

## **Health 4.0: body management for autoimmune using instant messaging technology. Case Study: Autoimmune**

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**Abstract.** Autoimmune disease is caused by our immune systems that attack our body. The autoimmune patients are treated by doctor that is specialized in neurology. The doctor will only give them some treatment to maintain the condition of the patient. Every patient has different body condition therefore the doctor treatment is different to manage each patient condition. It is important for the doctor to pay attention give different treatment to each patient depend on the autoimmune they have, and the patient condition. One of the method in monitoring patient condition is by doing frequent communication with the patient, so the body condition of patient can be controlled. In recent years, there are many kinds of technologies that the doctor can use to communicating with patients. One of the technology is instant messaging. The authors will conduct a descriptive research on how instant messaging can help the doctor and autoimmune patients managing the quality of life by using questionnaire and analyzing the result.

Keywords: instant messaging, autoimmune, quality of life

### **1. Background**

In recent year, the technology has been developed very rapidly. The impact of the new technology has revolutionized many industries. The Internet of things, or cyber-physical systems, is one of the new technology that gave big impact to the industry. The healthcare industry beginning to utilize internet of things by using bio sensor to connect to the virtual world. It could be use in the management of autoimmune because it could optimize the accuracy and allow for the precise mapping of symptoms. Furthermore, the autoimmune patients can be encouraged by internet guided interventions to implement more physical activity in their lives. This cyber-physical system could flag up sudden changes in their daily activities, which well be associated with a flare up (Kumar & Sharma, 2017). Technology can help monitoring patient's vital signs by remote monitoring (Thimbleby, 2013). According to the International Telecommunication Union, the number of mobile phone users are more than 5 billion in the world and more than 85% of the world population is covered by commercial wireless signals (Ebrahimi, Mehdipour, Karimi, Khammarnia, & Alipour, 2018). Mobile phone apps have been used in healthcare recently. According to journal, mobile phone increase attention of patients as one of potential tools for supporting cancer patient. Authors found the presence of instant messaging technology have brings benefits in the field of healthcare. This journal discussed about the use of Instant Messaging lectures for autoimmune patients (Rincon, et al., 2017).

This apps can also empower patient to do their activities more effectively, support their behavior changes in daily life, help their self-monitoring to take care of their symptoms, increase their education of symptoms, and improve the patient's self-confidence by the feeling of being in contact and monitored with their healthcare team (Rincon, et al., 2017).

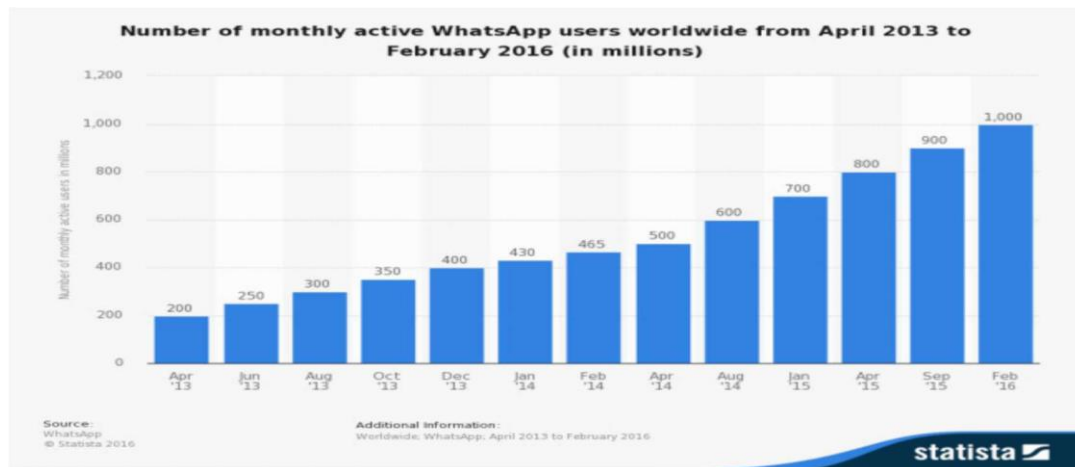


Figure 1. Survey Analysis on the usage of Instant Messaging Messenger (Kumar & Sharma, 2017)

First, Authors learn about technological strengths and weaknesses in Instant Messaging. However, there are some patients that have concerns of their healthcare environments. The authors try to review how using instant messaging apps can improve patient's health. Some journals explain that instant messaging beside for communication, instant messaging can be used for other things, such as to spread information to communities group. Thus, instant messaging can be useful for education, health, etc. (Head, Noar, Iannarino, & Harrington, 2013). Since there are only a few mobile apps that focused for improving patient's quality of lives, we learn about the impact of instant messaging for improving patient's quality of life.

## 2. Literature Review

### 2.1 Autoimmune

Autoimmune can be defined that the functional immune system of the body of Autoimmune patient have "horror autotoxicus" as defined by Paul Erhlic's (Cho & Gregersen, 2011). Taking care and managing the body are needed for people with autoimmune disease Stable condition of each individual with autoimmune is the key that every patient can achieve their quality of life (Plante, 2018)

Each individual has different perspective of quality of life. It depends on some factors, such as environment. Environment become one of the key to make body can heal itself. The environment can help autoimmune patients manage their body by knowing and learning to the signal of their body themselves.

### 2.2. Technology

In recent years the mobile phone technology has been developed very rapidly. It has revolutionized the way people communicate using their cell phone. According to World Health Organization reports, the application of mobile health and wireless technologies for supporting and achieving the objectives of the health industry has changed the image of health care service delivery (Ebrahimi, Mehdipour, Karimi, Khammarnia, & Alipour, 2018). Mobile health can provide many things, for example, the specialist can get the patient-related information, support the disease diagnosis, remind the time of medications, and measure physical activities. Thus, mobile health monitoring service are extremely effective for patients with chronic disease (Ebrahimi, Mehdipour, Karimi, Khammarnia, & Alipour, 2018). One of the most popular technology in smartphone is instant messaging because it has the ability to enhance communication within a group (Bouhnik & Dessen, 2014). Healthcare communication between physician and practitioners using instant messaging has not yet, to our knowledge, been researched

thoroughly. Structured interviews were carried out with autoimmune people who use the application in order to communicate with their doctors. There are four main purposes of instant messaging group:

1. Communicating with doctor and practitioner
2. Nurturing the social atmosphere
3. Creating dialogue and encouraging sharing among patient
4. As a learning platform (Bouhnik & Deshen, 2014)

### 3. Research Method

Lately, many people using instant messaging. They use instant messaging to communicate with their friends within a group. Healthcare communication between doctor, practitioner and patients are important for autoimmune people but has not yet been researched. Therefore, authors want to conduct qualitative explanatory research using questionnaires and interview to the person who has experienced with this method.

Authors developed some questionnaires for patients to detect their acceptance in using mobile phone health learning. Authors found two autoimmune patient communities which are involving the use of instant messaging as their learning tools to increase their health and quality of life. There are two medical groups of instant messaging which are learning about the health of autoimmune.

1. Odamun (Orang dengan autoimmune)/ Imunesia (Consist of people with autoimmune)
2. MS and NMO warrior (Consist of people with MS and NMO disease)

Both group using an online learning method by instant messaging. One of important environment for them are online environment, they don't need to travel to meet their doctor. The online environment helps them to ask about their condition and get answer from the group to make a better condition for each of them. The groups consist of doctors, as practitioners and patients. The groups are used to interact between practitioners and patient. Authors want to learn how effective the online learning using instant messaging group to make a better quality of life for auto immune patient. Each member of the group is unique since the body condition of each other is different depending to their immune. They make an online environment to ask about their condition and get answer from the group to make a better condition of their health. They have different health conditions to live their life. Therefore, authors chose to conduct a qualitative explanatory research to study about the impact of instant messaging learning system for them.

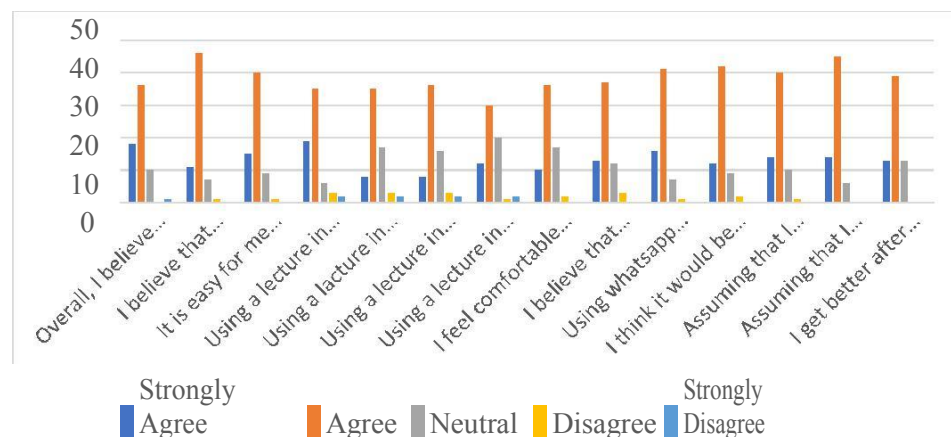
In this questioner there are six variables that will be used to explore perceptions, attitudes, and intentions before and after the use of technologies.

1. The perceived usefulness: shows how users believes that using whatsapp lecture would enhance his/her performance (Razmak & Belanger, 2018).
2. The Perceived of use or user friendliness: shows how the user believes that using whatsapp lecture is free of effort (Razmak & Belanger, 2018).
3. The compatibility: shows that the whatsapp lecture is perceived as consistent with the past experiences, existing values, and needs of potential adopters (Razmak & Belanger, 2018).
4. Communications: the extent to which people are able and willing to communicate thorough instant messaging (Razmak & Belanger, 2018).
5. Users Attitude: shows how each user evaluates and associates the target system with his or her job. (Razmak & Belanger, 2018)
6. Behavior intention: "an indication of individual's readiness to perform a given behavior, and it is considered to be the immediate antecedent of behavior" (Razmak & Belanger, 2018)
7. Patients health progression after joining the whatsapp lecture: Shows the impact of whatsapp lecture to their health

### 3.1. Data

**Table 1. Questionnaire**

Question No	Questions	Strongly Agree	Agree	Neutral	Dis-agree	Strongly Disagree	Total
1	Overall, I believe that finding and managing my health solution through information about health from whatsapp lecture is easy for me	18	36	10	0	1	65
2	I believe that learning to manage my health through whatsapp lecture is easy for me	11	46	7	1	0	65
3	It is easy for me to become skillful at using whatsapp	15	40	9	1	0	65
4	Using a lecture in Whatsapp will be useful to manage my health	19	35	6	3	2	65
5	Using a lecture in whatsapp, I will get my remission more quickly	8	35	17	3	2	65
6	Using a lecture in Whatsapp group to manage my health is compatible with my personal lifestyle	8	36	16	3	2	65
7	Using a lecture in Whatsapp group to manage my health is compatible with my learning preference	12	30	20	1	2	65
8	I feel comfortable communicating online with my doctor in the whatsapp group lecture	10	36	17	2	0	65
9	I believe that using whatsapp group lecture will promote my communication with my doctor in that group	13	37	12	3	0	65
10	Using whatsapp group to lecture to manage my health condition is a wise idea	16	41	7	1	0	65
11	I think it would be vey good to use electronic record better than printed record for my health lecture	12	42	9	2	0	65
12	Assuming that I have access to whatsapp group, I will frequently use it	14	40	10	1	0	65
13	Assuming that I have access to whatsapp group lecture, I will recommend it to others.	14	45	6	0	0	65
14	I get better after joining whatsapp group lecture	13	39	13	0	0	65



**Figure 2. Acceptance of autoimmune patients using Instant Messaging lecture for body management**

#### **4. Analysis**

Perceived ease of use (Question 1, Question 2, and Question 3):

the number of Instant Messaging increase every year because it is easy to use. Even for people that are in difficult situations and conditions find that Instant Messaging is easy to use.

Perceived usefulness (Question 4 and Question 5):

Most of the patient have mobility problems, therefore Instant Messaging lecture is very useful because Instant Messaging lecture can save their time and energy. It really helps them because by using Instant Messaging lecture they don't need to make appointment with the doctor and go to the hospital whenever they have some health issues. The Instant Messaging group member consists of doctor that share some useful information for the patient to get remission or stable condition.

Compatibility (Question 6 and Question 7):

Each patient in the group has different health conditions, thus each of them has different problem and lifestyle. Instant Messaging lecture can accommodate this issue because the doctor can help the patient just by sharing some useful information's.

Communication (Question 8 and Question 9):

The patient feels comfortable communicate with the doctor means that they feel that there have no barriers between them and the doctor in the group. Instant Messaging lecture has eliminated the barrier between patient and doctor. All the patients feel comfortable to talk with their doctor in Instant messaging group, because they get empathy from the group, the environment that they need.

Attitude toward usage (Question 10 and Question 11):

The Patient feel that the decisions to use Instant Messaging lecture is a wise idea means that the Instant Messaging lecture has help them in many ways. Such as, improve their quality of life, save their time and energy, boost their confidents. It can be seen that instant messaging can be useful for body management

Behavior Intention (Question 12 and question 13):

Electronic record for lectures is owned by both doctor and patients, on the other hand, printed record is owned by the doctor only.

Health progressions (Question 14):

Since using instant messaging lecture helps patients very much then they like to use instant messaging lecture more often. Instant messaging is also effective to minimize the flare-up condition, which are usually attackted to autoimmune patient in their daily life since they can learn to manage their body.

#### **Summary**

We learn that community make them encouraged to take care of their own disease. Each of them can collaborate with the doctor and community to make it more effective. The mobile technology effectively support each patient to take care of themselves. The snapshot of daily activity of the overall patient's can be seen more effectively by the doctor than during a regular follow-up visit. Patient's anxiety can be reduced in this online community.

Physical examination is more accurate and more focus because they have the right tools for examination, such as MRI machine, laboratorium, ERG machine, and physiotherapi room. Also the

result is recorded by the doctor therefore they can have medical record of the patients. On the other hand, there is no record of the impact of instant messaging lecture. Unlike using instant messaging lecture, the doctor can give prescription based on the result of physical examination.

Health 4.0 is needed and very useful for autoimmune patients. Frequent interaction between doctor and patients is needed to manage the patient condition

## 5. Future studies

There are some autoimmune patients that have difficulty in typing text message using instant messaging, thus by using video call the number of patient using instant messaging may increase because using video call is easier than texting. The instant messaging lecture impact on quality of life may improve if they use video call for communication, the doctor can check the condition of the patient more accurately because it can reduce miscommunication or miss understood.

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