conditions which made it impossible for direct interviews. The data obtained from the quantitative method were analyzed descriptively and analytically, while the data from the qualitative method were analyzed by means of the content analysis which was sourced from the results of the informants' interpretation.

## 3. Review Of Related Studies

### 3.1 Community needs for online health education on diabetes

The variable-frequency distribution of the results of the online-based health education model needs analysis can be seen in the following table:

Table 1. Needs Analysis for Online-Based Health Education Model

No	Statement	5		4		3		2		1		Total	%
		f	%	f	%	f	%	f	%	f	%		
1	I need health education / counseling provided online / internet	64	45.71	73	52.14	2	1.43	1	0.71	0	0	620	<b>88.57</b>
2	I want to use a smartphone / android to get health information	57	40.71	81	57.86	1	0.71	1	0.71	0	0	614	<b>87.71</b>
3	Health education / counseling using the internet can enrich my understanding of health problems	57	40.71	80	57.14	1	0.71	2	1.43	0	0	612	<b>87.43</b>
4	Obtaining health information via the internet can save time	60	42.86	76	54.29	3	2.14	1	0.71	0	0	615	<b>87.86</b>
5	Obtaining health information via the internet can save energy	60	42.86	76	54.29	3	2.14	1	0.71	0	0	615	<b>87.86</b>
6	Obtaining health information via the internet can save costs	51	36.43	73	52.14	12	8.57	3	2.14	0	0	589	<b>84.14</b>

7	I need health education / counseling materials via the internet that are easily accessible	45	32.14	91	65.00	3	2.14	1	0.71	0	0	600	<b>85.71</b>
8	I need health education materials that include detailed / real videos	53	37.86	78	55.71	7	5.00	2	1.43	0	0	602	<b>86.00</b>
9	I need health education that includes pictures	55	39.29	80	57.14	5	3.57	0	0.00	0	0	610	<b>87.14</b>
10	I feel that the availability of health information on the internet will support activities in health facilities	51	36.43	87	62.14	1	0.71	1	0.71	0	0	608	<b>86.86</b>
11	I need a discussion forum with doctors via the internet to make it easier for me to have consultations	56	40.00	79	56.43	3	2.14	2	1.43	0	0	609	<b>87.00</b>
12	I agree to follow online / internet health education	45	32.14	89	63.57	3	2.14	3	2.14	0	0	596	<b>85.14</b>

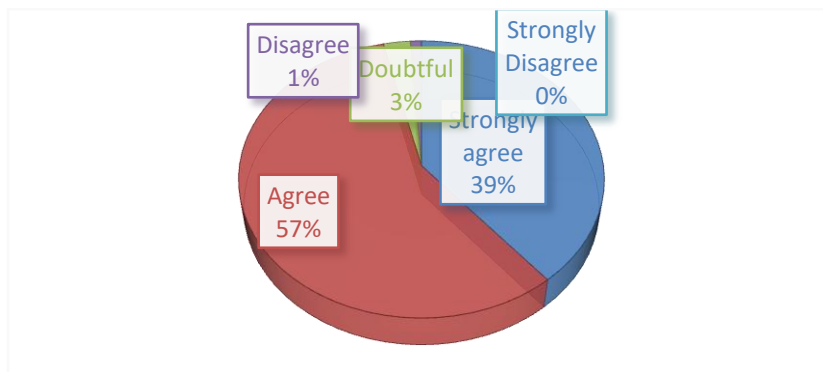
The results showed that 45.71% of respondents strongly agreed, and 52.14% of them agreed to be given online health education. Additionally, 40.71% of respondents strongly agreed, and 57.86% agreed to use smartphones, while 40.71% strongly agreed, and 57.14% agreed, that online education can increase their knowledge. This is in line with Adams' research that online media users can increase the number of interactions to receive more available information, shared, and adjusted so that they can enrich their knowledge [28], [29]. There were also 42.86% of respondents who strongly agreed, and 54.29% who agreed that online education can save time. Furthermore, 42.86% of respondents strongly agreed, and 54.29% agreed that online education can save energy, while 36.43% of respondents strongly agreed, and 52.14% agree that they can save costs. This is in line with Signorini who affirmed that in the public health survey, social media can provide communication at the desired time and is relatively cheap in terms of cost [30].

Based on the research results, it was found that 32.14% of respondents strongly agreed and 65% of them agreed that online health education provides easily accessible information, which is in line with a nation purposed by Adams that online media can expand access to those who may not easily access health information through traditional methods, such as youth, ethnic groups, and lower socio-economic groups. In addition, there were 37.86% of respondents strongly agreed, and 55.71% agreed to display information in the form of videos, while 39.29% of respondents strongly agreed, and 57.14% agreed to include material in the form of images. This is in line with Adams who claimed that social media as the information that is followed could provide in a way that is more than just text and can provide health information to participants with special needs, such as videos and images that can replace the role of text and are also very useful for those who are illiterate [31].

More importantly, there were 36.43% of respondents who strongly agreed, and 62.14% agreed that online education can help health facilities' role. This study is in line with Chew saying that online media can monitor people's reactions to health issues [32]. Another research had been done by Leonita showing that health professionals need to design health promotion models based on social media by integrating social media with health promotion strategies and health communication strategies [33]. Signorini's research stated that online media could also track and monitor disease outbreaks [30]. Besides, research by Scanfeld suggests that it can also identify gaps in information and health information [34].

In this study, it was also found that 40.00% of respondents strongly agreed, and 56.45% of them agreed with the discussion forum facilities with doctors on online educational media. This finding is also in line with Busslet's research that various online media platforms can facilitate communication dialogue between community and community and community with health professionals. It is also in accordance with Wick's research that, online media platforms allow community to engage with each other in sharing health information, advice treatment, and medication [35]. In addition, 32.14% of respondents strongly agreed, and 63.57% agreed to take online health education.

The total number of statements regarding this needs analysis is 12 items. The overall results of the analysis of health education needs can be displayed in the form of a pie chart as follows:



**Figure 1. Pie Chart of Online Based Health Education Model Needs Analysis**

Therefore, referring to the percentage of respondents who strongly agree and which have a dominant value, it can be said that online-based health education model is very much needed. Covid-19 pandemic has brought many changes to the order of life, including the health sector. It is known that health facilities are the source that can spread this virus. Consequently, community's visits to health facilities become very limited. Based on the data above, people have very high expectations for online health education. This is in line with the qualitative study conducted by interviewing the public health center leaders who stated: "During the pandemic, screening and services are still carried out even though the number of visits has decreased from the usual day". Meanwhile, for diabetes case management, he stated: "management of DM is still carried out once a month during this pandemic to prevent community from having contact with community who have a history of other diseases". "the implementation of DM control counseling is not running. We also do not use any methods or media due to limited services during the Covid-19 pandemic." Based on the data above, it can be seen that health services in curative efforts still run properly even with limitations. It was different from promotive and preventive services such as health education which did not work at all. "We hope that health education and promotion activities in the public health center can continue through online media as is being used by several other institutions during this pandemic".

The information conveyed by the leader of public health center is in line with the solution presented by Jenning that health practitioners can use technology for activities to obtain information about patient health and health promotion activities including using smartphones and websites [16], [36]. Qualitative study conducted on community with diabetes also found the same statement: "During Covid-19 pandemic, there are no more counseling activities. The public health center also no longer holds health education activities due to this pandemic. We hope that there will be a solution from the public health center so that we can stay informed about our disease". Covid-19 crisis has led to the rapid transformation of service delivery using telehealth technology, demonstrating that this technology has reached the maturity level required for use in healthcare systems at speed and at scale. It is conceivable that digital consulting will remain the norm even when this pandemic ends [37]. This information illustrates that online facility is one of the media that can be used by health workers and the community in making interactions as an attempt to increase public understanding of the management of their disease. Many countries have adopted digital-first strategy, remote monitoring, and telehealth platform to enable the provision of healthcare services without physical interaction. In England, primary care has embraced telehealth on a large scale and deployed a new digital first line as a route for managing maintenance streaming to the appropriate place [38]. Thus, telehealth can be developed widely and evenly in Indonesia.

**3.2 Readiness of community to take advantage of online education during Covid-19 pandemic**

The potential for the use of online health education for community with diabetes can be seen from the length of interaction between community using the internet, places to access the internet, and media facilities used to find health information. It can be seen in the following table:

Table 2. Needs analysis in terms of Internet Use

No	Internet Use	< 1 year		1 – 2 years		3 – 4 years		5 – 6 years		> 6 years	
1	I have used the internet for a long time	f	%	F	%	f	%	f	%	f	%
		15	10.71	24	17.14	24	17.14	15	10.71	61	43.57

2	I browse the internet the most at	Home		Office / campus		Café		Wherever (mobile / handphone)		Others		
		f	%	F	%	f	%	f	%	f	%	
		76	54.29	4	2.86	2	1.43	56	40.00	2	1.43	
3	On average I access the internet in a week	1 – 5 hours		6 – 10 hours		11 – 15 hours		16 – 20 hours		> 20 hours		
		f	%	F	%	f	%	f	%	f	%	
		82	58.57	26	18.57	10	7.14	5	3.57	17	12.14	
4	The facilities that I often use on the internet to obtain health information are	Website		Email		Whatsapp (WA)		Twitter		Facebook		
		f	%	F	%	f	%	f	%	f	%	
		19	13.57	2	1.43	96	68.57	0	0.00	7	5.00	
		Instagram		Android application		Others						
		f	%	F	%	f	%					
		4	2.86	7	5.00	5	3.57					

Based on the needs analysis results in terms of internet use, most respondents have been using the internet for more than six years. Most of them accessed the internet when they were at home with average internet access of 1-5 hours a week. In the research conducted by Hery regarding the use of web-based information systems on adolescent, it was found that the average teenager accessed the internet for a frequency of 1.36 times a week with a duration of 1.65 hours a week to access health information [39]. Most of them used WhatsApp online media. This research is in line with Ekadinata's research that educational interventions through picture messages on WhatsApp have the highest score difference with  $p = <0.05$ . This explains that intervention through picture messages through Whatsapp is the most effective intervention in improving respondents' cognitive aspects [14]

## 1. Conclusions

Based on the results of the study, it can be concluded that Covid-19 pandemic period which limits interactions between health workers and the community make online media as a solution as an attempt to provide health education that can be used by people anywhere and anytime. Thus, promotive and preventive efforts continue to run well. The familiar facility used by the community is WhatsApp. Additionally, health workers can design an appropriate online health education model on diabetes that can be used during Covid-19 pandemic.

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