Readiness of Health Professional Using Computers, Internet and Mobile phone to Digitalize Timor-Leste' Healthcare System

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Abstract

Introduction: In the digitalization era, health care system was conditioned with health workers' abilities to adapt media of digital technology. Digital technology media was used to strengthen and fasted the health care for patient and community.

Purpose: This study aimed to explore the accurate information of health professional utilization digital technology during doing their work at health facilities in Timor-Leste.

Material and Methods: This was a Cross-Sectional Study with 56 respondents. Data were collected since 1 to 30 February 2023 using a Google Form questionnaire via social media including WhatsApp's, email, Facebook and Twitter. Inclusion criteria were: health professional living in Timor-Leste, able to respond to the questionnaire. Data were analyzed using descriptive analysis.

Result: The majority of health professionals who participated were male (54.2%), used hand-held phones (100%) to facilitate their daily activities including related with their work activities. Other characteristics in digital technology tool use were ability to use Microsoft word (78.3%), Microsoft Excel (76.7%) and Power Point (81.7%). E-mail use was reported by 89.2%, and WhatsApp's by 81.7%, About 74.2% used zoom/webinars/Google meeting applications, and about 72.5% using computers in the workplace. Around 96.4% identified needs to improve their knowledge and skills in using ICT in the future to facilitate their activity.

Conclusion: The majority of the health professionals in Timor-Leste reported using computers, internet, and Mobile phones to facilities daily activities, and they need to obtain the training to improve their knowledge, attitude and psychomotor skills for the future.

Keywords: Digital Technology, Healthcare system

Introduction

In the digitalization era, digital technology media is utilized to strengthen the healthcare activities process in terms of patient and community attendance. Global strategies have promoted the use of appropriate digital technologies to support processes for overcoming major health system challenges, achieving equitable access to digital resources to catch up (World Health Organization (WHO), 2020). Regardless, the aim in using digital technology is to increase health professionals' abilities in the workplace and then guarantee quality as an important factor as an important factor to facilitate their work through future media technology information and communication (Harerimana & Mtshali, 2019). In terms of digital technology uses, in the systematic review were conducted had reported that challenges in application are normally caused by four aspects, namely: data delays, data fragmentation, privacy security and data security vulnerabilities (Wang et al., 2021). In Timor-Leste, health professionals are faced with the constraints of using the Internet through computers and mobile phones to facilitate communication and information in health services, both in the urban and regional areas. Research conducted in Timor-Leste identified that internet access positively affects economic growth, so recommended to the Timor-Leste Government a need to encourage Internet use by making digital technologies readily available across the country and affordable (Rumbia et al., 2022).

Therefore, the Timor-Leste government through the Ministry of Health has made efforts to provide various kinds of training and development for health professionals related to management, clinics and including digitalization system establishment in health facilities. However, these efforts have not significantly influenced the reality of the digitalization and capabilities of health professionals to use the Internet, computers and other media, and remains unsolved in Timor-Leste. In addition, to date research has not been carried out in Timor-Leste to examine the gap experienced to answer the demands of globalization in the future.

About 51% of the world population has access to the Internet to support their daily activities, both generally and across health sectors. Around 24% of the population in East Africa reportedly that they have gate various information via internet access use media technology digital (Watson & Wilkinson, 2022). In Chile, it was reported around 2,681 people who used the Internet via mobile phone only was about 20.8%, this increased to 41.5% in rural areas and access internet via smartphones was 57% (Correa et al., 2020). Based on study findings from Timor-Leste, the

ability to use computers was at a poor level in facilitating to provide the basic information related health system (Moni et al., 2022).   Internet use has been reported to have positive impact on economic aspects and health services, because if health services are functioning appropriately, this will have a positive impact on people's economic activities. It has been indicated that for every 1% increase in Internet use, economic growth will increase by 27.65% based on the study of the effect of crude oil prices and Internet on Economic Growth in Timor-Leste (Rumbia et al., 2022).

At the previous a review of clinical informatics competencies in nursing to inform best practices in education and nurse faculty development were conducted by Armor et all on 2020 was identified the indicated continued confusion surrounding informatics competencies and then hot they integration digital technology media into nursing curricula affects the professional nursing workforce (Forman et al., 2020). Strategies to improve health professionals' digital use skills utilizing e-simulation become innovative techniques used to improve health workers' informatics competencies skills and supporting job implementation (Forman et al., 2020). Digital media and Internet technology has become a communication tool needed by everyone in the era of globalization. People regularly communicate and can receive quick responses or answers whenever and wherever they are.

In the globalization situation, people are carrying out the activities such as business, healthcare, education and others, cannot be separated from the use of digital technology such as use Internet, computer and mobile phone (Paul et al., 2023). In the United States it was found that COVID-19 mobile applications were innovative tools in helping manage care facilities as well as helping to provide new channels for real-time communication, promoting early detection of disease (Abbaspur-Behbahani et al., 2022). Today, in globalization terms, where we have entered in to the industrial revolution 4.0 era, so that, many activities always conducted within technology digital system approach to be achieve the professional work. Health workers face the progress of developing a digitalized networking system in supporting health services both in hospitals and health centers. Given that in Timor-Leste academics began to develop a networking system for using computers connected to the Internet in the engineering faculty, this is likely to be expanded or applied into health services (Freitas, 2023).

Based on the above issues, researchers were identified the new ideas to contribute to the Readiness of Health Workers to Face Digitization of Health Care system in Timor-Leste. It

considered good solutions to solve existing problems and will be achieve a programs successfully. The objectives of this study to explore the accurate information of health professional utilization digital technology during doing their work at health facilities in Timor-Leste.

Materials and Methods

Digital Technology

Computers, the Internet and mobile phones are an important part of digital technology media to facilitate humans doing their work around the world in the present industrial revolution 4.0. The Internet is also one mechanism for linking to mobile phones and computers for many people in the world, so that to enter the digital system in the world we need to use smartphones to enable access (Correa et al., 2020). In large and developed countries, it has also been shown that Internet access through mobile phones is much greater than through computers, because mobile phones can be taken anywhere. Digital technology literacy and efforts to access today's more modern technology products, such as Internet access, have indicated that it is very useful to overcome the lack of knowledge and skills. Through this model, it will have a tremendous impact on the services systems of various sectors, including the health care system (Matli & Malatji, 2024).

Study setting

The current study was conducted in Timor-Leste with health workers are respondents. Timor-Leste is located in alongside two key neighboring countries such as Indonesia and Australia. It a small country of 15,007 km^2 and divided into 14 municipalities. The population based on the census 2022 was about 1,340,434 persons (Ministerio das Financas, 2022). The health sector is one principal area where highest attention is paid by government, especially by the Ministry of Health (MoH) Timor-Leste. Available health facilities include one national hospital, five referral hospitals, 72 community health centers (CHCs) and 329 health posts (HPs), attended by about 3,000 health workers in Timor-Leste.

Study design

This was a descriptive quantitative study undertaken to determine readiness of health professionals in using digital technologies to support their daily activities related to health care

processes in Timor-Leste and also to identify their needs in terms of capacity building related digital technology use.

Participant recruitment and data collection

Participants in this study were health professionals working across every health facility in Timor-Leste territory. They had the same probability to participate in this study, with online data collection undertaken in June 2023. The sample size was based on the convenience approach and data were collected from 101 health professionals, were they accessed the questionnaire by Facebook (fb) or WhatsApp's media. Data was collected used questioner were developed by researcher and has been used in another own research before. Questioner distributed to respondents via Facebook (fb) and WhatsApp's has been setting in google form approach.

Data analysis

Data were analysis used SPSS version 20 in descriptive statistic for data analysis.

Ethical consideration

The respondents were declared their disponible with the personal statement to involve in the study in inform consent form and also obtaining Ethical approval from the National Health Institute (*Instituto Nacional de Saúde*)-Health Research Ethical Committee, MoH, Timor-Leste in 2022.

Result

The result of study presented in the report such as below components:

Socio Demographic

Table 1. Description of the respondents

No	Indicators	f	%
1	Gender		
	Male	65	54,2
	Female	55	45,8
	Total	120	100
2	Profession		
	Medical doctor	20	16.7
	Nurse	51	42.5

	Midwife	25	20.8
	Public health	4	3.3
	Analysis laboratories	5	4.2
	Bachelor of Environmental health	6	5.0
	Nutritionist	9	7.5
	Total	120	100
3	Level of education		
	Doctor Degree (S3)	3	2.5
	Master degree (S2)	8	6.7
	Bachelor degree (S1)	86	71.7
	Diploma three degree (D3)	15	12.5
	Health Nurse School (SPK)	8	6.7
	Total	120	100
4	Municipality	F	%
	Dili	42	35.0
	Baucau	10	8.3
	Viqueque	9	7.5
	Covalima	10	8.3
	Ermera	7	5.8
	Ainaro	6	5.0
	Lautem	8	6.7
	Bobonaro	5	4.2
	Manatuto	4	3.3
	Manufahi	6	5.0
	RAEOA	7	5.8
	Aileu	6	5.0
	Total	120	100
5	Position		
	Staff work at health facility	77	64.2
	Graduated not yet work	43	35.8
	Total	120	100

Based on Table 1 above, there were more males (n=65, 54.2%). Three professional groups actively participated, namely nurses (n=51, 42.5%), midwives (n=25, 20,8%), and medical doctors (n=20, 16.7%). Various other professionals comprised less than 16%. About 71.7% had a bachelor degree in health education and 35% of participants were from the Dili Municipality (Timor-Leste capital city. the majority of participants were permanent employees (n=77, 64,2%) who worked at health facilities in public and private sectors.

Digital Technology utilization experiences

Table 2. Description of the respondents' digital technology use

	Indicators	F	%	Chi-Square Test (Asymp.Sig)
1	Hand Phone use			
	Yes	120	100	0.000
	No	0	0	
2	Microsoft Word use			
	Yes	94	78.3	0.000
	No	26	21.7	
3	Microsoft Excel			
	Yes	92	76.7	0.000
	No	28	23.3	
4	Microsoft PowerPoint use			
	Yes	98	81.7	0.000
	No	22	18.3	
5	e-mail use			
	Yes	107	89.2	0.000
	No	13	10.8	
6	WhatsApp use			
	Yes	110	91.7	0.000
	No	10	8.3	
7	Zoom/webinars/Google meet and others use			
	Yes	89	74.2	0.000
	No	31	25.8	
8	Have computer in work place			
	Yes	87	72.5	0,000
	No	33	27.5	

Table 2 presents details of respondents' digital technology use. Chi-square test indicates that all of components are significant and more than 50% answered yes.

Table 3. Distributions of technology use

No	Indicators	N	Min	Max	Mean & S.D
1	Hand Phone use	120	1	2	2.00 ±0.00
2	Microsoft Word use	120	1	2	1.78±0.41
3	Microsoft Excel use	120	1	2	1.77±0.42
4	Microsoft PowerPoint use	120	1	2	1.82±0.39
5	e-mail use	120	1	2	1.89±0.31
6	WhatsApp's use	120	1	2	1.92±0.28
7	Zoom/webinars/Google meet use	120	1	2	1.74±0.44

8	Readiness computer in work place	120	1	2	1.73±0.45

Based on the above table, all variables have mean scores more than 1.5 and S.D. no more then 0.5. The results imply that all used digital technology media to facilitate their regular job every day in the work place.

Capacity building need and readiness to use digital in Timor-Leste

Table 4. ICT knowledge and skills needs

No	Capacity building	F	%
1	Do you need to improve or deepen your knowledge and skills in using ICT in the future?		
	Yes	108	90.0
	No	12	10.0
	Total	120	100
2	In your opinion, is it time for Timor-Leste to build a digitalization system in health care facilities?		
	Yes	113	94.2
	No	7	5.8
	Total	120	100

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According to Table 4,90% of respondents stated that health professionals who worked at health facilities in Timor-Leste needed to improve or deepen their knowledge and skills in using ICT in the future to enhance their regular working. Based on the results, all health professionals used hand-held phones for supporting their activities, in terms of the communication and coordination with others in the work place and community areas.

Discussion

Socio Demographic

In this study looking for the gender based indicated that male is majority involved to provide the information related with the question where distributed via google are man then

women from hold Timor-Leste territory. Other side it is mean that man is more interesting than women to take part in the study to provide the idea and opinion. This result according with the several study were conducted before indicated that man and women are not equally interested or willing to participate in exercise and sport science research (Nuzzo & Deaner, 2023).

This result shows that men often respond more quickly to research issues and are always very interested in seeking knowledge and involvement in the processes. Men often to ask for their contribution by expressing their own opinions and ideas. So they were happy to have expressed their opinions. The result of the study seven category health professional was majority are nurse's, secondly is midwife and thirty is medical doctor involved in this study. Looking for education level of the respondents are majority with bachelor degree level in health area such as (medical doctor, nurses, midwifery and others) compared with other level education. The most respondents in the study come from Dili Municipality around. Staff work at health facility it is mention that more health professional was worked event in public sector or private sector.

Digital Technology utilization experiences

<u>Hand Phone use</u>

Based on experience using digital technology media detected health workers in Timor-Leste, there are very varied experiences. One example is their experience in using hand phone or mobile phone to support their daily communication with family members, health workers and the community in general. In this ability, the health workers who are the respondents indicate that 100% use the phone. In this reality we can imagine that in this era of modern globalization everyone automatically uses the hand phone every day to facilitate their activities to be faster and more effective and more likely to be successful.

These results are very relevant to the scoping review results from some scientists have shown that the use of m Health has great potential as a used tool to support health workers improve primary care and prevention of the population from various diseases. On the other hand, the use of telephones can strengthen training and recruitment of health promoters to support health services. It can also support to harmonious or strengthen the effectiveness and adequate health care of communities (Early et al., 2019). Therefore, in Timor-Leste we want to promote health workers how to hand phone more systematically, effectively and efficiently in their daily lives. The use of

the hand phone can be systematic to support the learning process for those who have a great interest in continuing their studies, those who have a great interest in conducting research, writing articles and also facilitating them to promote health for the general population of Timor-Leste. Through these means, health workers will benefit better because of the use of hand phone. This will help the Ministry of Health to achieve quality health care goals in the future.

<u>Computer use</u>

Based on the finding of this research, health workers have experienced using special electronic MS Word technology to support their daily work at home and in the workplace. However, there are has any health workers who do not access or use MS Words to support their work at home and in the workplace. The result is corresponding to the previous research by another scientist conducted that health workers in some parts of the hospital in Africa's majority of respondents explained that they used Microsoft Word to be very efficient (Sibiya et al., 2023). Health workers working in hospital, community health center, central service the Ministry of Health and university throughout the territory of Timor-Leste is obliged to understand the use of Microsoft Word. We also see that in this era of globalization everyone is always using digital technology media to add information to their daily work. The messages conveyed are always prepared in electronic models and often use words for preparation. It is time for all health workers to have enough skills to use the Microsoft word at any time so that they can support them to work more quickly, effectively and efficiently to ensure quality health services in Timor-Leste.

The second skill is the use of MS Excel, according to the results of this study shows that health workers as respondents have access and have used MS Excel to support their work related to making a count, at home or in the workplace. However, there are also has some of the respondents who have not yet accessed or used MS Excel to facilitate their special work on the issue of contagion, at home or their workplace. This research was supported by research conducted in the hospital in Nigeria, indicated that the majority of the health workers in the hospital use of computers is inefficient using Microsoft Excel (ME) (Sibiya et al., 2023). Health workers also have their daily health care-related work always calculate the count of medicines doses, work equipment, work schedule, budget calculation, work technical report, capacity building process and research results. Therefore, for those who do not have the opportunity to access the use of the

ME in Timor-Leste, it is necessary to promote them to adopt the use of computer media for their daily work.

Based on the research results it shows that in some used MS PowerPoint to support their work at home or workplace. However, there are some of them who respond that they do not have access to or use MS PowerPoint at home or workplace to support their work. This skill is linked to how to prepare a presentation slide in relation to their studies or work issues.

Email and WhatsApp's use

Based on the above result also indicated that majority of health workers in Timor-Leste was have ability and opportunity to access use e-mail and WhatsApp's on supporting their daily work. This result was according with the other several result study was mentioned that the ability in e-mail and WhatsApp use was efficiency (Sibiya et al., 2023). Other study also was reported that in the South East Asia Region (SEARO) as only 5 countries was adapted the telemedicine guideline to support health workers during conducting the health care to the population, that is India, Bangladesh, Thailand, Indonesia and Nepal only (Sharma et al., 2023). On the other hand, some respondents have not yet accessed or used emails and WhatsApp to facilitate their daily work. Although the percentage is small, it is also very significant because it is a barrier to achieving a job goal, the staff will do a very manual job, which we all know will spend a lot of time and resources compared to those who do the job using digital technology. Previous research mentioned that email use a host of benefits for busy workers to support them how organized and deal their regular work in the a convenient and also one of the flexible way in the digital era (Russell et al., 2024). Work outcomes always have a difference between one and the other. It is according with the previous research statement was mentioned that WhatsApp considered the most popular messaging services application around the world, it is more than 100 countries where over the 2.5 billion is the active user of WhatsApp (Zou et al., 2023). Therefore, health professional including manager in Timor-Leste is very need to understanding and able to adapt in the digital WhatsApp use to facilitate their fast communication, and also need to help those who do not have access to these technologies to improve their future services.

Zoom/webinars/Google meet and others use

One part related to the capacity and opportunities of using a special technology medium for a zoom or a google meet was show that the study respondents that it is not used and is also strengthened by a significant p value of 0,000, although there are that they always use the technology medium. It is according with the other research was mentioned that camera is the average transformation through the era of digitalization and it is inspired by high-scalability, flexibility and strength of the learning process and services in various areas. Compared to activities in conventional ways (Liu et al., 2023). This research also according with the statement were mentioned that, the technology digital in healthcare system related to the information communication and technologies process to support the health care activities in the health facilities in the territory of the country. It is adapted by the health workers, managers, patients and family in the managing the illness and wellness based on the aim of the health facilities (Evans et al., 2024).

In fact, we are now living in an era full of activities facilitated by digital technology. Many people in this modern world are always very dependent on the technology media to support all the work in a timely manner within a few minutes, without having to finish a job. Everyone is very dependent on using media such as therefore in Timor-Leste we need health workers to make a good sense of how these media can be used to communicate quickly throughout the territory of Timor-Leste. This average will enable us to work quickly, effectively and efficiently to provide quality services to the population in Timor-Leste for the future. This is an obligation for Timorese people to know so that they can be able to compete with health workers in other countries in terms of work or even conducting quality research. Capacity building need and readiness to use digital in Timor-Leste is priority for the Timorese health workers in the any health facilities level in the country.

Conclusion

This study was indicted that majority of health professional in Timor-Leste was used the computer, internet, hand phone to support their daily activities. Event this reality, the majority of them still need to gate the professional training or capacity bulling related with the Digital technology media to improve their knowledge, attitude and psychomotor in the future to facilitate the activities day living.

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