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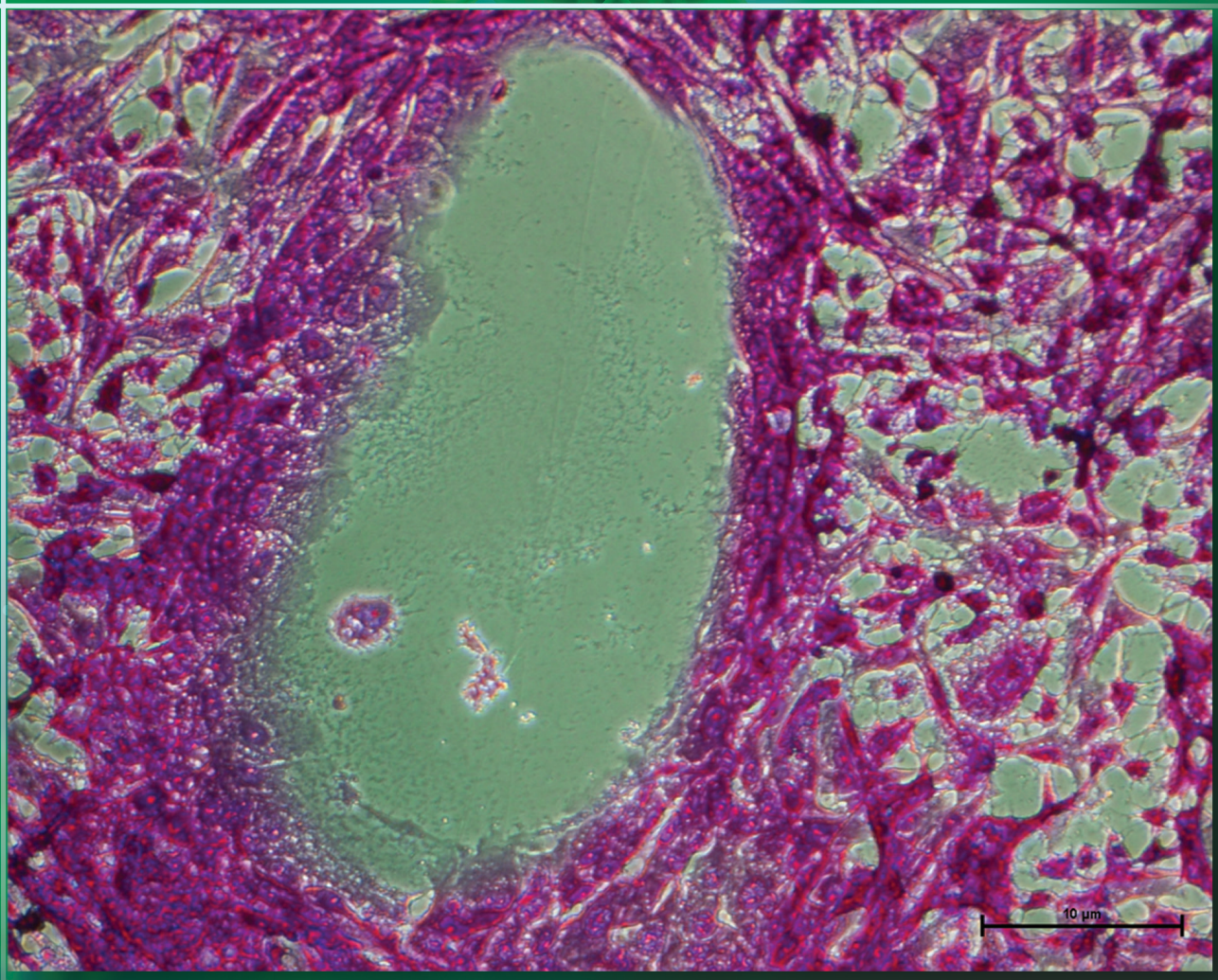

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CONTENTS

Editorial

Zoonotic viruses discovered and isolated in Malaysia: Do they pose potential risks of zoonosis?

Kenny Gah Leong Voon

Keywords: *zoonosis, viral infection, Malaysia, viral zoonotic infection*

In order to focus and prioritise its efforts under its R&D Blueprint, the World Health Organization in 2018 has developed a list of diseases and pathogens that have been prioritised for R&D in public health emergency contexts. Disease X was included in this list to represent a hypothetical, unknown disease that could cause a future epidemic.[1] Besides the pathogen that causes Disease X, several viruses such as Ebola virus, Nipah virus, Influenza virus, Severe Acute Respiratory Syndrome coronavirus (SARS-CoV), Middle East Respiratory Syndrome coronavirus (MERS- CoV) and others are being listed as potential candidates that may be associated with pandemic outbreaks in the future. Therefore, viral zoonosis that may be caused by one of these pathogens including Pathogen X in the future, is being investigated and monitored by scientists and public health practitioners around the globe.

Most scientists and policy makers claimed that viral zoonotic outbreaks are related to increased human activities interacting with wildlife.[2] Increases in population density through urbanisation and the globalisation of transportation systems have eventually led to significantly increased exposure frequency of humans to wildlife and the global mobility of humans. In addition, agricultural capacity, animal husbandry and widespread deforestation have intensified in response to the demands of industrial development, urbanisation and rising human population densities.[3,4] In fact, humans have been increasingly encroaching on wildlife habitats, which are believed to be the reservoir of most viral diseases, resulting in high spill over events to the human population.

This paper aims to recapitulate the list of viruses that were discovered and isolated in Malaysia and outline the potential threat of zoonosis among these viruses. These viruses are divided into two categories: 1) arboviruses, and 2) non-arboviruses to iterate the transmission route of these viruses.

Arboviruses

Many arboviruses are zoonotic, infecting a wide variety of arthropods, other animals including birds in their sylvatic habitats and humans as incidental hosts. Over many years, arboviruses have evolved balanced relationships with these sylvatic hosts. Thus, morbidity and mortality are rarely seen in these sylvatic animals when they are infected by arboviruses.[2] Below is the description of arboviruses that were discovered in Malaysia.

Under the family of *Flaviviridae*, several notable viruses had been isolated from *Culex* and *Aedes* mosquitoes in Malaysia. Kunjin virus (KUNV) was first isolated from *Culex alienus, C. pseudovishnui, and C. annulus* in 1966.[5] KUNV which is genetically more closely related to West Nile virus, has not be reported to be associated with any infections in Malaysia. There is also no serological study being conducted in Malaysia. Dengue virus (DENV) was first isolated from a Malaysian patient in 1954[6] and subsequently isolated in *Aedes* mosquitoes. To date, all dengue serotypes

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(DENV-1– DENV-4) have been reported in Malaysia, with potential sylvatic transmission between animals and humans.[7] Similarly, *Japanese encephalitis* virus was isolated from a patient[8] and later shown to be transmitted by *Culex* sp in Malaysia.[9] Zika virus (ZIKV) was isolated from *Aedes aegypti* in 1966 with subsequent serological prevalence indicating ZIKV had been circulating in Malaysia without any outbreaks being documented.[10,11] Tembusu virus (TMUV) was isolated from *Culex tritaeniorhynchus* mosquitoes in 1955.[12] There is a concern of TMUV being a potential zoonotic virus with serological evidence of anti-TMUV among farmers, even though TMUV is primarily associated with poultry outbreak. On the other hand, Langat virus (LGTV) is a tick-borne virus isolated in 1956 from *Ixodes granulatus* ticks of rats.[13] Although LGTV is considered avirulent in rodent and human populations, it can induce encephalitis in experimentally infected mice when the virus is inoculated intra-cerebrally.[14] However, there have been no reports of human infections. Jugra virus and Carey Island virus are novel flaviviruses isolated from *Cynopterus brachyotis* (lesser short-nose fruit bat) in 1969 and 1970, respectively.[12] To date, there are no known human diseases related to both viruses and the vectors involved in their transmission are still unidentified.

Getah virus (GETV), an *Alphavirus* under the family of *Togaviridae*, was first isolated in Malaysia in 1955 from *Culex gelidus* mosquitoes.[15] GETV is primarily reported among outbreaks in both horses and pigs. Even though there are no reports of any illnesses associated with this virus, anti-GETV antibodies have been reported in humans and this raises the concern of potential zoonotic infection of GTV, similar to TMUV. Other alphaviruses such as Bebaru virus (BEBV) and Sindbis virus (SINV) have been isolated in Malaysia, but they have not been associated with clinical infections, except a single case of mild fever attributed to SINV.[16] BEBV was first isolated from *Culex* sp and *Aedes butleri* in Rantau Panjang, Malaysia. Antibodies against Chikungunya virus (CHIKV) were detected in Malaysia in the 1970s[17,18] prior to the CHIKV outbreak in Malaysia in 1998. There is concern that CHIKV may be endemic to Malaysia due to the fact that this virus shares the same vector, *Aedes* mosquitoes with DENV.

Non-Arboviruses

Malaysia has experienced a fair share of zoonotic outbreaks from 1998-1999. The emergence of Nipah virus (NIV) in Malaysia had caused tremendous human suffering especially among those involved in pig-farming, excessive economic loss and led to a near collapse of the local swine industry.[19] NIV, under the family *Paramyxoviridae*, had been shown to have originated from the *Pteropus* sp, large fruit bats (also known as flying foxes) in Malaysia and accidentally transmitted into the swine population prior to being transmitted to humans.[19] Surveillance of NIV in Pulau Tioman in 1999, has led to the isolation of another novel paramyxovirus, namely Tioman virus (TioPV). To date, there are no known human diseases related to TioPV, even though, anti-TioPV antibodies were detected among Tioman island inhabitants.[20]

Besides TioPV, pteropid bats were found to harbour Pulau virus (PRV2P) in 1999.[21] PRV2P is a member of *Pteropine Orthoreovirus* (PRV), under the family of *Reoviridae*. Under the genus PRV, PRV3M (Melaka virus), PRV4K (Kampar virus) and PRV7S (Sikamat virus) had been isolated from Malaysian patients who presented with disease spectrum ranging from influenza-

like illness to acute respiratory distress. Chronologically, PRV3M and PRV4K were discovered in 2006 while PRV7S was discovered in 2010.[22, 23, 24] PRV infections in patients in Japan and Hong Kong had history of travel to South East Asia, further indicating that the spill over event from pteropid bats to human population is limited to specific geographical regions.

Besides fruit bats, insectivorous bats such as *Rhinoplus* sp (horseshoe bats) had been documented to harbour bat SARS-like and MERS-like coronaviruses which are genetically closely related to human SARS and MERS coronaviruses, respectively.[25] SARS-CoV2 is also claimed to have originated from bat SARS-like coronavirus isolated from *Rhinoplus affinis* (intermediate horseshoe bat).[26] The possibility of an intermediate host facilitating the emergence of the virus in humans has already been shown with civet cats acting as intermediate hosts for SARS-CoVs, dromedary camels for MERS-CoV, and pangolin hypothesised for SARS-CoV2. COVID-19 caused by SARS-Cov2 was first identified in Malaysia on 25 January 2020 with early sporadic cases. Subsequently, several waves of SARS-CoV2 infection eventually resulted in COVID-19 becoming endemic in Malaysia. On the other hand, a novel canine coronavirus, which was isolated from a hospitalised pneumonia patient in East Malaysia in 2020[27], showed its ability to cross species barrier, infecting humans. In parallel, the one-health approach zoonosis surveillance in wild and domesticated animals performed by the Department of Wildlife and National Parks and Department of Veterinary Service, respectively had reported novel animal coronaviruses and paramyxoviruses being mostly detected in wild animals in Malaysia in comparison to domesticated animals (data in PREDICT reports).

The above-mentioned viruses that were discovered and isolated in Malaysia illustrate a broad range of zoonotic viruses from different genera and families that are lurking in the dark and may pose potential risk to public health in the future. In the event if one of these viruses jumps among species and is able to be transmitted from human to human, the potential risk will become a real threat to humans. The zoonotic viruses described here are not an exhaustive list and may not be exclusive only to Malaysia. Several zoonotic viruses such as influenza virus, rabies lyssavirus and rotavirus C that were identified as causative agents in several outbreaks in Malaysia were not described here as the zoonotic origin of the viruses were not determined after the outbreaks.

In summary, Malaysia, a mega biodiversity country, appears to be a hot spot encompassing a broad range of zoonotic viruses. These viruses are naturally isolated away from humans by environmental ecosystems that provide a buffer zone. Strong evidence has linked biodiversity losses to emergence of zoonotic diseases in the human population. Protecting biodiversity is vital in protecting the environment, which is integral to Malaysia's future.

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Perception of nurses on ease of use, usefulness and system quality of electronic clinical documentation (ECD) at private hospitals in Klang Valley, Malaysia

Syakinah Anian[1,2], Mariani Ahmad Nizaruddin[3], Goventhamah Subramaniam[4], Jayanthi Marimuthu[5], Shalizah Sujak[6]

ABSTRACT

Introduction: The health information system with efficient processes and development in healthcare technology including an electronic clinical documentation (ECD) reporting draws the interest of a large number of people. Widespread expansion of the use of ECD is known to be advantageous to the health information system, however a workload is often questionable for healthcare professionals and productivity practices. The aim of this study is to analyse the perception of nurses in regards to the relationship between perceived ease of use, perceived usefulness and perceived system quality of ECD system.

Methods: The cross-sectional survey comprised of a population of nurses practising in clinical settings at private hospitals in Klang Valley, Malaysia. A total of 324 questionnaires was collected by using stratified random sampling with a 99% response rate. Smart-PLS was used to analyse the relationship between the latent variables.

Results: The perceived ease of use, perceived usefulness and perceived system quality have a significantly positive influence, resulting in a positive impact on the perception of nurses. The results of this research showed that the model's R^2 value was scored at 0.743, which indicated that 74.3% of the variance in perception on ECD was collectively explained by the three exogenous latent variables.

Conclusion: Positive perception on ECD system could be used as prediction on the acceptance by the user/nurses. This study is useful for top management and policymakers to strategise on ECD's implementation.

Keywords: *Medical record, computerised, Electronic clinical documentation, Technology Acceptance Model, Nurses*

Introduction

Recently, the healthcare sector is one of the leading industries that serves high impact quality service and treatment. With regards to this, the electronic clinical documentation (ECD) in the health information system incorporated with supporting characteristics that are manageable and faster, leading to the efficient hospital services (Ismail et al., 2015), will enable enhanced legibility, systematic storage, and immediate retrieval of notes. The system allows synchronised use of medical record by several users, improves security and privacy, and facilitates research (Hedian et al., 2018). This system is beneficial in protecting the privacy and personal rights of the patient, as well as safety, quality of care and management of health information. The consistency and capacity of this system to provide information as well as resources depend on the regular process between providers of healthcare, including physicians, nurses, allied health, and other medical stakeholders (Aldosari et al., 2018).

The new technology triggered many hopes, fears, and grumbles among healthcare professionals on the ECD system. The transformed system from the paper-based medical record to the electronic system is likely to disrupt the events or workflow in a hospital setting. There is sometimes a questionable burden of work for healthcare professionals and productivity practices (Koneko et al., 2018). Previous study by Mehrotra et al. (2016) reported various challenges and effect after implementation of this system, including ineffective workarounds, disruptions

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in continuity of care, and other electronic errors. The concern of the healthcare employee on the ECD system is whether it is an instrument that can communicate more proficiently about clinical care, or whether it has its ability to fast check medication orders and clinical resolution support which holds the key to increasingly accurate diagnoses (Hedian et al., 2018).

Therefore, it is noteworthy to determine the efficacy of the ECD system in considering the perceived ease of use, perceived usefulness and perceived system quality which substantially contribute to healthcare provider success. In the context of this study, it analysed the perception on ECD system among the nurses who play an important role in the Malaysian healthcare system.

The computerised documentation is an electronic information system used by healthcare practitioners, including nurses, to regularly record clinical information related to an individual's health. In the practice setting, this digitalised collection of information is referred to as the patient's electronic health or medical record. This includes the diagnoses, assessment data, medication orders, clinical intervention, patient's medical histories, consultations, care plan, laboratory data and patient outcomes. This record is very useful in promoting high delivery of quality care by facilitating the structured communication between nurses and other members of the healthcare team and could give largely positive impact on patient safety (Mehrotra et al., 2016).

Over the last few decades, many models and theories have been developed and tested in order to identify variables affecting the acceptance and use of technology provided to end-users. Among them, the Technology Acceptance Model (TAM) stimulated one of the most active streams of research to predict intention to use the technology and explain actual use of that technology. The goal of this study was to explore the perception of nursing staff adopting the electronic technology system in the healthcare sector in Malaysia. In order to examine the factors influencing the attitudes of nursing staff towards the application and implementation of the ECD, two variables from the Technology Adoption Model (TAM) were added. According to Davis' (1989) Technology Acceptance Model (TAM), it contributes a theoretical model-based for explaining or anticipates the factors that cause an individual to accept or reject information technology (IT). TAM is proven to be a fit model for the healthcare context to predict the attitudes towards using the computerized system by investigating the users' perceptions of IT. A study by Garavand et al. (2016) concluded that TAM showed validity, reliability, power and simplicity of IT and additional studies that were conducted showed the high ability of the TAM to demonstrate the technology adoption among staff.

In this study, two distinct variables were validated; perceived usefulness and perceived ease of use were exploited. Perceived ease of use refers to the extent or degree to which the consumer assumes or believes that the information system is simple to use and easy to use, whereas perceived usefulness refers to people's level of belief that using the system would help them achieve better job results and whether or not they will use such technology. One external variable is added to study the perception towards the quality of system. Perceived system quality is defined as a standard of system that had been measured which reflects to its own system's values and integrity including on its completeness and accuracy of data components. Figure I shows a model consisting of two TAM variables, perceived ease of use and perceived usefulness as prediction variables in addition to the other

factor, perceived system quality, which has shown its importance in influencing the perception of information system. Thus, this study developed the hypothesis:

- *H1 = Perceived ease of use has a significant and positive effect on the perception of nurses on electronic clinical documentation.*
- *H2 = Perceived usefulness has a significant and positive effect on the perception of nurses on electronic clinical documentation.*
- *H3 = Perceived system quality has a significant and positive effect on the perception of nurses on electronic clinical documentation.*

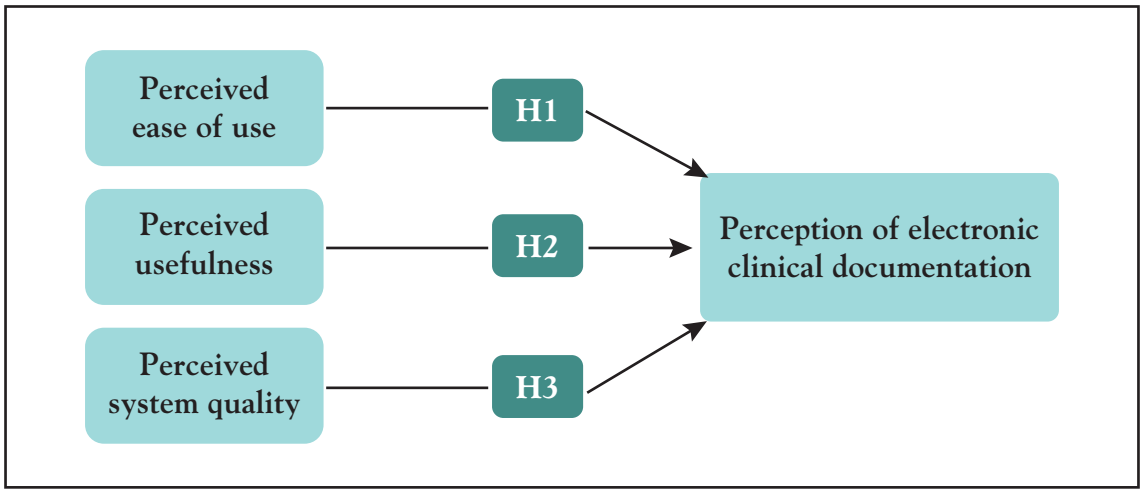

Figure I: Conceptual framework of Perception of Electronic Clinical Documentation

Methodology

Study setting

This study was conducted in three private hospitals within Klang Valley. The hospitals involved in the study were considered as specialist hospitals and tertiary private hospitals. These hospitals had been identified and certified nationally by the Malaysian Society for Quality in Health Care and internationally by the Joint Commission International. The following criteria were used to determine the hospitals:

- *The hospitals were using the same Clinical Information System*
- *The hospitals were in the transitional phase from paper-based documentation to electronically-based documentation*

Participants

The target population of participants included all nurses with more than two (2) years working experience at target hospitals and were experienced in using ECD in their clinical practice during the data collection phase from March 2020 till June 2020. Stratified random sampling was used to select a total sample size for the study. A group of nurses was chosen based on their specialty department, and then participants were

randomly selected in each department. A total of 324 nurses took part in the study by following the guidelines (Krejcie & Morgan Table, 1970). The nurses were required to return the survey after completion within data collection period.

Questionnaire

The items in the instruments were selected from this instrument to suit the respondents' needs according to the research objectives. On a 5-point Likert scale, there were 34 items in the form of a measurement scale that instructed the nurses to mean "1 = strongly disagree" to "5 = strongly agree." The first section consisted of six questions that identified the respondent's demographic information. The second section included 28 questions that focused on the factors that influence nursing students' perception of ECD, such as perceived ease of use, perceived usefulness, perceived system quality, and intention to use the ECD.

Data analysis

The structural equation modelling was used to study the correlation between the factors. Structural equation modelling analysis (SEM) using SmartPLS ver. 2.0M3 is a statistical technique used for analysing structural models which contain latent variables (Hair et al., 2020, p. 109). Two types of models can be analysed using SEM: a measurement model and a structural model. The measurement model evaluates the extent to which the predicted relationships among the variables is reflected in the relationships among the observed variables. The structural model measures the extent of the relationship among latent constructs as well as the relationship among other measured variables. If the data from the hypothesized model and observed models match, the structural equation model can be used to explain the hypothesized model. The nature of the research hypothesis provides the rationale for the use of structural equation modelling as a data analysis technique. This study focused on the structural model and tested the validity of the hypothesized structural model compared to the observed model.

Results

Nurses' demographic information

Table I shows the descriptive analysis of the demographics of the study participants. Among the respondents, 311 (96%) of the nurses who responded to this survey were female, while 13 (4%) of the respondents to the survey were male. The age of respondents was widely distributed with 161 (49.7%) of the nurses that took the survey for this study between 20 to 29 years, while 128 (39.5%) of nurses between 30 to 39 years. The number of nurses between 40 to 49 years was 26 (8%) and aged between 50 to 59 years was 9 (2.8%) respondents. Analysis of the nurses' educational level revealed that 287 (88.6%) of the respondents to the survey were graduates with Diploma certificate and recognised as Staff Registered Nurse (SRN), 33 (10.2%) of the respondents of this survey were graduates with Bachelor degree, while 4 (1.2%) of the respondents are Master/PhD holders. Work experience in nursing practice ranged from less than five to more than 25 years. The largest proportion of nurses, 124 (38.3%) had practiced within 2 to 5 years, 108 (33.3%) had worked within 6 to 10 years, 49 (15.1%) had worked within 11 to 15 years, 24 (7.4%) had worked within 16 to 20 years, 11 (3.4%) of the nurses who responded to this survey had worked for 21 to 25 years and lastly 8 (2.5) of nurses who responded to this survey had worked more than 25 years.

Table I: Nurses' demographic information

Characteristics	(N = 324)	%
Gender		
Male	13	4.0
Female	311	96.0
Age (years)		
20 – 29	161	49.7
30 – 39	128	39.5
40 – 49	26	8.0
50 – 59	9	2.8
Education level		
Diploma	287	88.6
Bachelor	33	10.2
Master/PhD	4	1.2
Years of experience in working		
2 – 5	124	38.3
6 – 10	108	33.3
11 – 15	49	15.1
16 – 20	24	7.4
21 – 25	11	3.4
More than 25	8	2.5
Duration of computer usage (years)		
2 – 5	141	43.5
6 – 10	119	36.7
11 – 15	29	9.0
16 – 20	16	4.9
20 – 25	9	2.8
More than 25	10	3.1
Formal computer training		
Yes	250	77.2
No	74	22.8

Evaluation of outer measurement model (SEM)

The purpose of the outer measurement model is to evaluate the reliability, internal accuracy, and validity along with unobserved variables of the observed variables. Consistency assessments are based on single reliability measures observed and constructed, while convergent and discriminant validity are used for validity evaluation. Observed variables with an outer loading of 0.7 or greater are believed to be greatly acceptable, while the outer loading with a value less than 0.7 should be discarded (Hair et al., 2020).

The cut-off value approved for the outer loading was 0.7 for this analysis. The outer loadings varied between 0.853 and 0.969 from Table II. For internal consistency assessment of the construct reliability, Cronbach's alpha and Composite Reliability (CR) were used. Nevertheless, CR is thought to be a better assessment of internal accuracy compared to the alpha of the Cronbach, since it maintains the consistent loadings of the variables observed. The Cronbach's alpha and CR (Table II) was greater than 0.80, for all constructs. Therefore, the Cronbach alpha and CR showed that the scales were reasonably accurate and showed that all the latent construct values exceeded the minimum threshold level of 0.70. The Average Variance Extracted (AVE) of each latent construct was determined to verify the convergent validity of the (Hair et al., 2020). The latent constructs in the model should take the lowest 50 percent of the variance from the variable observed. This implies, therefore, that the AVE should be above 0.5 for all constructs. Table II shows that all AVE values were greater than 0.5, so for this study model, convergent validity was confirmed. The convergent validity and good internal consistency of the measurement model were verified by these findings.

The next attempt was the discriminatory validity of the latent constructs. Discriminant validity determines that the manifest variable in any construct is distinct from other constructs in the path model, where the cross-loading value in the latent variable is greater than in any other construct (Hair et al., 2020). The latent variable correlation and cross-loadings were used to evaluate the discriminant validity. The standard proposed is that the construct does not display the same variance as any other construct that is more than its AVE value. Table III shows that the cross-loading of all the variables observed was more than the inter-correlations of the construct of all the other variables observed in the model. These results therefore validated the cross-loading evaluation criteria and offered an acceptable validation of the discriminatory validity of the measurement model.

Table II: Construct Reliability and Validity

Main construct	Items	Loadings	Cronbach's Alpha	CR[a]	AVE[b]
Perceived ease of use	PEOU-1	0.899	0.949	0.962	0.834
	PEOU-2	0.939			
	PEOU-3	0.942			
	PEOU-4	0.929			
	PEOU-5	0.853			
Perceived usefulness	PU-1	0.873	0.979	0.982	0.833
	PU-2	0.894			
	PU-3	0.914			
	PU-4	0.940			
	PU-5	0.915			
	PU-6	0.934			
	PU-7	0.945			
	PU-8	0.934			
	PU-9	0.909			
	PU-10	0.875			
	PU-11	0.902			
Perceived system quality	PSQ-1	0.884	0.970	0.975	0.827
	PSQ-2	0.914			
	PSQ-3	0.886			
	PSQ-4	0.926			
	PSQ-5	0.886			
	PSQ-6	0.937			
	PSQ-7	0.926			
	PSQ-8	0.918			
Perception on nurses toward electronic clinical documentation	PN-1	0.961	0.975	0.981	0.929
	PN-2	0.963			
	PN-3	0.964			
	PN-4	0.969			

[a] *Composite reliability (CR), (square of the summation of the factor loadings)/{(square of the summation of the factor loadings)þ(square of the summation of the error variances)}.*

[b] *Average variance extracted (AVE), (summation of the square of the factor loadings)/{(summation of the square of the factor loadings)+(summation of the error variances)}.*

Table III: Cross-Loading of all variables

	PEOU	PU	PSQ	PN
PEOU-1	**0.899**	0.731	0.668	0.696
PEOU-2	**0.939**	0.793	0.713	0.728
PEOU-3	**0.942**	0.792	0.717	0.730
PEOU-4	**0.929**	0.784	0.735	0.701
PEOU-5	**0.853**	0.672	0.626	0.576
PU-1	0.710	**0.873**	0.723	0.723
PU-2	0.753	**0.894**	0.735	0.748
PU-3	0.764	**0.914**	0.788	0.774
PU-4	0.778	**0.940**	0.811	0.843
PU-5	0.786	**0.915**	0.803	0.778
PU-6	0.766	**0.933**	0.793	0.766
PU-7	0.777	**0.943**	0.794	0.811
PU-8	0.783	**0.935**	0.786	0.794
PU-9	0.722	**0.909**	0.779	0.770
PU-10	0.733	**0.875**	0.769	0.720
PU-11	0.738	**0.902**	0.763	0.780
PSQ-1	0.671	0.740	**0.883**	0.683
PSQ-2	0.707	0.760	**0.814**	0.700
PSQ-3	0.664	0.726	**0.886**	0.656
PSQ-4	0.698	0.808	**0.925**	0.755
PSQ-5	0.624	0.715	**0.886**	0.660
PSQ-6	0.716	0.826	**0.937**	0.765
PSQ-7	0.719	0.810	**0.926**	0.779
PSQ-8	0.717	0.797	**0.918**	0.752
PN-1	0.726	0.819	0.775	**0.961**
PN-2	0.727	0.817	0.761	**0.963**
PN-3	0.724	0.819	0.775	**0.964**
PN-4	0.735	0.818	0.747	**0.969**

[a] *Bold values are loadings for each item that are above the recommended value of 0.5; and an item's loadings on its own variable is higher than all of its cross-loadings with other variables.*

Evaluation of inner structural model

The outcomes of the Inner Structural Model observe the predictive significance of the model and the interaction between the constructs. The coefficient of determination (R^2), the coefficient of path (β value) and the T-statistic value, the size of the effect, the predictive relevance of the model (Q^2) and the index of goodness of fit (GOF) are key standards for evaluating the internal structural model.

Measuring the Value of R^2

The coefficient of determination determines the total size and variance of the effect explained in the endogenous structure of the structural model and is thus a measure of the predictive accuracy of the model. The inner path model for the endogenous latent construction was 0.743 in this analysis. This suggests that the three separate constructs provide a substantial explanation of 74.3% of the variation in nurses' perception of electronic clinical documentation, meaning that about 74.3% of the change in the perception of nurses were due to three latent constructs in the model. According to Hair, Hult, et al. (2017), an R^2 value of 0.75 is considered substantial, an R^2 value of 0.5 is regarded as moderate, and an R^2 value of 0.26 is considered as weak. Hence, the R^2 value in this study was substantial.

Estimation of Path Coefficients (β) and T-statistics

The path coefficients in the PLS and the standardised β coefficients in the regression analysis were similar. The importance of the hypothesis was checked by the β value. The β denotes the predicted variance in the dependent construct for the unit variation in the independent construct(s). The β values of each path in the hypothesised model have been determined, the higher the β value, the more the substantial effect on the endogenous latent construct. β value is always standardized path coefficients. Given standardization, path weights therefore vary from -1 to +1. Weights closest to absolute 1 reflect the strongest paths. Weights closest to 0 reflect the weakest paths. However, the β value had to be verified for its significance level through the T-statistics test. The bootstrapping procedure was used to evaluate the significance of the hypothesis. To test the significance of the path coefficient and T-statistics values, a bootstrapping procedure using 324 subsamples with no sign changes was carried out for this study as presented in Table IV.

Table IV: Path Coefficient and T-statistics

Hypothesized path	Standardized Beta	T-statistics[a]	Decision
Perceived ease of use➸Perception of nurses	0.126	1.756*	Supported
Perceived usefulness➸Perception of nurses	0.549	6.290***	Supported
Perceived system quality➸Perception of nurses	0.230	2.449**	Supported

[a] *t-values for two-tailed test*

** 1.65 (sig. level 10%)*

*** 1.96 (sig. level=5%)*

**** t-value 2.58 (sig. level=1%) (Hair et al., 2011)*

In H1, the researcher predicted that the perceived ease of use would significantly and positively influence perception of nurses on electronic clinical documentation. As predicted, the findings in Table IV confirmed the perceived ease of use on the perception of nurses toward ECD (β = 0.126, T = 1.756). Hence, H1 was supported. Meanwhile, when observing the direct and positive influence of perceived usefulness on perception of nurses toward electronic clinical documentation (H2), the findings from Table IV endorsed that the perceived usefulness high positively influenced perception on nurses (β = 0.549, T = 6.290), and confirmed the H2. The influence of the perceived system quality on perception on nurses was also positive and significant (β = 0.230, T = 2.449), showing that H3 was supported. The greater the beta coefficient (β), the stronger the effect of an exogenous latent construct on the endogenous latent construct. Table IV showed that the perceived usefulness had the topmost path coefficient of β = 0.549 when compared to other β values in the model, which showed that it had a greater value of variance and high effect with regard to affecting the perception of nurses toward the ECD. Whereas, the perceived ease of use had the least effect on perception of nurses with β = 0.149.

Measuring the Effect Size (f^2)

The f^2 is the degree of impact of each latent exogenous construct on the latent endogenous structure. If an independent construct is removed from the path model, it changes the value of the coefficient of determination (R^2) and determines whether the removed latent exogenous construct has a major effect on the value of the latent endogenous construct. The f^2 values were 0.35 (strong effect), 0.15 (moderate effect), and 0.02 (weak effect) (Cohen, J., 1988). Table V shows the f^2 from the SEM calculations. The effect size for perceived ease of use, perceived usefulness and perceived system quality on perception of nurses on the ECD were 0.475, 0.469 and 0.599, respectively. Hence, according to Cohen's (1988) recommendation, the f^2 of all three exogenous latent constructs on perception of nurses had strong effect on the value of R^2. Furthermore, all the three independent latent constructs in this study participated relatively to the greater R^2 value (74.3%) in the dependent variable.

Table V: Effect size for perceived ease of use, perceived usefulness and perceived system quality on perception of nurses on the ECD

Exogenous latent variable	Effect size f^2	Total effect
Perceived ease of use	0.475	Strong
Perceived usefulness	0.469	Strong
Perceived system quality	0.599	Strong
Perception of nurses	0.605	Strong

Value effect size

0.02 Small

0.15 Medium

0.35 Large

Predictive Relevance of the Model (Q^2)

Q^2 statistics are used to measure the quality of the PLS path model, which is calculated using blindfolding procedures, and cross-validated redundancy was performed. The Q^2 criterion recommends that the conceptual model can predict the endogenous latent constructs. In the SEM, the Q^2 values measured must be greater than zero for a particular endogenous latent construct (Hair et al., 2020). From the analysis, it showed that the Q^2 values for this study model was equal to 0.743, which was higher than the threshold limit, and supports that the path model's predictive relevance was adequate for endogenous construct.

Goodness-of-Fit Index (GOF)

GOF is used as an index for the complete model fit to check that the model properly describes the empirical evidence. The GOF values are between 0 and 1, where the values of 0.10 (small), 0.25 (medium) and 0.36 (large) imply the global validation of the path model. A good fit model indicates that the model is parsimonious and plausible (Henseler et al., 2016). The GOF is calculated by using the geometric mean value of the average communality (AVE values) and the average R^2 value(s), and the GOF of the model is calculated by Equation 1.

Equation 1

$$GOF = \sqrt{\text{Average } R^2 * \text{Average communality}}$$

It was determined from Table VI that the GOF index for this study model was 0.796, which indicates that empirical data is adequate for the model and has important predictive power compared to baseline values.

Table VI: Goodness-of-fit index calculation

Construct	Ave	R^2
Perceived ease of use	0.834	
Perceived usefulness	0.833	
Perceived system quality	0.827	0.743
Perception of nurses	0.929	
Average values	0.856	
GOF	0.796	

Correlation Coefficient of Latent Variables

Table VII displays the significance of the latent variable correlation coefficients. It indicates that there was a strong correlation between the latent exogenous construction and the latent endogenous construction. In line with the complete study of the measurement models and the structural model, it was determined that both models had been confirmed. Both of the hypotheses were statistically valid and were thus accepted. The results of this study support a richer and accurate picture of the factors affecting the perception of nurses on ECD at private hospitals in Malaysia

Table VII: Latent Variable Correlations

	Perceived ease of use	Perceived usefulness	Perceived system quality	Perception on nurses
Perceived ease of use	1.000			
Perceived usefulness	0.828	1.000		
Perceived system quality	0.759	0.852	1.000	
Perception on nurses	0.754	0.848	0.793	1.00

Discussion

The adoption of ECD system has been widespread over recent years with the promise of more efficiency of information sharing among the healthcare staff. In addition, in the transition from paper-based to electronic health record, it was hoped the new phase would lead to improved patient safety and information flow and access to knowledge in a short duration of time (Baumann et al., 2018). This study used TAM factors; perceived ease of use and perceived usefulness as predictive factors that may lead to the ECD user positive acceptance. An additional variable used in this study was perceived system quality to measure the perception of the system from the perspective of new users. The findings of the study supported the theory that the majority of nurses were in agreement that the ECD system is integrated with their daily work. This is also supported by the findings of other studies in the similar area, where the positive perception of these two factors in TAM model showed that a positive relationship existed between them (Tubaishat, 2017).

Additionally, the nurses stated that the information provided by the ECD system makes their work easier as they have access to the information where and when they need it, they can find all the constantly updated information they need. They consider that the data they register are essential for the care of patients. This result showed that the system tends to be more useful to their work.

On the other hand, the outcomes of this study showed that 77.2% of the nurses had attended the formal computer training for the ECD system. This clearly suggests that with the help of adequate computerized electronic healthcare system, the implementation of ECD system could be acceptable and effective among the nurses in providing quality healthcare in the hospitals. According to Aldosari et al. (2018) and Baumann et al. (2018), the introduction of electronic record system into a clinical setting must be carefully considered with effective training to enable staff to be comfortable with the new system. The perception of increase in workload may cause end users to be unlikely to accept any electronic clinical documentation system. Hence, with a proper computerized training given to the users, the hope is in the long run, with full transition from paper to electronic records and time for the nurses to adapt, the workflow will improve and documentation time will decrease.

According to previous studies, the U.S. federal government has enacted legislation with the aim of promoting the "meaningful use" of electronic health record (EHR) systems by health providers and medical practitioners, and approved the idea of federal government providing required funds necessary for compliance with the "meaningful criteria and advanced patient involvement in the system". Considering nurses' needs of providing high quality healthcare information, user-friendly systems and adequate training would improve nurses' acceptance towards computerization. They can be considered as key factors in affecting the planning and implementation of EMR (J Johnson III, 2016).

In addition, the findings also further supported the TAM factors developed by Davis (1989), as they suggested a positive correlation between perceived ease of use and perceived usefulness. It claimed that the perceived usefulness and ease of use had a positive impact on nurses' perception of the use of the ECD system. It cannot be argued that ECDs have had a major positive impact on patient care. At present, the clinical information system has become a critical foundation for transforming health care and is a key benchmark for enriching the quality of health care, optimising patient management and expanding excellent outcomes in the delivery of health care. With the introduction of innovative methods and strategies in the field of clinical information systems, the best electronic medical record systems are being created to address the current needs of patients and healthcare organisations. Some of the latest and advanced features of the ECD system include securing patient information by role-based access, which enables only approved personnel to access the system in order to display patient records and use data for document access control auditing.

Conclusion

This research established and determined that nurses had a positive attitude towards perceived ease of use and perceived usefulness in terms of perception of the ECD system. The use of ECD in this hospital environment helps to ensure the effectiveness of clinical treatment and the protection of patients. The system is definitely an improvement over paper-based records when it comes to preserving reliable and accurate patient information, such as vital medical information. Moreover, the emergence of electronic clinical records and a standardised record system would allow healthcare facilities to improve the quality of care and would greatly benefit patients, especially those with significant health problems. Demographic and device quality characteristics of users have also shown their significance as variables used to predict nurses' perception of the ECD system.

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An in-depth understanding of heartfulness meditation

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ABSTRACT

Background: Heartfulness meditation aims to help individuals connect to their inner self to attain peace and a balanced state of mind. Previous studies have been conducted to gain mechanistic insights into the effects of Heartfulness meditation on bodily and cellular functioning as well as in enhancing one's psychological, emotional and social well-being. However, most of the research is quantitative in approach, and has not been able to capture the intricacies of human lived experiences involved during the process of meditation. This qualitative study aims to understand the lived experiences of Heartfulness practitioners.

Method: A thematic analysis strategy was utilized to discover the themes which represented the meaning behind the reported narrative experiences of Heartfulness practitioners. Twenty-five Heartfulness meditation practitioners were recruited at a Heartfulness retreat at the International Heartfulness Centre in Hyderabad, India to gain their insights.

Result: The current study found that for Heartfulness practitioners, positive changes become gradually visible with regular practice. The process of Heartfulness meditation was found to directly influence physical, psychological, social, cognitive, as well as spiritual benefits.

Conclusion: In-depth lived experiences were explored which add personalized human elements to the field of Heartfulness meditative practice. Implications and limitations of the current study were also addressed and suggestions for future research were discussed.

Keywords: *qualitative, biopsychosocial, heartfulness meditation, well-being*

Introduction

Although the mind has been the focus of current studies in multiple domains, the heart has been universally accepted as the seat of divinity, epitome of intelligence, love and wisdom since time immemorial. Studies are acknowledging the foremost function of the heart in the feedback loop between the heart and the brain (McCraty & Zayas, 2014; Snyder, Lopez, Edwards & Marques, 2009).

Making recent breakthroughs in science is Heartfulness meditation which is inspired by yoga and yogic traditions to promote self-awareness (Patel & Pollock, 2018). Heartfulness meditation focuses on meditating on the heart where human life is centred. Regular meditation on the heart is perceived to holistically affect the lymphatic system (Chandra, 1979; Daugherty, 2014, Patel & Pollock 2018). In addition, the factor that differentiates Heartfulness from other meditative practices is the element of yogic transmission (Arya et. al., 2018).

Research to date on Heartfulness meditation has focused on utilizing quantitative approaches to measure physiological changes such as heart rate variability, respiratory rate and blood pressure (Arya et. al., 2018), quality of sleep (Arya et. al., 2018), improvement in electroencephalogram (EEG) signal and functional magnetic resonance imaging (fMRI) frequencies from the heart to the brain (Arunachalam, Jagatheesaperumal & Sundaram, 2020). Besides, quantitative measures were also used to understand the role of Heartfulness meditation on psychological aspects such as depression, anxiety, and stress (Singh, Mohan & Kumar, 2011), gratitude (Amarnath et. al., 2019), and loneliness and sleep quality (Thimmapuram et. al., 2020). However, these mechanistic approaches could not adequately

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capture the states of consciousness of Heartfulness practitioners. This led to the current qualitative study to explore the role of Heartfulness meditation through personal lived experiences.

Studies have been conducted to understand the effects of Heartfulness meditation on a physical level. For example, heart rate variability (HRV) is a psycho-physiological factor that is found to be an indicator of lifespan and cardiac health (Arya et. al., 2018). Studies demonstrated that daily 30-minute sessions of Heartfulness likely regulates heart rate variability, respiratory rate and blood pressure in both long term-meditators and beginners (Arya et. al., 2018).

On a cellular level, a 12-week intervention study on Heartfulness Meditation for healthcare professionals demonstrated an increased telomere length in younger populations from the experimental group which brought prospective improvement of burnout and emotional wellness (Thimmapuram et. al., 2017). Another study done by Thimmapuram et. al., (2019) demonstrated that heartfulness meditation was associated with substantial decrease in emotional exhaustion, in those aged 30 to 50 years. Besides, an 8-week Heartfulness Meditation program conducted on patients that were being treated for chronic insomnia demonstrated statistical improvements in the scores of the Insomnia Severity Index (ISI). The study supported Heartfulness Meditation as a viable option in the combination of treatment options for chronic insomnia (Thimmapuram et. al., 2020).

A study of the effects of six weeks of Heartfulness meditation on brain activity demonstrated that Heartfulness Meditation was seen to yield a state of mind that was distinct from effortful problem solving (Gupta, 2018). In addition, a 24-week Heartfulness self-development program demonstrated an improvement in psychological stability, moral reasoning, self-efficiency and positive attitude among participants (Arya et. al., 2018). Amarnath et. al., (2019) even found that Heartfulness meditation cultivated gratitude. Unique to Heartfulness meditation is the rejuvenation (i.e. cleaning) process and it was found to improve quality of sleep by minimizing negative thoughts (Arya et. al., 2018). Heartfulness meditation was also found to reduce depression, anxiety, and stress symptoms and was beneficial for the welfare of individuals undergoing psychological distress, post-traumatic stress disorder (PTSD) and emotional turmoil (Singh, Mohan & Kumar, 2011).

A study conducted by Cashwell, Bentley and Bigbee (2007) described how Heartfulness aided in the prevention of depersonalization of counsellors towards their clients. Heartfulness was also instrumental for achieving higher levels of self-compassion and gratitude in relationships (Amarnath et. al., 2019). Besides, the effects of remote Heartfulness meditation have demonstrated an improvement in loneliness and sleep quality among physicians and advanced practice providers in the course of the COVID-19 pandemic in the United States of America (Thimmapuram et. al., 2021). With the supportive background of previous quantitative studies, the current study aimed to understand the personal lived experiences of Heartfulness practitioners from a qualitative perspective.

Methods

Study design, setting and sample

A basic qualitative research design was utilized to understand how Heartfulness practitioners structured their experience (Merriam, 2009). An in-depth interview technique was used to gather detailed, precise

and meaningful insights of the participants' experience and encounters (Minikel-Lacocque, 2018).

A purposive sampling method was used in this study where announcements were made at a heartfulness retreat at the International Heartfulness Centre in Hyderabad, India inviting active practitioners from around the world to share their lived experiences. A data saturation point was achieved after 25 participants were interviewed. The international participants came from 7 countries – India, the United States of America, Malaysia, New Zealand, Portugal, Fiji Island, and France (Table I). All participants met the following inclusion criteria: (i) meditators who were practising Heartfulness meditation for at least 1 hour a day, for 6 days a week for a period of at least 1 year (Amarnath et al., 2017; Patel & Pollock, 2018), (ii) were at least 18 years old and above, and (iii) possessed the ability to converse in English at a moderate level. The exclusion criteria for the participants were: (i) participants who practised any other form of meditative practices apart from Heartfulness Meditation. The exclusion criteria stated is to ensure the objective of the research was fully met by reducing confounding factors.

Table I: Participants' Demographic Information

Participant	Age	Gender	Religion	Country
Anu	47	F	Hindu	India
Jane	42	F	Non-religious	Fiji Island
Amanda	25	F	N/A	USA
Aaron	51	M	N/A	France
Daisy	40	F	Hindu	Fiji Island
Naida	51	F	-	New Zealand
Abby	52	F	-	New Zealand
Oscar	40	M	-	Portugal
Tan	39	M	Buddhist	Malaysia
Dhruv	56	M	Hindu	USA
Onir	56	M	-	USA
Asad	41	M	-	USA
Arith	57	M	-	USA
Ojal	22	F	-	India
Jones	22	M	-	USA
Shail	38	F	Hindu	USA
Sonu	41	M	-	USA
Anay	22	M	Hindu	India
Asad	30	M	Hindu	India
Aish	70	F	Hindu	India
Prasad	29	M	Hindu	India
Ovi	23	F	Hindu	India
Mary	38	F	-	Portugal
Kelly	58	F	-	New Zealand
Lao	49	M	Buddhist	Malaysia

Ethical considerations

Ethical approval was obtained from the Joint Research Ethics Committee of the International Medical University (BPS I-01/17(28)2019), as well as the Heartfulness Institute in India to conduct the research.

Interview process

A screening process was conducted before each interview to ensure participants met the inclusion criteria. An informed consent was provided to participants with every interview session being recorded with an audio recorder. Data collection was obtained from at least two in depth interviews with each participant.

Trustworthiness of data

During data collection and analysis, member check was done to authenticate the accuracy of the data obtained. A constant reflection was conducted using the bracketing technique to ensure the validity of the data and to manage any researcher biases. The data obtained was triangulated by the researchers to attest the uniformity of all the emerging codes and themes from all participants.

Data collection

Following the announcements to participate in the research at the Heartfulness retreat, participants who consented were screened, and those who met the inclusion criteria were interviewed. The data collection was carried out in February 2020.

Data analysis procedure

Thematic analysis was used to analyse, classify and present themes that are related to the data (Braun & Clarke, 2006) through the six stages as shown below.

1. The researcher actively examined the data through repetitive reading to spot emerging patterns. Crucial attention was paid to both the latent and lucid meanings that transpired from the transcription.
2. Preliminary codes were generated in a systematic fashion across the entire data set with mindful consideration to prevent any biases.
3. The analysis re-focused on a broader level to sort various codes into possible themes. A thematic map was drawn to organize codes into its themes and subthemes and all codes were retained at this stage for further analysis before discarding any irrelevant codes.
4. Internal homogeneity and external heterogeneity were considered at this stage by reviewing and thoroughly reading the codes within each theme, to ensure that data within the themes were jelled together while maintaining the clarity between the themes (Merriam, 2009).
5. All coded data extracts for each theme were articulated with a description.
6. A conclusive analysis was done by repeatedly vetting the themes before the complete write up of the study.

Results

Six common themes emerged suggesting that the lived experiences of the Heartfulness meditation practitioners corresponded to the biopsychosocial model (physical, psychological and social experiences) with added factors of cognitive and spiritual experiences. The themes are further elucidated in Figure I.

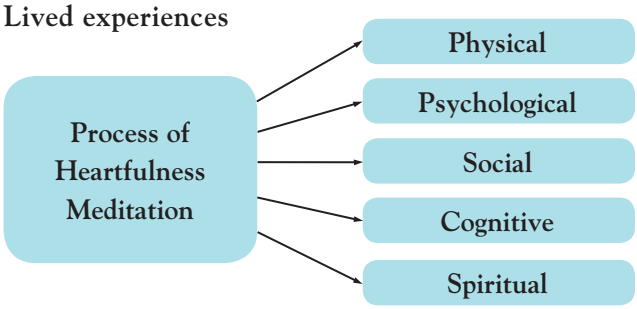

Figure I: Themes pertaining to lived experiences of Heartfulness practitioners

Theme 1: Process of Heartfulness Meditation

Hailing from various backgrounds and beliefs, participants aspired to seek deeper into the essence of their own lives:

"When I started heartfulness, it was a feeling of coming home… heartfulness is the one until now that allows me to be very well aligned and it seems like the part of me that was searching outside, now it wants to search inside". P1/I1/Line 55-58

The major practices in Heartfulness meditation were also acknowledged by the practitioners:

"I would say it's a scientific and practical method for connecting with your heart, which is really where the decisions happen. So might as well make it conscious. It took me about two weeks to really focus on the heart because we're not wired for that. We are always here (pointing to the head). So, I tell people, give it time…" P2/I1/Line 400-406

The aspect of yogic transmission that was known to be the signature of heartfulness was also explained by the participants:

"I relate it to universal energy. We have energy all around us, it's just that we don't feel it. It's like we have air around us, we don't feel it and when you put the fan on, and you feel it. Similarly, when this energy is channelled, through the guide or through the trainers, you actually feel that something is entering your system. And that energy is what I refer to as transmission within the system". P12/I1/Line 123-125

Practitioners also mentioned about the experience of the inner connection which they do as part of the heartfulness practice describing it and its effect as follows:

"So, the science behind that is, you get into a prayerful state at night and then your subconscious maintains that overnight. So, you're starting to reprogram your subconscious brain into being in a more divine state overnight as opposed to watching a horror movie and then carrying that overnight". P11/I1/Line 12-16

Theme 2: Physical Experiences

Most practitioners stated that Heartfulness has brought positive changes to their biological or physical self.

Dhruv stated that he was suffering from intense sciatic pain for 20 years and the pain remained post-surgery. However, he managed to deal with the pain through the process of meditation:

"When you're going through pain, in the process of fighting it and feeling uncomfortable with it, you make it worse. So, the spiritual practice through Heartfulness, … if you follow it diligently, builds up a lot of mental strength giving you the ability to deal with all these things and accept it. It may not go away, but you can accept it". P10/I1/Line 217-225

Heartfulness was seen to create a physical change not only in the realms of physical pain and body sensations but also in strenuous physical activity, such as sports. As such, Anay who finds his passion in playing football, stated that his physical self has changed while carrying out strenuous activities:

"I play football and though it's a very rough physical activity, there is always an inner softness and lightness in me while I play it, which makes me feel more confident and score better in my games, which I totally attribute to the benefits of heartfulness". P18/I1/Line 80-83

Most practitioners also stated that they saw a shift in their energy capacity for the day when they meditated. One participant stated that Heartfulness acted as a buffer:

"I don't have as much stress… I attribute that to meditation… it doesn't mean that I don't have the same amount of responsibilities as other people, it just means that I am not so stressed out about those things and heartfulness has really helped me in a physical well-being perspective". P7/I1/Line 120-124

In brief, most participants stated that their physical experiences were positive after heartfulness meditation, attributing it to their mental state which improved with the meditation.

Theme 3: Psychological Experiences

Participants also stated that they experienced psychological changes. Most participants highlighted that heartfulness helped them develop the sensitivity to be more responsive to life events as they changed from a reactive mind to a responsive heart which also made them more compassionate in nature:

Jane states that:

"Before getting into heartfulness meditation, I used to react very abruptly to turn of events but now, I'm able to distance myself and view it through the right perspective". P2/I1/Line 65-66

Practitioners also stated how heartfulness meditation keeps them centred in life. As such, Asad discovered that he was able to differentiate between his needs and desires which gave him a sense of direction in life:

"It allows me to be more authentic with myself, it allows me to sense more of what life is wanting to live through me, instead of what I want from life. Of course, I have needs and desires, but through heartfulness, it seems like I'm entering in an alignment with life itself and it's easier". P19/I1/Line 555-558

Finally, Onir stated that Heartfulness meditation has given him the wisdom to recognize that happiness is very transient and that the goal of life is about fulfilment rather than happiness:

"The more you try and search for happiness, the more you want it. The game never ends, so then what wisdom finally tells you is it's not happiness that you're searching for but fulfilment. While happiness is external to you that you feel by getting it, fulfilment is something that you get within yourself only through a spiritual practice and when you get this fulfilment …, you're not looking for happiness anymore". P11/I1/Line 410-418

In brief, participants gained psychological awareness and managed to successfully integrate what they learned into their own lives.

Theme 4: Social Experiences

A consistent pattern was found among all participants encompassing elements of compassion and kindness that was reflected in their day to day living. Aaron expressed his sentiments, stating that:

"The touch of heartfulness has helped me respond with more love, openness and be less judgmental of people". P4/I1/Line 69-72

In line with being less judgemental, Dhruv stated that Heartfulness meditation has given him the acceptance, making him more patient with his daughter's learning styles; he stated that:

"If you're able to be patient and then understand how your child learns and all that, it creates a much more healthier family environment and I think that wouldn't have been the case if this (Heartfulness meditation) wasn't a part of it". P10/I1/Line 500-502

The concept of universal brotherhood was also highlighted in this theme. Jones stated that:

"Within the heartfulness community, people are a lot more relaxed and friendlier, which also gives you that community aspect, it gives me a sense of belonging". P15/I1/Line 123-130

Theme 5: Cognitive Experiences

Participants stated that their thinking ability improved with the practice while some shared that their awareness had expanded.

Dhruv stated that he used to get very stressed at work and could not find a way to de-stress. He would even wake up in the middle of the night with vigorous thoughts, but this meditation was so simple that he acquired the ability to observe his mind without getting affected by it. He stated with a sense of joy that:

"The ability to detach from stressful thoughts during meditation was found to be liberating because over time it became clear that, if I am able to detach myself from these thoughts during meditation, then I can detach myself from these thoughts during my day to day life". P10/I1/Line 109-112

Arith on the other hand noticed that he began seeing life in a broader perspective after starting meditation.

"I found that all these things that happened around me was put into my life for me to grow be it any situation …, there has been a real good change in the way I start to look at things after this practice". P13/I1/Line 344-345

Understanding their own cognitive experiences gave the participants a good outlook on the way they approached both positive and negative life events.

Theme 6: Spiritual Experiences

Most of the participants had spiritual experiences which was not surprising seeing as Heartfulness meditation was deeply rooted in spiritual origins. Nevertheless, how each participant experienced spirituality was uniquely their own. Dhruv stated that Heartfulness meditation had made him more interested in the evolution of himself:

"I was like everyone wishing to (have) a happy and successful life, but this really made me understand the significance of evolution of what we are here, born for and that's helped me become more divinized over time". P10/I1/Line 120-122

While social connection was what everyone craved for, as it was a fundamental survival aspect for humanity, living alone did not trouble Asad:

"I'm much more peaceful. I can stay very much alone and don't feel lonely because after a while, this meditation leads to feeling the presence of the divine in us. And it's such

a joy to live life in the presence of the divine in day to day life, this is the heartfulness way". P12/I1/Line 20-23

Discussion

This study aimed to understand the lived experiences of Heartfulness practitioners, and the themes suggest the structure that Heartfulness practitioners go through in their journey of meditation. The themes found were: process of heartfulness meditation, physical experiences, psychological experiences, social experiences, cognitive experiences, and finally spiritual experiences. All the themes are discussed in detail in this section.

Process of Heartfulness Meditation

In line with previous studies, participants have stated that despite hailing from different social and cultural backgrounds, the flexibility of Heartfulness meditation allowed them to integrate it into their modern lifestyle. In addition, the Heartfulness cleaning process was found to be helpful to subdue thought intrusion and confusion (Amatya, 2019). The aspect of yogic transmission expedites the meditation process, thereby allowing new practitioners to feel the effects within a brief period of time (Arya et. al., 2018).

Physical Experiences

Participants stated that Heartfulness helped them to build mental strength to deal with physical pain which led to the acceptance of their physical condition. This was elicited in a study done by Amatya (2019), which supported that Heartfulness meditation aids in relieving stress and healing our bodies. Many participants stated that the positive changes observed in their physical self was a result of a peaceful mind. In addition, a study done by Arya et. al., (2018) also found that Heartfulness meditation decreases sympathetic effect, therefore increasing parasympathetic tone.

Psychological Experiences

Participants reported that they gained a pause between stimuli in the environment and their own natural response which allowed them to view life events through different lenses. Participants mentioned that they managed to overcome their feeling of insecurity and introverted behaviour with the Heartfulness practice and felt more comfortable in their own skin. This is aligned with a study that found Heartfulness meditation was beneficial for individuals suffering from anxiety, depression, psychological distress, PTSD and undergoing emotional turmoil (Singh, Mohan & Kumar, 2011).

Social Experiences

In the social domain, although many participants were introverted in nature, they now found themselves to be more comfortable in social situations. In addition, an interesting finding was that parenting styles have also taken a different direction after practising Heartfulness, promoting healthier family dynamics. Although the study did not specifically mention Heartfulness, nevertheless Burgdorf, Szabó, & Abbott (2019) found that mindfulness interventions for parents may reduce parenting stress and thereby improve youth psychological functioning. This is an area that needs to be explored in the future.

Cognitive Experiences

Participants broadly stated that their thinking ability had improved with the practice as they were now able to take better control of their lives as they viewed life events as opportunities which help them evolve. These findings are in line with the study done by Arunachalam,

Jagatheesaperumal and Sundaram (2020) which demonstrated an improvement in electroencephalogram (EEG) and functional MRI (fMRI) signal frequencies from the heart to the brain that was observed in regular practitioners of Heartfulness meditation. This has been shown to improve one's cognitive performance. Arunachalam and colleagues (2020) also further support these findings by showing evidence that cognitive skills, contextual memory, attention, logical thinking, and problem-solving capability are highly improved in Heartfulness practitioners.

Spiritual Experiences

This study found that spirituality was an individual goal. Participants who initially approached heartfulness with various aims, such as relief from a stressful lifestyle, to increase physical well-being, or seeking mental clarity and emotional balance, upon commencing meditation, soon began to harvest benefits that far exceeded these aims. Participants shared that Heartfulness helped them balance their spiritual and material life as it embraces experiential learning, which was highlighted in a study done by Varu (2017).

Implications

The findings of this study have the potential to provide deeper and more comprehensive understanding on the lived experiences of Heartfulness practitioners, particularly from multiple life domains. The findings are useful in providing important information for seekers to experience this system of meditation and to be explored as an intervention in clinical settings for relevant biopsychosocial problems. Moreover, the findings of this study also have the potential to contribute to the literature in Malaysia and other countries as research on Heartfulness is still at its infancy.

Limitations and Future Study

The participants as practitioners of Heartfulness meditation were selected based on their ability to converse in English. However, such lived experiences could be different for those who natively spoke other languages. In addition, only those participants who regularly practised this form of meditation diligently for at least a year were selected. The findings of this study beg the question on whether the benefits experienced varied by how much time each practitioner devoted to Heartfulness meditation. Future studies could explore wider components of Heartfulness meditation and its role in coping strategies as well as epigenetics.

Conclusion

Overall, the findings of this study provide an insight on the lived experiences of Heartfulness meditation and has found that practitioners could develop their physical, psychological, social, cognitive, as well as their spiritual life. Findings of this study helps to shed further light on Heartfulness in the realm of science, giving voice to a personal world that is often unheard, with more to discover.

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Research Note

COVID-19: Health information seeking and adherence to safe practices in Malaysia

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ABSTRACT

The coronavirus disease has spared no country and has galvanised the general population into altering their behaviours amid fears of uncertainties. A survey on health information seeking and adherence to safe practices during this pandemic among the public was carried out in Malaysia. An assuring number of 96% of respondents (n= 412, N = 429) actively sought health information regarding COVID-19. Unfortunately, more than half of the respondents (n=242, 58.7%) had difficulties verifying the accuracy of the sourced information. There were differences between the sociodemographic factors and adherence to safe practices where it was identified that males, young-aged respondents, and the Malay ethnicity were less adherent to safe practices as compared to other groups.

Keywords: *Coronavirus, safety measures, information needs, health literacy.*

At the time when this survey was carried out, the number of COVID 19 cases had surpassed 71 million cases worldwide with the daily number of cases in Malaysia exceeding 1000[1]. It has affected the population from all nations, irrespective of age, gender, ethnicity, and occupational status. Hence, a team of Semester 5 MBBS students from the International Medical University (IMU) had conducted a preliminary study on health information seeking along with adherence to safe practices towards COVID-19 in the local context as part of their community health survey project.

A quick online Google survey was conducted on 27th August 2020, with a link opened from 1200 to 1700 hours. This study looked at the general population from both East and West Malaysia. The power analysis was used to ensure a representative sample size for an online cross-sectional study survey, with a 5% significance level, 80% power, an effect size of 0.8, and an estimated non-response rate of 20 to 30%.[2,3] The responses were then gathered using a non-probability snowball sampling method. The inclusion criteria for this study were Malaysian adults, aged 18 years and above who have been staying in Malaysia since the implementation of the Movement Control Order (MCO), March 18th 2020. Respondents must also be able to answer the survey questions in Bahasa Melayu or English. The survey aimed to assess health information seeking and adherence to safe practices within the community. The independent variables were age, ethnicity, region, educational level, and occupational status. Dichotomous questions inquiring on the sources of information, the type of information respondents preferred to be regularly updated on and the challenges faced during health information seeking were used to determine the information seeking behaviour. Meanwhile, adherence to safe practices were measured using Likert-scale questions exploring the compliance of proper face masks use, frequent hand washing and social distancing practices.

The respondents mostly sought information regarding the virus or pandemic from online sources (n=412, 96.6%) while traditional media sources and human sources were not as preferred. With the Malaysian government and Ministry of Health (MOH) regularly providing updates related to COVID-19, social media can be considered a reliable and official source. Along with its immense popularity and easy accessibility, many are shifting away from seeking information via traditional media. Majority of the respondents actively seek health information regarding COVID-19. Despite this, there is a significant number of respondents who faced difficulties in verifying the accuracy of their information. With online sources (websites and social media) being the most preferred, the government should direct more effort in ensuring reliable information is uploaded in these channels, focusing on daily status updates regarding numbers of

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COVID-19, hotspot locations in Malaysia, government directives and updates regarding vaccinations.

The study provided an insight of the differences between the socio demographic characteristics and the adherence to safe practices of Malaysians during COVID-19. Our findings showed that the younger age group (18-35 years old) were less adherent to safe practices as compared to older adults. This finding is a worrying factor in efforts to curb the pandemic as this age group often presents mildly or asymptomatic when infected with COVID-19[4]. This increases the potential of spreading COVID-19 within the rest of the community. In contrast, the older age group showed higher adherence due to better understanding of their own risks of complications. In terms of gender, women were found to be more adherent to the safe practices compared to men. Research has found that women have been internationally identified to see COVID-19 as a much bigger threat than men[5]. This concern has caused women to be more willing to follow and adopt safe practices[6]. Men on the other hand showed less adherence, which is consistent with previous research where they showed significantly less adherence to preventive measures during the SARS and MERS pandemics[7]. Meanwhile, the Malay ethnicity was shown to be less adherent than other races. This could be due to the Malay culture of shaking hands when meeting with people. This form of greeting has become rooted within the community that it becomes harder to avoid especially during any religious or cultural events. There were no distinct effects of education level and occupational status on adherence to safety practices.

Table I: Socio-demographic characteristics of respondents (N=429)

VARIABLE	GROUPS	n
Age group	Young-aged	312
	Middle-aged	75
	Old-aged	42
Ethnicity	Malay	164
	Chinese	157
	Indian	15
	Bumiputera	39
	Others	54
Region	Northern Region	57
	East Coast Region	51
	Central Region	177
	Southern Region	41
	East Malaysia	103
Educational level	Secondary school	21
	College/ Pre-University	92
	University	316
Occupational status	Unemployed	66
	Student	251
	Employed	112

Table II: Responses to questions regarding health seeking information (N = 429)

Question	Response	n	Valid percentage
H1: Have you searched for COVID-19 related health information since the start of Movement Control Order (MCO)?	No	17	4.0%
	Yes	412	96.0%
H1a: If not, why?	Not interested	4	26.7%
	Passively get information from media sources	7	46.7%
	Passively get information from other people	4	26.7%
H2: How do you obtain health information related to COVID-19?	Print and media sources	179	43.3%
	Online sources	399	96.6%
	Human sources	117	28.3%
H3: What is your preferred print and media resource for obtaining COVID-19 related information?	Television	151	43.9%
	Newspapers	44	12.8%
	Radio	15	4.4%
	Healthcare posters	55	16.0%
	Magazines	3	0.9%
	YouTube broadcasts	76	22.1%
H4: What is your preferred online source for obtaining health information related to COVID-19	Health websites	346	83.8%
	Social media	290	70.2%
	News websites	198	47.9%
	Online databases	115	27.8%
	Weblogs/ Forums	27	6.5%
H5: Do you forward health information received to friends/close ones as soon as you read without checking if the information is true?	No	267	64.8%
	Yes	145	35.2%

Table II: Responses to questions regarding health seeking information (N = 429) *(cont'd)*

H6: What is the COVID-19 information that you want to be updated about regularly?	Prevention methods	254	61.7%
	Daily COVID-19 status in Malaysia and hotspots	369	89.6%
	Government directives	321	77.9%
	Symptoms	188	45.6%
	Vaccination updates	282	68.4%
H7: Do you face challenges when seeking health information related to COVID-19?			
a. Lack of access to appropriate and practical information sources in a simple language	No	329	79.9%
	Yes	83	20.1%
b. High costs of access to health information	No	369	89.6%
	Yes	43	10.4%
c. Lack of information or inability to find the information being searched for	No	320	77.7%
	Yes	92	22.3%
d. Difficulty in determining if the information is true	No	170	41.3%
	Yes	242	58.7%

Table III: Responses to questions regarding adherence to safety practices (N = 429)

Questions	Never	Rarely	Sometimes	Very often	Always
I wear a 3-ply mask/some type of face covering when leaving the house	7 (1.6%)	8 (1.9%)	19 (4.4%)	57 (13.3%)	338 (78.8%)
I wear my face mask with the coloured side facing outwards	15 (3.5%)	6 (1.4%)	11 (2.6%)	24 (5.6%)	373 (86.9%)
When I wear my mask, it covers my nose, mouth & chin	5 (1.2%)	5 (1.2%)	11 (2.6%)	34 (7.9%)	374 (87.2%)
I pull down my mask while eating instead of removing it *	89 (20.7%)	60 (14.0%)	76 (17.7%)	54 (12.6%)	150 (35.0%)
I place the mask in a plastic/paper bag when not in use	83 (19.3%)	61 (14.2%)	78 (18.2%)	85 (19.8%)	122 (28.4%)
I change my mask every 4 hours or less of continuous use	105 (24.5%)	80 (18.6%)	112 (26.1%)	73 (17.0%)	59 (13.8%)
I wash my hands with soap & water for at least 20 seconds after going out	5 (1.2%)	39 (9.1%)	100 (23.3%)	107 (24.9%)	178 (41.5%)
I use hand sanitizers	6 (1.4%)	18 (4.2%)	72 (16.8%)	104 (24.2%)	229 (53.4%)
I greet my friends & family by shaking hands or hugging *	17 (4.0%)	21 (4.9%)	97 (22.6%)	114 (26.6%)	180 (42.0%)
I eat a balanced diet to boost my immunity & fight against the potential threat of COVID-19 virus	22 (5.1%)	52 (12.1%)	132 (30.8%)	107 (24.9%)	116 (27.0%)
I share food with colleagues and friends *	20 (4.7%)	37 (8.6%)	81 (18.9%)	113 (26.3%)	178 (41.5%)
I follow the stay-at-home instructions issued by the government	2 (0.5%)	5 (1.2%)	16 (3.7%)	81 (18.9%)	325 (75.8%)
I keep to social distancing measures (>1m distance) (i.e. not entering the lift when the maximum capacity has been reached)	1 (0.2%)	8 (1.9%)	39 (9.1%)	125 (29.1%)	256 (59.7%)
I use the MySejahtera app to check-in when I am outside	14 (3.3%)	13 (3.0%)	23 (5.4%)	70 (16.3%)	309 (72.0%)
I go to public or crowded places *	19 (4.4%)	32 (7.5%)	126 (29.4%)	154 (35.9%)	98 (22.8%)
I attend social events/gathering during the pandemic *	18 (4.2%)	29 (6.7%)	44 (10.3%)	103 (24.0%)	248 (57.8%)
I cover my mouth & nose whenever I cough or sneeze when I am outside	8 (1.9%)	11 (2.6%)	21 (4.9%)	67 (15.6%)	322 (75.1%)
I touch my eyes, nose & mouth when I am outside *	26 (6.1%)	42 (9.8%)	130 (30.3%)	127 (29.6%)	104 (24.2%)
I stay at home when I am unwell	20 (4.7%)	10 (2.3%)	18 (4.2%)	65 (15.2%)	316 (73.7%)

* Questions were negatively coded in calculation of adherence to safety practices score.

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Case Report

Effectiveness and psychological improvement in chronic vestibular problem using home-based balance rehabilitation with step 1 (head and neck movement): A case report

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Abstract

Chronic vestibular problem or disorder is a complicated vestibular disorder that can involve multiple complications such as psychological and others. A standard and latest term that is globally used for this chronic disorder is recurrent vestibulopathy. Recurrent vestibulopathy is defined as an illness of unknown cause characterized by more than a single episode of vertigo of duration characteristic of that occurring with hydrops, but without auditory or clinical neurological symptoms or signs for more than 6 months' duration. During this pandemic period, home-based module is one of the valuable rehabilitation methods to treat non benign paroxysmal positional vertigo vestibular cases.

Vestibular Rehabilitation (VRT) is a specific form of physical therapy designed to habituate symptoms and promote adaptation to and substitution for various aspects of deficits related to a wide variety of balance disorders. Most VRT exercises involve head movement which are essential in stimulating and retraining the vestibular system. Bal Ex is a home-based module of VRT with specific modules that are available in three forms viz. manual book, poster and DVD. This module was developed with a combination of customized Cawthorned Cookseey Exercise and prayer movements. Foam exercise is one of the VRTs. It consists of twenty movements divided into three levels. This physical exercise module has many advantages. In this case study we evaluated the effectiveness and psychological improvement in chronic vestibular problem using level 1 Home-based Balance Rehabilitation in a 30-year-old female patient.

Keywords: *Bal Ex, home-based module, Recurrent Vestibulopathy, Bal Ex Module, imbalance*

INTRODUCTION

The term 'Recurrent Vestibulopathy' refers to a condition with an unknown cause that is marked by more than a single episode of vertigo of duration similar to that seen with hydrops but without auditory or clinical neurological symptoms or signs. Patients with frequent episodes of vertigo lasting from about 5 minutes to 24 hours with no auditory or neurological symptoms or signs are referred to as having recurrent vestibulopathy[1]. This disorder can be characterized by dizziness, imbalance, nausea and vision problems. Three of the most common clinical syndromes manifesting as recurrent vertigo are benign paroxysmal positional vertigo (BPPV), Meniere's disease (MD) and vestibular neuronitis (VN)[2].

Case Report

A 30-year-old female patient, diagnosed as recurrent vestibulopathy, presented with dizziness and balance problem six months ago. She also complained of sudden attack of vomiting, feeling like floating and nausea. The patient then underwent home-based BAL Ex treatment just for Level 1 using only the manual, doing this twice per day for 1 month, 60 minutes each session and without taking any medicine during the treatment.

On examination, the patient was conscious and alert. The patient was given three questionnaires to complete before and after treatment. These were the Malay Version of Vertigo Symptom Scale (MVVSS), Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI). After 1 month of balance exercise only in level 1, the patient showed huge difference and improvement (2% for MVVSS, 83% for BDI, and 18% for BAI).

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Table I: Subjective measures Pre- and Post-treatment

Component	Pre-therapy	Post 1 month therapy
Malay Version of Vertigo Symptom Scale (MVVSS)	13	5
Beck Depression Inventory (BDI)	12	2
Beck Anxiety Inventory (BAI)	22	18

To evaluate the postural control pre- and post-therapy we used Bal Exzz Foam test (Figure I). This Bal Exzz test has a structured scoring foam that is divided into seven sections (Table II). Positive Fukuda test has been identified (Table II). The patient previously experienced symptoms in the past six months but improved after the treatment.

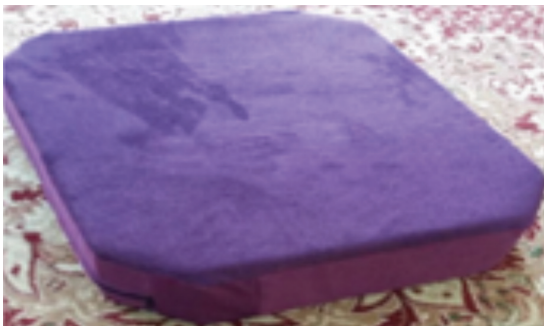

Figure I: Bal Ex Foam

Table II: Bal Ex Scoring Foam

Level	Description	Pre-therapy	Post 1 month therapy
1	Stand on the floor with arms across your chest and feet together and hold for 30 seconds (opened eyes)	Normal	Normal
2	Stand on the floor with arms across your chest and feet together and hold together and hold for 30 seconds (closed eyes)	Normal	Normal
3	Stand on the floor with arms across your chest, toe touching the other side of heel and hold for 30 seconds (opened eyes)	Normal	Normal
4	Stand on the floor with arms across your chest, toe touching the other side of heel and hold for 30 seconds (closed eyes)	< 4 seconds	< 4 seconds
5	Stand on a 3-inch-high density foam cushion with your arms crossed, feet together and hold for 30 seconds (opened eyes)	Normal	Normal
6	Stand on a 3-inch-high density foam cushion with your arms crossed, feet together and hold for 30 seconds (closed eyes)	< 2 seconds	< 2 seconds
7	Fukuda test	Degree: > 50 degrees Side Deviation: to Left side	Degree: > 50 degrees Side Deviation: to Right side

VRT is a type a physical therapy that aims to habituate symptoms and encourage adaptation to and substitution for various aspects of deficits associated with a wide variety of balance problems. The vestibular system must be stimulated and retrained, hence the majority of VRT activities include head movement. The prognosis for patients with recurrent vestibulopathy is good[3].

Bal Ex is a home-based module that is available in three forms viz. manual book, poster and DVD[4]. The Bal Ex Home-based balance is a VRT with specific modules and a video guide. To assist people with various balance disorders, it includes nine distinct languages (Malay, English, Mandarin, Tamil, Hokkien, Nigeria, Parsian, and Arabic). The Bal-Ex module video is a completely structured home-based video and audio guided tool designed to help individuals with Peripheral Vestibular Disorder (PVD). This module was created using a modified exercise and prayer movements. One of the VRT exercises is foam exercise. There are numerous advantages to use this physical exercise module. This exercise consists of 20 movements and is divided into 3 levels targeting specific functions of balance organs (Table III). Bal Ex is an adaptation from Customized Cawthorned Cookseey Exercise and prayer movement.

Table III: Three levels in the Bal Ex module video

Level 1	Level 2	Level 3
• Head & neck • Eye focusing • Heaviness of the neck	• Positioning • Daily activities (i.e. prayer, up and down) • Return to normal daily activities	• Postural • Increase the postural control • Return to normal walk, running and use a stair

Discussion and Conclusion

Recurrent Vestibulopathy is one of the vestibulopathies disorders of the inner ear. Dizziness and trouble in balance are the most common symptoms. The prognosis for patients with recurrent vestibulopathy is good. After Bal Ex Home-based Balance Rehab in level 1, the patient showed fast recovery whereby her dizziness is reduced and she improved with mild imbalance. With home-based step 1 module, patients will be able to improve their postural control if they continuously undergo balance rehabilitation at home.

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