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The Needs for Information and Education Media in Supporting Self-Management of Patients with Diabetes Mellitus

Kebutuhan Informasi dan Media Edukasi dalam Mendukung Manajemen Diri Penderita Diabetes Melitus

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ABSTRACT
Diabetes mellitus is a chronic disease that has very high morbidity and mortality rate. This disease cannot be cured but can be controlled with good self-management. This research supports the need for appropriate information and educational media in supporting self-management of patien with diabetes mellitus. This research is qualitative and quantitative. The sample of this study was 105 people with diabetes. Data collection was conducted from July to November 2019 at 7 Puskesmas in Padang City, namely: Nanggalo, Lapai, Alai, Andalas, Ambacang, Kuranji, and Pauh, with interview questions and interviews. Qualitative data processing techniques with coding and data validity by triangulation and analyzed using data reduction, data presentation, and analysis. Quantitative data analysis uses SEM (Structural Equation Model) analysis with the Lisrel 8.7 program. The results showed that the informants were elderly (56-65 years), 60% had good self-management quality, 65% actively participated in chronic disease management programs, 49.5 did not have cellphones. All aspects of self-management, namely blood sugar testing, physical exercise, taking medicine, diet and health education, can be used as educational material. Research information shows the fact most still need information about self-management of diabetics and in the form of conventional media. Informants who use phones that are approved for Android-based self-management applications.

ABSTRAK
Diabetes mellitus adalah penyakit kronis yang memiliki angka kesakitan dan kematian yang sangat tinggi. Penyakit ini tidak bisa disembuhkan tetapi bisa dikendalikan dengan manajemen diri yang baik. Penelitian ini bertujuan untuk mengidentifikasi kebutuhan informasi yang tepat dan media pendidikan dalam mendukung manajemen diri pasien diabetes mellitus. Penelitian ini bersifat kualitatif dan kuantitatif. Sampel penelitian ini adalah 105 orang penderita diabetes. Pengumpulan data dilakukan dari Juli hingga November 2019 di 7 Puskesmas di Kota Padang, yaitu: Nanggalo, Lapai, Alai, Andalas, Ambacang, Kuranji, dan Pauh, dengan menyebarkan kuesioner dan wawancara mendalam. Teknik pengolahan data kualitatif dengan pengkodean dan validitas data dengan triangulasi dan dianalisis menggunakan reduksi data, penyajian data, dan penarikan kesimpulan. Analisis data kuantitatif menggunakan analisis SEM (Structural Equation Model) dengan program Lisrel 8.7. Hasil penelitian menunjukkan bahwa mayoritas informan adalah lansia (56-65 tahun),

60% memiliki kualitas manajemen diri yang baik, 65% aktif mengikuti program penanggulangan penyakit kronis, 49,5 tidak memiliki ponsel. Semua aspek manajemen diri, yaitu pemeriksaan gula darah, latihan fisik, minum obat, diet dan edukasi kesehatan dapat digunakan sebagai materi edukasi. Hasil penelitian ini menunjukan bahwa sebagian besar informan masih membutuhkan informasi tentang manajemen diri penderita diabetes dan dalam bentuk media konvensional. Untuk informan yang menggunakan telepon genggam direkomendasikan untuk aplikasi manajemen diri berbasis android.

INTRODUCTION

Diabetes mellitus is a non-communicable disease that has become a problem of global public health today because of the complications it causes. The prevalence of global diabetes has more than doubled over the past three decades, with prevalence rates far exceeding projections, almost 1 in 10 adults worldwide now have diabetes, even in 2015, the percentage of adults diabetes reaches 8.5% (1 out of 11 adults suffer from DM) in the world.[1] This disease is the third leading cause of death in 2014.[2] In addition to causing the highest deaths, health spending due to diabetes continues to increase throughout the world with social and financial implications.[3]

Indonesia ranks seventh with diabetes in the world along with China, India, the United States, Brazil, Russia and Mexico with an estimated 10 million sufferers in 2015.[4] Based on the latest data from the Basic Health Research/Riskesdas 2018, in general, the prevalence of diabetes has increased significantly over the past five years lastly. In 2013, the prevalence of diabetes in adults reached 6.9 percent, and in 2018 the figure continued to surge to 8.5 percent.[5]

The percentage of deaths due to diabetes in Indonesia is the second-highest after Sri Lanka. In addition to diabetes mellitus, including five diseases with the highest burden of hospitalization in Indonesia after heart disease, stroke, and kidney disease, the government has made it a priority program for the movement of healthy people to live with the main activities of increasing the implement-tation of early detection in health centers and preparing guidelines for the implementation of early detection in agencies government and private sector.[6]

Riskesdas 2018 in West Sumatra Province, found the prevalence of Diabetes Mellitus based on Doctor's Diagnosis of a population of all ages is 1.6% higher than the national average of 1.5% and ranks 14th out of 33 provinces.[5] For the city of Padang, the number of new cases of diabetics in 2017 was 3,514 cases, while in 2018 up to May, it reached 2,532 cases, from these data the districts of Padang Utara and Nanggalo were the highest regions of diabetics (Padang City e-puskesmas data). Diabetes Mellitus cannot be cured, but efforts are needed to improve the quality of life of sufferers.

The experts call the term self-management of patients with diabetes mellitus,

which is an effort that patients can do to form an ability to regulate themselves, cultivate lifestyles following the demands of the disease so that Self-management is very important, with the existence of self-management is expected to have an impact control of blood sugar.[7–9] Self-management of people with diabetes mellitus refers to several activities, namely monitoring the signs and symptoms, maintaining and enhancing health behaviors, and overcoming the negative effects of the disease on the patient's physical function, emotionnal feelings and interpersonal relationships.[10] The key to controlling type 2 diabetes is to change the sufferer's lifestyle in the form of self-management.[11] One very important aspect of self-management is education. Education aims to reduce or maintain blood sugar stability, regulate diet, and manage the disease.[12,13]

Health education that is followed by diabetics is very important to control the disease, with such education can increase the knowledge of diabetics and increase their awareness.[14,15] Such education can be done directly or indirectly with sufferers of Diabetes Mellitus, one of the ways is by the use of media, both print media and electronic media or online media. The government, through BPJS, has provided educational media for DM sufferers and hypertension in an activity called Prolanis, a chronic disease service program. Prolanis is a health service system and a proactive approach that is implemented in an integrated manner. This program involves participants, health facilities, and the Health Insurance Service Board in the framework of maintaining health to achieve optimal quality of life with the cost of effective and efficient health services to prevent disease complications.

One form of prolanis activities is medical/educational consultation activities.[16] Based on preliminary research conducted by researchers in July 2019, in several puskesmas in Padang City, it was found that not all DM sufferers registered in prolanis actively participated in the activity, for various reasons, such as do not have time because they have to work, no one takes the morning sufferers who are elderly and due to weak physical condition. The research also found that some DM sufferers who did not actively participate in this program came to the Puskesmas in poorer physical condition and high blood sugar due to their inability and lack of knowledge about self-management. Through this research, to identify the need for information and appropriate educational media in supporting self-management of people with diabetes mellitus.

MATERIAL AND METHOD

This study uses a quantitative and qualitative design method (match method), which was conducted at 7 Puskesmas in Padang City from July-November 2019, namely Puskemas; Lapai, Ambacang, Nanggalo, Alai, Andalas, Kuranji and Pauh. This study also received permission from the Ethical Clearance (EC) Faculty of Medicine, Andalas University, Padang. The sampling technique used purposive sampling involving 105 diabetics and their families. Data were collected by interview-

ing a questionnaire adapted from the diabetes self-management questionnaire, SDSCA (The Summary of Diabetes Self-Care Activities).[17] Qualitative data were collected by in-depth interviews using Indonesian and then translated into English. Qualitative data processing techniques by coding and data validity by triangulation and analyzed using data reduction, data presentation, and concluding. Quantitative data are processed by the steps of coding, editing, tabulating, and transferring. Data processing using a computerized system. Quantitative data analysis using univariate and SEM (Structural Equation Model) analysis with the Lisrel 8.7 program.

RESULT

The characteristics of the informants, the data collected, were as follows: gender, age, occupational Status from the community health centers, participation in the prolanis, the quality of self-management and using a mobile.

Based on the Table 1 it was obtained that, from 105 informants, the majority of women were 87.6%. In terms of age, 53.3% aged between 56-65 years or the late senior (the division of age, according to the Indonesian Health Ministry (2009). Most are not working i.e., 83.8%. Diabetics who are the most wide informants of this research come from Andalas Puskesmas, which is 27 people (25.7%) and was followed by Pauh health care as much as 23 people (21.9%). For having a headphone between which has with the note number is not much different, that is 50.5% compared with 49.5%. For participation data with prolanis activities of 73 people (69.5%), Follow the program. Reviewed for the quality of self-management then most or 60% (63 people) have good quality as well as using the same mobile phone that has with which it does not have.

The participation of informants in Prolanis and its comparison with aspects of self-management can be seen in Table 2. Based on Table 2, it can be seen that of the 57 people who routinely check their blood sugar levels (KGD) 75.4% are those who follow the chronic disease service program (prolanis), then from 48 people who do not routinely check their blood sugar levels 62.5% also informants who participated in chronic disease service programs (prolanis). From the physical exercise aspect of 68 people who routinely do physical exercise, then 75.6% are those who follow the chronic disease service program (prolanis), then out of 15 people who do not do physical exercise routinely, 66.7% are informants who follow prolanis. From the aspect of the regularity of taking medication, of the 55 informants who took medicine routinely were those who followed prolanis, and of the 50 people who did not take drugs regularly, 68% were informants who took prolanis. From the aspect of diet regulation, of the 57 informants who regularly dieted, 75.4% were those who followed prolanis, and of the 48 informants who did not regularly diet that was not good, 61.5% were also experienced by informants who followed prolanis. From the aspect of having attended health education, of the 65 people

who have attended health education, 81.5% were prolanist participants.

Then for information needs, on table 3 it can be seen that the majority of informants stated that they needed information about aspects of self-management (taking medication, eating patterns, checking blood sugar, physical exercise or sports and emotional management) even though not a few disagreed or had received information about these management aspects. This is because most informants are members of prolanis (69.5%). In prolanis activities, in addition to physical activities such as gymnastics, health counseling, there is also blood sugar checking activities every month. But for informants who did not join the prolanis had problems or difficulties.

For difficulties checking blood sugar regularly, the following are the statements of several informants, namely:

"... I don't have the time, sir... to check my sugar, sir... once checked... eh... it's high..." (Informant 21)

"... I used to check sugar regularly ... but this time because I was busy with a family event, I didn't have time to ..." (Informant 35)

"... I used to check sugar in the health center... but because my leg hurts, I can't go anymore, now I have difficulty adjusting my diet (Informant 37)

From the aspect of difficulty in adjusting diet, there are several interesting statements from informants about their experiences, such as the following:

"... in the past, sir ... I was really having a hard time managing this meal ... I once cried when I was going to eat, because the size I had to eat was very little, but what I wanted to say was an illness that required me to be like this ... now sometimes I see rice I just don't have the taste ..." (Informant 52)

"... How can we reduce food, sir ... my work is hard ... I need energy ... if I don't have enough food, I don't have the energy ..." (Informant 79)

"... I never eat less ... I only take medicine, sir ..." (Informant 43)

"... I really understand how to manage my life with diabetes ... including managing my diet, so that I can live normally like this ..." (Informant 40)

"... I try to regulate this diet by often fasting sir ... like Monday's fasting Monday ..." (Informant 72)

"... how can I possibly reduce my food, sir ... I sell food ... sometimes I eat it too ..." (Informant 24)

Table 1. Characteristics of Informants

Characteristics	n = 105	%
Sex		
Male	13	12,4
Female	92	87,6
Age (Year)		
Middle age (45-55)	34	32,4
Elderly (56-65)	56	53,3
Old (> 65)	15	14,3
Occupational Status		
Work	17	16,2
Not Work	88	83,8
Participation in the Prolanis		
Active	73	69.5
Passive	32	30.5
Origin of Community Health Centers		
Alai	9	8.6
Ambacang	14	13.3
Andalas	27	25.7
Kuranji	12	11.4
Lapai	5	4.8
Nanggalo	15	14.3
Pauh	23	21.9
Quality of Self-Management		
Good	63	60.0
Not Good	42	40.0
Using a Mobile		
Yes	53	50.5
No	52	49.5

Source: Primary Data, 2019

Table 2. Participation in Prolanis and Aspects of Self-Management

Participation in Prolanis	Blood Sugar Examination		Physical Exercise/Sports		The Regularity of Taking Medication		Diet		Education	
	Routine n = 57 (%)	Not Routine n = 48 (%)	Routine n = 90 (%)	Not Routine n = 15 (%)	Routine n = 55 (%)	Not Routine n = 50 (%)	Orderly n = 57 (%)	Irregular n = 48 (%)	Often n = 65 (%)	Some-times n = 40 (%)
Yes	43 (75.4)	30 (62.5)	68 (75.6)	5 (33.3)	39 (70.1)	34 (68)	43 (75.4)	30 (62.5)	53 (81.5)	20 (50)
No	14 (24.6)	18 (37.5)	22 (24.4)	10 (66.7)	16 (29.9)	16 (32)	14 (24.6)	18 (37.5)	12 (18,5)	20 (50)

Source: Primary Data, 2019

Table 3. Information Needs

Information Needs	Strongly Agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly Disagree n (%)	Total n (%)
Take diabetes medication regularly	34 (32.4)	32 (30.5)	10 (9.5)	24 (22.9)	5 (4.8)	105 (100)
Adjust your diet	26 (24.8)	31 (29.5)	23 (21.9)	19 (18.1)	6 (5.7)	105 (100)
Check your blood sugar regularly	50 (47.6)	25 (23.8)	15 (14.3)	10 (9.3)	5 (4.8)	105 (100)
Running physical exercise/sports	26 (24.8)	35 (33.3)	18 (17.1)	16 (15.2)	10 (9.5)	105 (100)
Management of emotions/stress	28 (26.7)	26 (24.8)	19 (18.1)	22 (21)	10 (9.5)	105 (100)
Difficulties in getting information about the healthy lifestyle of patients with diabetes mellitus	36 (34.3)	24 (22.9)	19 (18.1)	14 (13.3)	12 (11.4)	105 (100)

Source: Primary Data, 2019

For the difficult aspect of checking blood sugar regularly, the majority of informants stated that they did not experience difficulties, but for informants who did not follow Prolanis experienced difficulties, the following statements by several informants:

"... if we routinely carry out sugar checks every month, at the beginning of the usual month, so it doesn't matter ..." (Informant 103)

"... I do not have time to check sugar regularly, if my body is not comfortable, then I check ... and indeed today my sugar rises ..." (Informant 31)

"... I did not have time to join this group of mothers, because it was far, so today I was invited by a friend to do gymnastics and check sugar ...," (Informant 104)

As for the aspects of difficulty in carrying out physical exercise or regular sports, the following statements are some of the informants who followed and did not follow the prolanis:

"... If we pack ... routine exercise every week ... if here (puskesmas) it's routine twice a week ... at home I also do physical activities, walk around the house ..." (Informant 103)

"... I am a deck gymnastics trainer ... breathing exercises ... I have a group ... I move diabetics to take part in this sport activity ..." (Informant 38)

"... indeed my job is selling around sir ... every afternoon I go around food ... so if I exercise enough ..." (Informant 86)

"... I never exercise, sir ... my legs hurt, my knees are not strong, sir ..." (Informant 22)

"... I never exercise, sir, just take medicine ..." (Informant 42)

Of all the aspects of self-management of people with diabetes mellitus, emotional/ stress management is a very interesting aspect. In percentage terms the number of informants who agreed with the information needs managing emotions/stress was higher than those who agreed at more than 50% (26.7% strongly disagree, and 24.8% agreed), but there were 18.1% who stated neutral, more than 30%

admit they have no difficulty managing emotions/stress so that their blood sugar levels are stable. Various responses emerged from informants as follows:

"... it's true, sir ... when I have a lot of thoughts ... my blood sugar goes up quickly ..." (Informant 48)

"... how come sir ... sometimes I am not able to control my mind ... the problem of children who never get along ... economic problems ... especially I have divorced with my husband ..." (Informant 28)

"... when I'm tired of working ... my blood sugar goes up ... especially my husband doesn't work ... while I have to support my family sir ..." (Informant 89)

"... I used to be very difficult to control my mind ... emotional fast and I rarely at home, but now I have begun to calm down ... the children have all grown up big ..." (Informant 67)

"... I am old, sir ... the children have grown up ... I have retired ... I have begun to calm down ..." (Informant 38)

"... No problem sir ... I can control my emotions ... no stress ... no problem ..." (Informant 39)

From all aspects of self-management of diabetes mellitus, difficulties in getting information about healthy lifestyle of diabetics, most informants stated that they did not experience difficulties. There were still more than 18% who were neutral, even more than 24% who stated difficulties in getting information the healthy. Based on the results of interviews with informants revealed things related to the information needed as follows:

"... I really want to know, if the sugar has risen what are the signs... so that I can know not to get this high... " (Informant 7)

"... What is the normal amount of blood sugar, sir... " (Informant 9)

"... What food should I eat instead of rice, sir..." (Informant 8)

"... What fruits should not be eaten, sir... said bananas also should not..." (Informant 44)

"... I do not take part in health counseling activities, sir... because I also have a family of healthy people... my sister is a nurse..." (Informant 22)

"... I didn't have time to take part in counseling activities because I had to sell, sir..." (Informant 3)

"... I only participated in gymnastics for the first time... and that's because I was invited by a friend, sir... before... never... no one invited..." (Informant 8)

In determining the appropriate variables in educational media material, all aspects of self-management variables were carried out. Quantitative data analysis was tested using SEM (Structural Equation Model) analysis with the Lisrel 8.7 program, as in the annex to the statistical test results, it was found that chi-square = 683.77, df = 384, p = 0.00000, RMSEA = 0.0088. With a value of 6.83 and df = 384, the chi-square value/df = 1.66<2, p = 0.00000> from 5% (0.05) RMSEA = 0.0080 <from 5% (0, 05), so that the variables: blood sugar checks, physical exercise, dietary arrangements, taking medication, have met the requirements and can be used as educational material for self-management of patients with diabetes mellitus.

Based on several considerations relating to the condition of informants such as the majority of the elderly who are not accompanied by family and do not have a mobile phone (49.5%), and considerations for program managers in community health centers, such as the following:

"... Every patient has a book, sir ... but never brought it, the reason is forgetfulness, missing and so on, if we keep it here, when will they read it .." (Lapai community health centers)

"... for the issue of the visitors book, I strongly agree, sir... so that we can monitor the patient's development from time to time in the book..." (Ambacang community health centers.)

"... need a way so that the book is always carried by patients, not lost and not difficult to carry it, especially those with diabetes who have many forgetfulness and the elderly again..." (Alai community health centers)

"... I'm not sure... ladies and gentlemen, the diabetic patient can we give an android application, sometimes important information is told to just text sir..., all this time we provide information from the leader of the group sir ... then on the phone ..." (Lapai community health centers)

Based on the results of the study above, it has been determined in this study that the educational media that will be applied in the later stages of this research are divided into 2 types, namely, conventional educational media in the form of companion books and android-based educational media.

DISCUSSION

This research has identified the quality of self-management of people with type 2 diabetes mellitus, generally in the good category, which is 60.0%. This research has also identified the problems faced by diabetics in self-management, both those who participate in prolanis activities and those who do not. This study also found differences in the quality of self-management between those who followed prolanis and those who did not, thus diabetics needed a system for life to be organized, well managed so that living in regular conditions to maintain the stability of blood sugar levels so that the quality of life would be good. Various studies in Indonesia have also shown that prolanis has a better impact on the health condition of diabetics.[18,19] The quality of self-management is inseparable from several factors that support it, such as gender, occupation, and age. For gender factors, this study has identified the majority of informants are women (87.6%) aged between 56-65 years who are not working. Women have a higher average quality of life for an age because it is easier to understand activities to prevent diabetes in daily life.[20] This is because women have enough time to participate in prolanis activities such as physical activities such as gymnastics, health education and blood sugar checking activities. Through programs like this, diabetics can also socialize with fellow sufferers, so that they can reduce the burden of their illness mentally because they can share information in over-coming negative effects of illness, daily self-management, emotional feelings, and inter-personal relationships.[10,21]

In this study found two things that are also very interesting, the first is that not all sufferers who have participated in prolanis activities have good self-management quality, which is 31.51%, meaning that some patients have participated in this activity but have not able to change his lifestyle following the demands of diabetes self-management. For this condition, it is necessary to study in-depth the factors causing this to occur, several factors that can be taken into consideration such as; perceptions of sufferers about the purpose of blood sugar testing activities, emotional conditions, pain, cost and motivation of the family, including the patient's attitude to the

quality of information.[22,23] Greatly affect the results of prolanis activities, especially educational activities, so it needs a strategy to overcome them.[24]

In terms of participant, fees do not have to pay because this activity is fully funded by Indonesian health insurance/BPJS, especially for laboratory examinations. The factor of family support is also very decisive. Family and social support are important aspects of adherence to diabetes management. Numerous studies have shown a positive and significant relationship between social support and adherence to diabetes treatment. Including social support directly affects health outcomes, utilization of health services, and behavior change.[25–27] Ideally, families who have family members who have diabetes should have a role to play in helping diabetics.[26,28]

The study found that most diabetics who came to health facilities were not accompanied by their families, except patients with weak physical conditions with high blood sugar. Next is what about patients with diabetes self-management who do not follow prolanis. This study found 59.38% of patients who did not follow prolanis with poor self-management conditions. Advocacy for diabetics needs to be done so that they can make self-management well, even though they cannot join the prolanis through educational activities. This is very important because education has a significant impact on the quality of self-management of diabetics so that it affects the stability of blood sugar, regulating diet and managing disease.[12,13,15,29–31]

Then from the information needs data, the majority of informants stated that they still need information about management aspects diabetes mellitus. Although in fact, they have gotten these activities from the prolanis activities that were followed. The information needed by informants varies greatly, but it is still related to the food that can and should not be consumed, including fruits and vegetables, dietary arrangements, dietary management strategies and conventional ways to control blood sugar. Based on this information it can be seen that some informants already have their way of maintaining blood sugar stability, such as fasting. Fasting is indeed able to maintain the increase of blood sugar whether fasting every day for a month such as the month of Ramadan or intermittent fasting.[32,33]

In addition to fasting informants also carry out regular sports activities, experts find out about the effects of physical exercise or by exercise in controlling blood sugar.[34–36] In addition, some informants also use traditional methods of maintaining blood sugar such as taking herbal medicines, herbal remedies that help reduce blood sugar are combined herbs.[37,39] Then other interesting things expressed by informants are always protect yourself from emotional stress. Research shows that stress and diabetes are like a vicious circle.[40–42] So that a stress-management intervention is needed to be able to help reduce stress and increase self-efficacy, social

support.[43] This study identified that there were several problems that caused informants to experience emotional distress or stress. Economic and family problems, do not have a fixed income, this is experienced by some informants who are not affiliated with prolanis activities. From this information, the most important thing is the inability of some informants to check blood sugar regularly, for various reasons, whereas with strict blood sugar control can reduce the risk of developing microvascular diabetes complications.[38]

From the test of factors for modeling, it is determined that all aspects of self-management are suitable to be used as the material in educational media, and the first stage of educational media in the conventional form is a self-management companion book for diabetics, whereas for the second stage this educational media will be developed in the form of android based education media. Based on the results of the analysis so that this study recommends several things namely; information needed to support diabetes self-management related to taking the medication regularly, managing diet, checking blood sugar, carrying out physical or exercise training, managing emotions or stress and education. Even though some of these sufferers have gotten it from health workers or the media so far. Then the media is still in the form of conventional media, this is very interesting, of course. Informants still need conventional educational media during the era of digital technology. It is undeniable that the use of internet-based digital social media is widely used today in the health sector, especially for diabetics.[44,45] Because social media can be utilized to modernize strategies to reach all age groups and to adapt programs to current communication trends, all of which are offered at relatively low cost and using media online can provide convenience to users in disseminating health information visually as widely as possible with an attractive appearance.[46]

However, to be able to use the technology is strongly influenced by institutional factors and managerial characteristics of health,[47] and the user is strongly influenced by several technical factors.[48] In this case including the old-age factor, then ownership the mobile.

CONCLUSION DAN RECOMMENDATION

Information needed to support diabetes self-management is related to taking the medication regularly, managing diet, checking blood sugar, carrying out physical or exercise training, and managing emotions or stress. Media needed in education is conventional media in the form of a companion book for people with diabetes mellitus. Although this research found that some informants still need conventional media, this study also recommends the use of media or Android-based applications, especially for informants or sufferers who use mobile phones, which are tailored to their characteristics and needs.

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