
Information Needs and Usage of Paramedical Professionals (Paramedics) in Sri Lanka

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Abstract - *The purpose of this study is to understand the information needs, sources of information used, and problems encountered by Paramedics in Sri Lanka. This research adopted deductive approach and used quantitative methods in data collection and analysis. The self-administered questionnaires were distributed among a sample of fifty-one Paramedics, and the data analysis involved descriptive and inferential statistics. It was found that the Paramedics mainly require information for patient care (76.5%) and staying up-to-date (72.5%), which prompt them to seek information daily and weekly respectively, and their affiliated departments together with tasks-performed exert highly significant influence on their information needs. Though, Internet (90.2%) and knowledge of colleagues (74.5%) are the mostly used general information resources, their subfield-specific resources find very high usage. They are well satisfied on the accuracy of information in their field, yet less content on availability, cost and timeliness. Limited access to information resources (78.4%) and lack of time (64.7%) are the common problems encountered by the Paramedics in securing professional information. This study shows that the Paramedics make efforts to stay information-rich to help them in patient care, though information is rarely sought for formal higher education, which is not a requirement for their profession in Sri Lanka. Hence, they heavily use the Internet and share knowledge with their peers. Some of these findings compare with research outputs of other countries, while others contrast. These results would help in improving the information service for the Paramedics and would form a basis for future comprehensive studies globally.*

Keywords: Information needs, Information usage, Paramedical professionals, Sri Lanka.

1. Introduction

The Paramedical professionals, also called the Paramedics, are skilled to provide supportive measures to clinicians in diagnosing and treating diseases. A significant portion of the workforce of the health sector in Sri Lanka is made up of these professionals, whose contribution towards the protection and augmentation of the health and wellbeing of citizens is indispensable (Tiwari, Kumar & Singh, 2017). The Paramedics are further categorized as per their field of specialization, and those in the Sri Lankan health system are Pharmacists, Lab technicians, Radiologists, Physiotherapists, Nutritionists, Audiologists and Bio-medical Engineers, who play unique roles in both public and private hospitals. Therefore, they should be readily provided with all the required tangible and intangible resources, so that they can discharge high quality and timely health services. In that sense, Miriami (2018) claims that information is a vital resource for the Paramedics to answer the clinical questions, which enhances the care of their patients. He further shows that the types of information resources required by them also depend on the purpose in hand. Moreover, Noguchi, Ogino & Sato (2015) strongly assert that the information needs and usage greatly differ even among various

categories of Paramedics. Further, the hospital authorities would be able to eradicate or mitigate several performance-related issues among the Paramedics by making them rich in information.

This research was carried out involving the Paramedics of a well-reputed private hospital situated in Colombo, Sri Lanka that has a history of more than seven decades and is armed with more than 200 beds for in-service treatment for patients. This is the first ever hospital in Sri Lanka to secure gold standard in global healthcare by obtaining Joint Commission International (JCI) accreditation, an American-based world body that looks after quality treatment for sick population. This hospital also takes pride of being world famous among the cardiac patients, as it is equipped with modern facilities, which are required for a Heart Centre. In addition, other auxiliary services are also provided to patients by eminent medical consultants, commissioned with modern medical equipment and appliances. This hospital was chosen for this study, as this is one of the oldest, largest and trusted hospitals today in Sri Lanka with all the latest facilities and consists of full-fledged paramedical divisions on par with other major hospitals in the country. Therefore, a study conducted involving the professionals of this hospital would produce a comprehensive knowledge on the information needs and usage patterns, and the results can be generalized to all the Paramedics of Sri Lanka.

2. Statement of Problem

Unlike other fields, the medical field is given the major responsibility of maintaining the citizens healthy and comfortably, which is a basic requirement for a country to thrive in other sectors. This illustrates the uniqueness and the caliber of the services rendered by the professionals in the health sector, and their magnitude towards the development of the nation. Hence, it becomes apparent that the information professionals have to support the above personnel by identifying various types of information preferred by them. Moreover, the dynamic nature of the medical field and the rapid advancements in the Information and Communication Technology (ICT) make the Paramedics encounter new developments continuously from every corner of the world, and they need to have full and instant access to information on all those innovations in the appropriate format for them to carry out their duties properly. However, according to a literature review by MSKTC (2010), the clinical information needs of the health professionals are not satisfactorily addressed.

In order to promptly cater the Paramedics with their information requirements, a systematic meticulous study is essential to understand their information needs, speedy information channels, cost-effective sources, information source preference, and the problems faced by them in securing information (Prakasan, 2013), which in turn will help the information professionals to support accordingly. In this effort, the review of literature such as Andualem, Kebede & Kumie (2013), Cheg & Lam (1996), Miriami (2018), MSKTC (2010), Noguchi, Ogino & Sato (2015), and Prakasan (2013) associated with information needs, sources, library usage, e-resource usage, barriers to seek information and the like spell that the said-parameters greatly vary within categories of Paramedical fields and across geographical boundaries.

In that sense, it was found out from the literature search that such a study was not conducted on the Sri Lankan Paramedics so far in the history. Hence, this research is undertaken to study the information needs and usage patterns of the Paramedics serving the health sector in Sri Lanka. This study focuses on the Paramedics serving a reputed hospital in Colombo, Sri

Lanka, and the findings are presented in this paper. The researcher expects that the results of this study would be of great use for the respective hospital authorities and for many other similar hospitals in the country, to satiate the information needs of the Paramedics by enhancing the information services to suit the requirements of each category. On the other hand, the methodology and the data analysis techniques used in this research together with the results could lay a foundation for large-scale studies on the information seeking behaviours of Paramedics serving the complete health sector (government and private hospitals) in Sri Lanka or even the other nations.

3. Objectives

- To find out the information needs of the Paramedics in Sri Lanka.
- To identify various sources through which the information is accessed by these Paramedics.
- To determine the problems encountered by these Paramedics in accessing professional information.

4. Research Methodology

4.1 Research approach

Out of the two research approaches as defined by Saunders, Lewis & Thornhill (2009), this study belongs to deductive approach, where top-down method is used from general theories and literatures to specific observations. That is: the established theories on the information seeking behaviour such as Leckie model of 1996 used by other similar researches were adopted as the base for this study. Then, the data were collected from the Paramedics to analyse, and to make more specific conclusions on the information seeking behaviour of Sri Lankan Paramedics particularly.

4.2 Research type

According to the definitions of Kumar (1999), this is an applied research, where the results of this study can be applied to solve specific real-life problems. The adopted research procedures and techniques are applied to a group of entities (Paramedics) to understand a specific aspect (their information needs and usage), and the findings of this research would be used to enhance the performance of the Paramedics. Further, this study followed a structured approach, where research objectives, methods and data collection tool were scientifically predetermined via literature reviews, and hence the results are generalizable. Similarly, the quantitative method is adopted for this study, to comply with the other similar researches and due to its advantages for research process and the respondents (Kumar, 1999).

4.3 Study population and sample

The study population comprises of all fifty-one (51) Paramedics of the hospital considered for this study. The convenience sampling was opted in selecting this hospital for the study, and Figure 1 shows the selection of sample adhering to Morgan's table for sample size for each category. Accordingly, all fifty-one Paramedics in the study population were included in the sample.

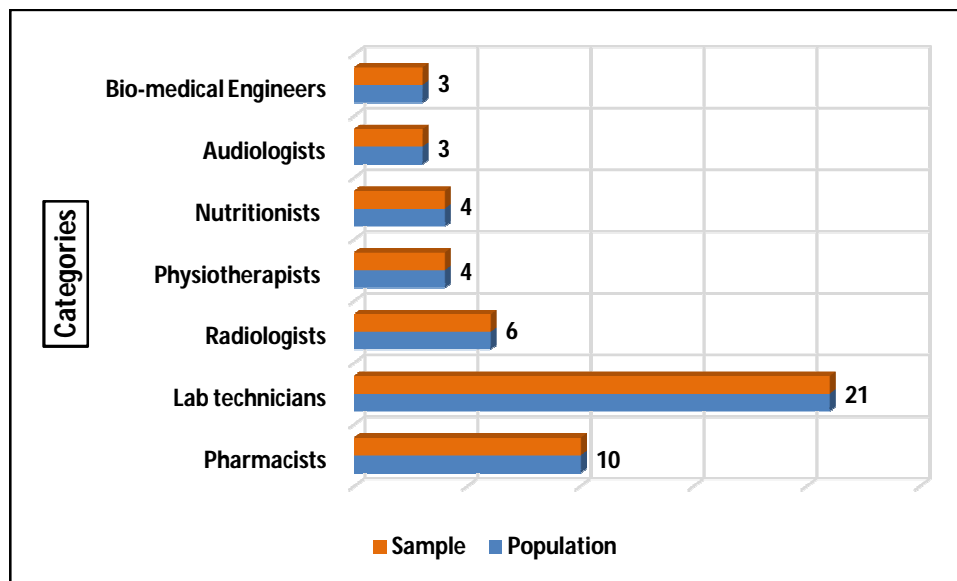


Figure 1: Study population and sample

A self-administered questionnaire survey was conducted in January 2020. Questionnaire was constructed with the support of literature review and adopting information seeking behaviour models especially the Leckie model of 1996 as the framework, and its internal consistency was tested using Cronbach's alpha. Then, the data was analysed using the software package SPSS.

5. Results

Response rate: All of the questionnaires distributed among 51 Paramedics were returned producing a response rate of 100%.

Reliability analysis: The internal consistency was tested using Cronbach's alpha, which was 0.886 implying a very good consistency.

Demographic details: This sample contains more males (60.8%) and Paramedics in the age group of 41-50 years (37.3%), with majority having 1-10 years of experience (39.2%). The Paramedics perceive that their ICT and information searching skills are moderate with mean values of 2.43 and 2.47, respectively on a 3-point Likert scale. However, they have high interest (mean: 2.71) to improve their information literacy.

5.1 Information Needs

Two key parameters that have to be examined in order to understand the information needs are the purpose for which the information is needed and the frequency in which the information is sought for those purposes (Preez, 2008; Sapa, Krakowska & Janiak, 2014).

5.1.1 Purposes of information:

The three most prioritized purposes of information were considered in this study as in Table 1 with mean and standard deviation values.

Table 1: Purposes of information

Purposes	Mean (on 3-point Likert scale)	Standard Deviation	Respondents above mean	Percentage
Patient care	2.73	0.532	39	76.5%
Own higher studies	2.31	0.469	16	31.4%
Staying up-to-date	2.71	0.502	37	72.5%

Majority has opted patient care (76.5%) to be the highly important purpose, for which they seek information. Similarly, staying up-to-date (72.5%) is the next important purpose for the respondents to seek information. In the meantime, most of them feel that their higher studies is a less important purpose that needs information.

5.1.2 Frequency of information seeking:

The frequencies, in which the respondents search information for the purposes that are dealt with in above section, are presented in Table 2.

Table 2: Frequency of information seeking

Frequency of information seeking for:	Mean (on 3-point Likert scale)	Standard Deviation	Respondents above mean	Percentage
Patient care	2.69	0.583	38	74.5%
Own higher studies	2.22	0.577	15	29.4%
Staying up-to-date	2.51	0.674	31	60.8%

Majority has opted that patient care (74.5%) requires information most frequently, which is daily. Similarly, staying up-to-date (60.8%) takes the second rank in the frequency of information needs. However, the results show that their higher studies is the purpose that requires information least frequently.

5.1.3 Influence of demographic & professional factors on information needs:

A Chi-square test was conducted for the overall information needs against the demographic (age and gender) and professional factors (department, designation together with tasks undertaken, and years of experience) to produce the results in Figure 2.

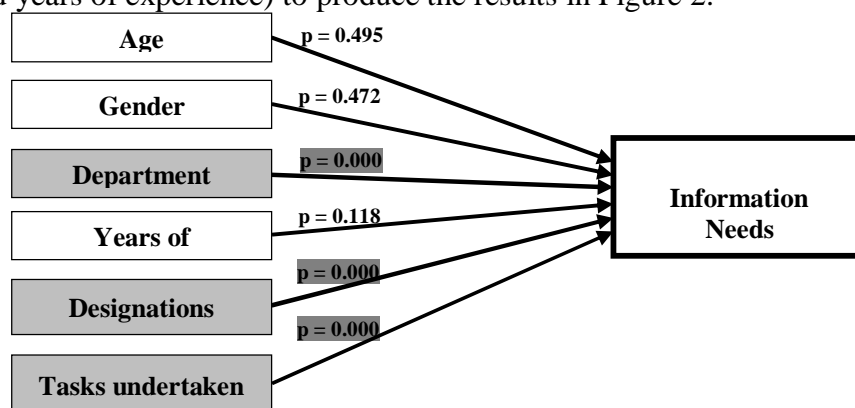


Figure 2: Influence of professional factors on information needs

These results show that affiliated departments, designations and the tasks performed have highly significant influence (p-values <0.01) on the information needs of the Paramedics.

5.2 Sources of information

5.2.1 Format of information preferred

Figure 3 depicts that most of the respondents (80.4%) prefer to use both printed and electronic formats of information.

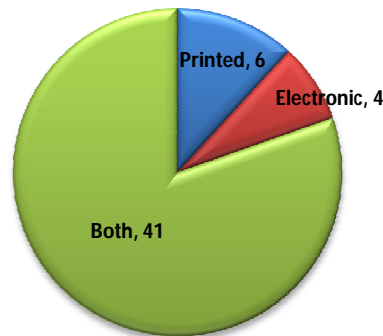


Figure 3: Preferred format of information sources

5.2.2 Usage of information sources

Usage of various information resources were ranked by the Paramedics, where some are common to all the subcategories (Figure 4) and the others are field-specific, as in Table 3.

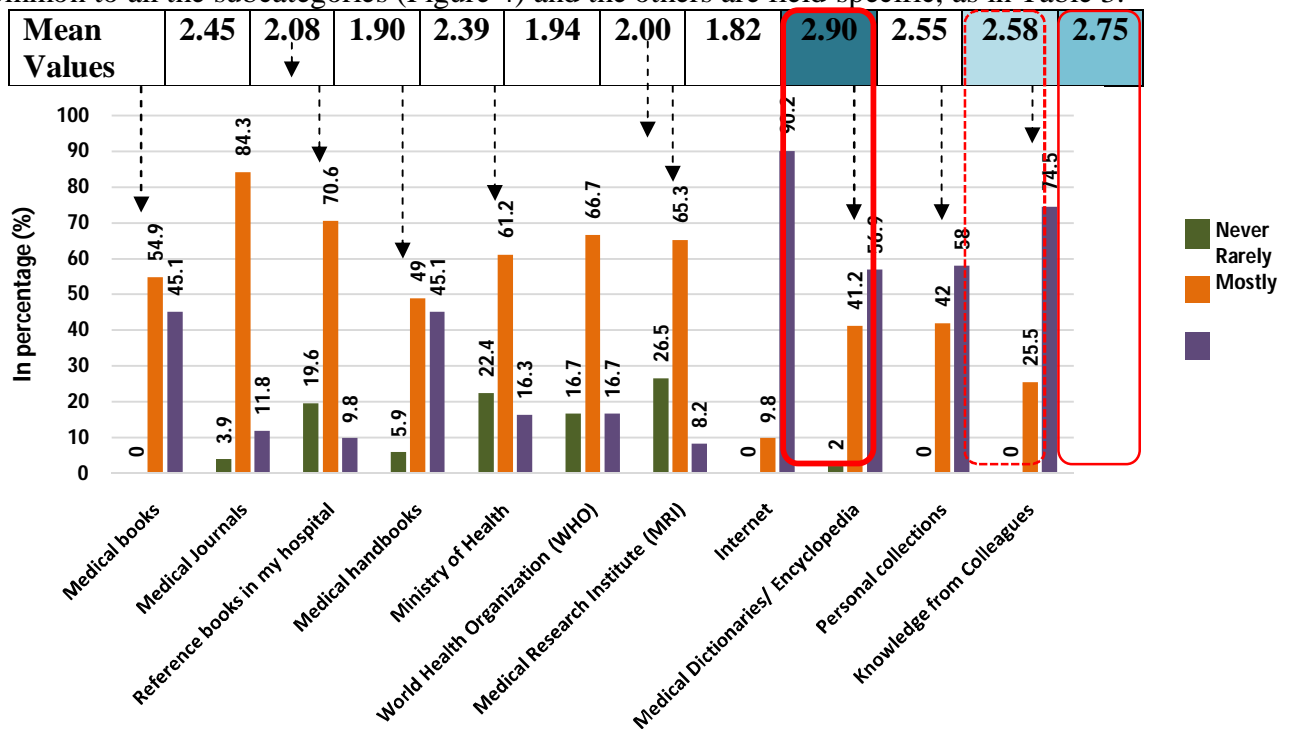


Figure 4: Usage of general information resources (on a 3-point Likert scale)

Out of the general information sources the Internet has the highest usage (mean: 2.90, 90.2% mostly use), followed by knowledge from colleagues (mean: 2.75, 74.5% mostly use) and personal collections (mean: 2.58, 58.0% mostly use). The medical dictionaries, medical

books and the handbooks also find fair usage among the Paramedics, while medical journals and reference books are rarely used.

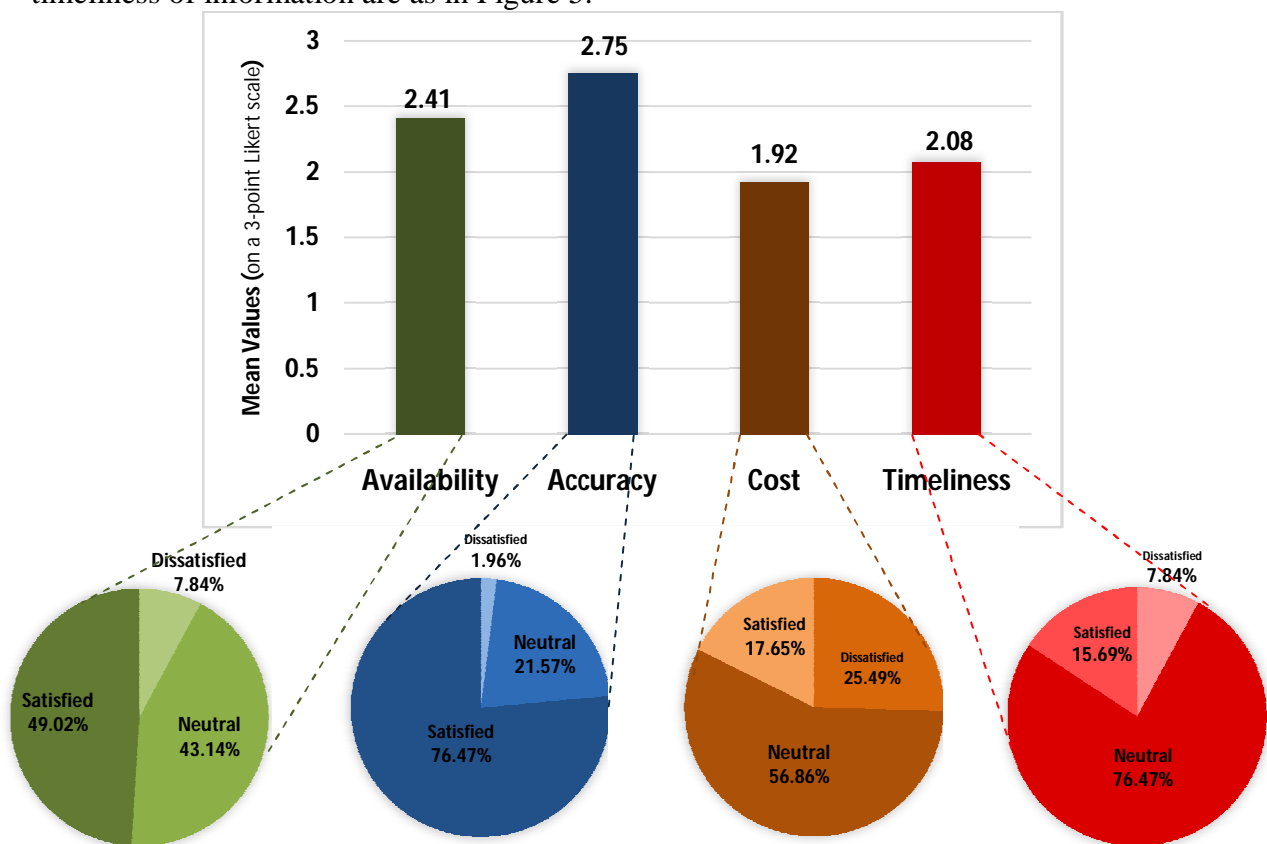
Table 3: Usage of field-specific information resources

Pharmacists				
Resources	Usage (in %)			Mean
	Never	Rarely	Mostly	
National Medicines Regulatory Authority (NMRA)	0	10	90	2.90
Pharmaceutical company's websites	0	50	50	2.50
Lab Technicians				
Resources	Usage (in %)			Mean
	Never	Rarely	Mostly	
Sri Lanka Association of Medical Laboratory Technologists	0	0	100	3.00
European Federation of Clinical Chemistry and Laboratory Medicine (EFLM)	52.4	42.9	4.80	1.52
Lab test Protocols	5.9	20.6	73.5	2.68
Radiologists				
Resources	Usage (in %)			Mean
	Never	Rarely	Mostly	
Atomic Energy Regulatory Board (Sri Lanka)	0	0	100	3.00
Labour Laws	0	50	50	2.50
Occupational Hazards	0	0	100	3.00
Physiotherapists				
Resources	Usage (in %)			Mean
	Never	Rarely	Mostly	
World Confederation for Physical Therapy	0	0	100	3.00
American Physical Therapy Association (APTA)	0	25	75	2.75
Chartered Society of Physiotherapy	0	50	50	2.50
Nutritionists				
Resources	Usage (in %)			Mean
	Never	Rarely	Mostly	
American Heart Association (AHA)	0	0	100	3.00
European Society for Parenteral and Enteral Nutrition (ESPEN)	0	0	100	3.00
American Society for Parenteral and Enteral Nutrition (ASPEN)	0	0	100	3.00
Audiologists				
Resources	Usage (in %)			Mean
	Never	Rarely	Mostly	
Sri Lanka Association of Audiologists (SLAA)	33.3	66.7	0	1.67
European Association of Hearing Aid Professionals (AEA)	100	0	0	1.00
American Speech-Language-Hearing Association (ASHA)	0	0	100	3.00
Bio-medical Engineers				
Resources	Usage (in %)			Mean
	Never	Rarely	Mostly	
Institute of Engineers of Sri Lanka (IESL)	66.7	33.3	0	1.33
Biomedical Engineering Division of IMech	0	100	0	2.00
Biomedical Engineering Society (BMES)	0	33.3	66.7	2.67

It can be learnt from Table 3 that each subcategory relies on a specific resource for information, in addition to the general resources. Accordingly, NMRA is heavily used by the Sri Lankan pharmacists, while the key resources of information for lab technicians and radiologists are Sri Lanka Association of Medical Laboratory Technologists and Sri Lankan Atomic Energy Regulatory Board, respectively. Physiotherapist mainly depend upon World Confederation for Physical Therapy, whereas audiologists rely on American Speech-Language-Hearing Association (ASHA). Nutritionists draw information from three separate sources namely American Heart Association (AHA), European Society for Parenteral and Enteral Nutrition (ESPEN) and American Society for Parenteral and Enteral Nutrition (ASPEN), and the biomedical engineers mostly use the information from the Biomedical Engineering Society (BMES).

5.2.3 Perceptions on non-functional characteristics of information sources

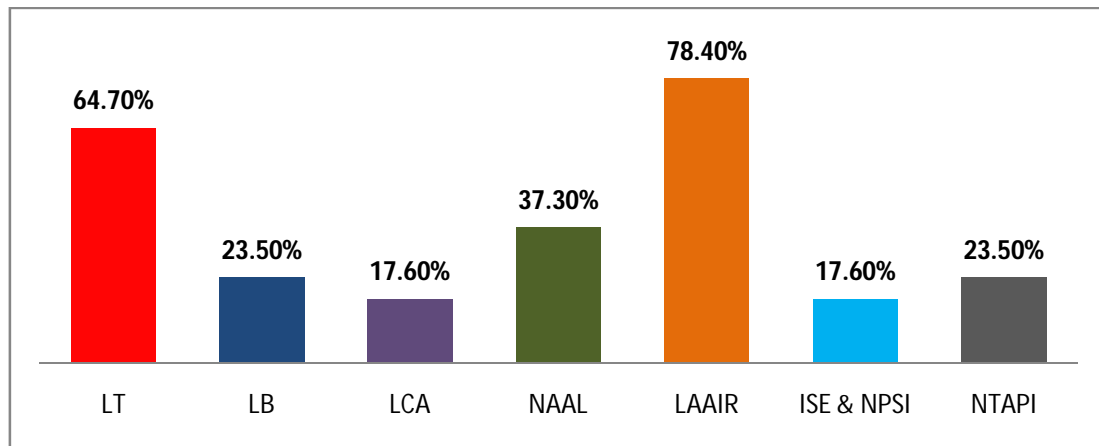
The perceptions of the Paramedics on the factors like availability, accuracy, cost and timeliness of information are as in Figure 5.



(mean: 2.08) and cost (mean: 1.92).

5.3 Problems encountered in information access

Figure 6 portrays the problems encountered by the Paramedics in seeking and accessing information.



LT - Lack of time; LB - Language barriers; LCA - Lack of Computer access; NAAL - No access to any library; LAAIR - Limited access or availability of information resources; ISE & NPSI - Information is scattered everywhere and no particular source of information; NTAPI - No training or guidance on how to access professional information

Figure 6: Problems encountered by the Paramedics in accessing professional information
The major barriers faced by the Sri Lankan Paramedics are the limited access or availability of information resources (78.4%) and the lack of time to search for information (64.7%). Further, 37.3% of them also find absence to access for any library as an obstacle in their efforts to search for information.

5.4 Preference for Library

From the responses of these Paramedics, it was apparent that they find no library within their hospital. Also, when inquired about their library usage, 88.2% of them do not seem to be using any library facility outside the hospital. However, 90.2% of them feel that having a library at their hospital with all required information sources would solve their information-related problems.

6. Discussion

6.1 ICT and information searching skills

The above skill levels of the Paramedics are moderate, which might be the cause of efforts made by them and the hospital to enhance their skills. However, this result explains that due importance is not given for them to be information and ICT literate, though they have high interest to enhance their skills via training programmes. The health information professionals in the country, especially those serving the academic institutes, have to support the hospitals in conducting face-to-face or online training sessions or workshops on information searching skills.

6.2 Information needs of the Paramedics

Prakasan (2013) emphasizes the importance given to patient care by healthcare professionals in various researches. Undoubtedly, the vital role of the Paramedics is patient care, for which they frequently search instant information. This contrasts to the purposes of seeking information of Ethiopian healthcare professional, whose main need is personal use and

staying up-to-date (Andualem, Kebede & Kumie, 2013). Similarly, keeping themselves up-to-date has been found to be the main purpose of health professionals of Hong Kong (Cheng & Lam, 1996). As Miriami (2018) claims the latest information should be available for them to attend to new emergency cases and for own needs. Similarly, the respondents of this study reveal that they also need information for keeping themselves up-to-date with the latest developments in their respective fields, which will indirectly help them in intensive patient care on the right time and answering patients' queries, as patients rely more on health information provided by healthcare professionals (Simou, 2016).

On the other hand, higher studies do not seem to be a key purpose for the Paramedics to seek information, which clues that formal higher studies are not mandatory for them, instead they stay well-informed on the innovations by other means. This resembles the findings of Cheng & Lam (1996), where health professionals rank further education as the fourth reason for seeking information. The results of this study further explain that the information needs differ according to their affiliated departments (or subcategories) and to cater the tasks undertaken by them. Therefore, it is essential to understand the information sources used by each category of Paramedics.

6.2 Sources of information

This study reveals that the Paramedics, regardless of their specialized subfields, prefer to use both printed and electronic formats of information. In this technological era, this result indicates that still there is an equal demand for the printed resources among the Paramedics in Sri Lanka, and it was also noted that this result differs from the finding of MSKTC (2010) and Miriami (2018), where health professionals are found to be hardly using the electronic resources. Further, the Sri Lankan Paramedics mainly draw information from the Internet, via communications with their colleagues and from their personal collections. Though these results resemble the outputs of MSKTC (2010), Noguchi, Ogino & Sato (2015) and Stinson & Muller (1980) (as cited by Prakasan (2013)), it contrasts to the findings of Miriami (2018) and Andualem, Kebede & Kumie (2013), where information from the colleagues and electronic resources are hardly used.

Similarly, books and manuals are highly used by Ethiopian professionals (Andualem, Kebede & Kumie, 2013), in comparison to Sri Lankan Paramedics. Likewise, medical journals find rare usage among Sri Lankan Paramedics, resembling their counterparts in Ethiopia (Andualem, Kebede & Kumie, 2013) and Hong Kong (Cheng & Lam, 1996). The results of this study also pinpoint that the Paramedics also find Ministry of Health, Sri Lanka, World Health Organization (WHO) and Medical Research Institute of Sri Lanka useful in satiating their information requirements. Further, another key finding of this study is the set of special information channels for each subcategory. These channels comprise primarily of regulatory bodies, legal bodies/documents, professional websites and the professional associations/societies of different categories of Paramedics identified in this study. Since these are leant to be the heavily used resources, the hospitals can enhance the collaborations with these associations or societies, and increase the information accessibility by supporting the Paramedics in becoming members of the same.

The respondents have high confidence on the accuracy of the information in their field. It is due to the reason that efforts are made to produce good quality research outputs in the field of medicine (European Commission's Scientific Panel for Health, 2016), and the publications go through several quality and standardization processes before those arrive at the hands of the

audience. Similarly, the information received from their senior colleagues are the outcomes of the experience and know-how of several years in their respective subfields, and therefore that knowledge is also considered reliable. Also, the availability of the current information is found to be somewhat good, as the Paramedics now have electronic devices like computers, laptops and mobile phones to access Internet for instant information.

Nevertheless, they do not have satisfactory access for scholarly publications published in the subscription databases. Consequently, they fail to have timely access for various medical research outcomes from different parts of the world, which are mostly published in closed-access or subscription-based e-books or e-journals. Similarly, the medical information sources are usually expensive (Brandon & Hill, 1995), and it may not be always possible for an individual to afford. Some of the resources like databases cannot be individually afforded even by the hospitals in developing countries like Sri Lanka. Hence, this study recommends that the hospitals in Sri Lanka may form consortia and collectively purchase access for the e-resources. The professional associations of the subcategories of the Paramedics in the country may seek access for those costly resources either by purchasing or by mutual collaborations with other global counterparts or with local medical colleges.

6.3 Problems encountered in accessing information

The above limitation in access or availability of information resources is pointed out by the Paramedics as the vital problem in searching information, while the lack of time is the second major issue, which is the key issue explained by MSKTC (2010) as well. Yet, these issues seem to differ from country to country, as Miriami (2018) and Andualem, Kebede & Kumie (2013) show poor network connectivity as the problem in Mizoram and Ethiopia, respectively, while poor searching skills was found to be the hindrance in Hong Kong by Cheng & Lam (1996). In order to overcome the problems identified in this study, the hospital authorities should not only enhance the information accessibility, but also ensure that the Paramedics are motivated to seek information during the working hours. Time limitation can be addressed, when a staff member in each department is made responsible for regularly finding useful information on latest innovations in the field and to share it with the other staff in the department.

Another key solution would be to set up library within the hospital, as preferred by the Paramedics themselves. All the other studies considered above in this discussion such as Cheng & Lam (1996) revealed that the other nations provided library facilities for their Paramedics. A hospital library would solve the problem of time limitation and would increase the habit of using a library among the Paramedics for more reliable, cost-effective and instantaneous information. The library can also open up international information and knowledge sharing networks for the Paramedics via federated database searches, online professional forums, Inter-Library loans, Document Delivery Services and information searching related workshops.

7. Conclusions

The Paramedics in Sri Lanka mainly require information for patient care (76.5%) and staying up-to-date (72.5%), which prompt them to seek information daily and weekly respectively, and their affiliated departments together with tasks-performed exert highly significant influence on their information needs. They prefer to use both printed and electronic forms of information. Though, Internet and knowledge of colleagues are mostly used general

information resources by these Paramedics, their subfield-specific resources find very high usage.

Moreover, lack of time and limited access or availability of information resources are the common problems pointed out by the Paramedics in seeking and accessing information. Further, they do not seem to use any library facility, but they agree that having a medical library within their hospital that is rich in field-specific collections would solve the prevailing issues to a good extent.

The results of this study would be an eye-opener for the respective information providers to support the information needs of the Paramedics by enhancing the availability of information required. Moreover, the knowledge gained via this study would be useful for a comprehensive study on information seeking behaviour of Paramedics involving larger population serving various state and private hospitals of different regions of Sri Lanka. In addition, the outcomes of this study can be applied to other nations in the region, especially to the developing countries, in order to make the Paramedical professionals information-rich.

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