



The Sri Lanka Journal of  
Medical Administration

Official Publication of the College of Medical  
Administrators of Sri Lanka

Volume 20, Issue I  
2018

**Editor**

**Dr. Alan Ludowyke**

**Editorial Board**

Dr. S. A. P. Gnanissara

Dr. Sanath Goonesekera

**Secretariat**

Office of the College of Medical Administrators of Sri Lanka,

Directorate of Healthcare Quality and Safety,

Castle Street Hospital for Women,

Castle Street, Colombo 08.

E - mail : [cmasl2011@gmail.com](mailto:cmasl2011@gmail.com)

website:www.cmasl.lk

**The Sri Lanka Journal of Medical Administration**

**Volume 20, Issue I, 2018**

**Official Publication of the College of Medical Administrators of Sri Lanka**

**ISSN: 1391-2909**

## CONTENTS

<b>EDITORIAL</b>	<b>04</b>
<b>INDUCTION SPEECH OF DR. SUJATHA SENARATNE, PRESIDENT CMASL, 7TH APRIL 2018 AT BMICH, COLOMBO, SRI LANKA</b>	<b>05</b>
<b>ARE SRI LANKAN ADOLESCENTS AT RISK FOR OBESITY?</b> HETTIARACHCHI J, JAYATISSA R, WICKRAMASINGHE SC, WIJEWARDENA K	<b>09</b>
<b>ASSESSMENT OF ACCURACY OF INDOOR MORBIDITY AND MORTALITY RECORDS AT GENERAL HOSPITAL, MATARA AND BASE HOSPITAL, ELPITIYA FERNANDO S</b>	<b>13</b>
<b>IMPROVEMENT OF DOCUMENTS MANAGEMENT AMONG IN CHARGE NURSING OFFICERS OF SELECTED WARDS OF THE NATIONAL HOSPITAL OF SRI LANKA (NHSL)- AN INTERVENTIONAL PROJECT</b> DIAS AADC, DE SILVA C	<b>21</b>
<b>KNOWLEDGE AND PERCEPTION ON MEDICAL ETHICS AND MEDICO-LEGAL DUTIES AMONG GOVERNMENT MEDICAL OFFICERS IN A DISTRICT OF SRI LANKA</b> AMARASINGHE PVNP, WEERASINGHE MC	<b>26</b>
<b>EVALUATION OF THE EFFECTIVENESS OF A MANAGERIAL INTERVENTION TO STRENGTHEN THE HEALTHY ORGANIZATIONAL CULTURE IN THE NATIONAL HOSPITAL OF SRI LANKA</b> DAHANAYAKE LACS, JASINGHE A, OPATHA HHDNP	<b>32</b>
<b>MANAGERIAL ASPECTS AND QUALITY PERCEPTIONS OF OUTSOURCED JANITORIAL SERVICES OF DISTRICT GENERAL HOSPITALS OF GAMPAHA DISTRICT</b> ATTANAYAKE AMH, WICKRAMASINGHE SC	<b>38</b>
<b>MANAGEMENT OF DENGUE OUTBREAK AT LADY RIDGEWAY HOSPITAL FOR CHILDREN (TEACHING) COLOMBO, FROM JANUARY TO JUNE 2017: REPORT</b> WICKREMASINGHE WK, RANAWAKA UMNK	<b>45</b>
<b>SUSTAINED INNOVATION IN HEALTHCARE</b> WIJEMANNE WMUS	<b>49</b>
<b>ASSESSMENT OF KNOWLEDGE AND PRACTICES AMONG DENTAL SURGEONS IN THE INSTITUTE OF ORAL HEALTH MAHARAGAMA, REGARDING QUALITY IMPROVEMENT AND PRODUCTIVITY CONCEPTS AND THE IDENTIFICATION OF BARRIERS FOR IMPLEMENTATION</b> MURAGE C, RAJAPAKSHA RMSP, RUHUNAGE KG, PAHALAVITHANA GU, USGODAARACHCHI U	<b>51</b>
<b>REDUCTION OF NEEDLE STICK INJURIES AMONG NURSES AND HEALTH CARE ASSISTANTS THROUGH AN INTERVENTION: CHANGING ATTITUDE AND IMPROVING AWARENESS, IN THE NATIONAL HOSPITAL OF SRI LANKA (NHSL)</b> PRATHAPASINGHE ID, DHARMARATHNE SD	<b>58</b>

---

## Editorial

---

### **The Fourth Industrial Revolution and Healthcare**

*Dr. Alan Ludowyke, Editor CMASL*

We live in an era of unprecedented rapid technological transformation which fuses the physical, digital and biological worlds by introducing innovative technologies which impact healthcare and challenges the status quo. This will see societal transformation through cyber physical systems, including Robotics, Artificial Intelligence, Block Chain, Nanotechnology, Quantum computing, Biotechnology, Internet of Things, Fifth generation wireless technologies, Additive Manufacturing/ 3D printing/ Bioprinting and even Autonomous vehicles. The line between what is natural and artificial will be unrecognizable to the naked eye.

It is predicted that global health and the healthcare delivery process will significantly benefit from this revolution with the convergence of biological, social and digital systems, through Personalized Medicine, Targeted Therapeutics, Precision cancer care, Next generation diagnostics, Precision Public Health, Disruptive innovations, Big Data in Healthcare, Digital patient, Next Generation Wellness and Moonshots. Such change undoubtedly will bring with it challenges. This is especially so for revolutionary changes involving the lifestyle of mankind and the fundamental alterations that will result in the way we live, work and relate to one another. Lives will be faster, easier and more connected.

At the end, an improvement in the quality of service delivery and patient outcomes should improve and impact the lives of the people by creating a significant step forward in meeting their needs. It will require wise choices in the selection and adoption of the best practices thrown up by the technologies of the fourth industrial revolution. This response needs to be integrated and comprehensive, involving all the stakeholders, from the public and private sectors, to academia and civil society.

The fundamental question lies in our preparation and preparedness in the face of such a future that will change the landscape of healthcare. This would be a future where preventing illness takes precedence over curing, creating healthy living ecosystems and

designing cities for easy access and where people are in charge of their health and choice of healthy diets, all of which would be facilitated by the technological transformations to improve their quality of life. The challenges ahead need to be met head-on with great skill and understanding in order to bring sustainable benefits for all. This will require a concerted global effort and a leap of faith.

---

## Presidential Address

### Induction Speech of Dr. Sujatha Senaratne, President CMASL 7th April 2018 BMICH, Colombo, Sri Lanka

---

**Dr. Tedros, Director General of WHO- Chief Guest, Dr. Poonam Singh, Regional Director WHO – South East Asian Region – Guest of Honour, Hon. Dr. Rajitha Senaratna, Minister of Health, Nutrition and Indigenous Medicine- Guest of Honour, Dr. (Mrs) Neelamane Hewageegana, Immediate Past President of the College, Dr. (Mrs). Champika Wickaramasighe, Secretary of the College, All Past Presidents of the College, Members of the Council and Members, Former Ministers of Health, Secretaries of Health, Director Generals and other distinguished invitees, Ladies & Gentlemen,**

It is indeed a pleasure & privilege to stand in front this august gathering as the 25th President of College of Medical Administrators of Sri Lanka, to deliver my Presidential address. Actually Medical Administration can be compared to rocket science. Rocket science focuses on the high risk levels of space travel resulting in a safe journey while health care aims for safe patient outcomes. However, in both instances, lapses and mistakes can be catastrophic. Our members throughout the history, combining the skills of medicine with the knowledge and training in management, had ensured the highest standards of medical care has been maintained, while at the same time developing a health system which is considered as a role model not only to this region but to the entire world.

Today, 7th of April 2018 is a very significant day to the Sri Lankan Health System as today the World Health Day is celebrated in Sri Lanka. In deciding to hold the World Health Day in Sri Lanka, Dr. Tedros the DG of WHO said “ there is no other country suited for this than Sri Lanka with its high achievements in Health.”

In addition other leading world organizations have expressed the following in relation to our health sector. The World Bank “Sri Lanka achieving pro-poor universal health coverage”. UNICEF “ US newborn survival rate nearly same as Sri Lanka”.

I think all of us who are gathered here, present and past, politicians to practitioners can be justifiably proud of these achievements. You all have contributed for this remarkable success to our health care delivery system.

However, we cannot forever live in the glory of the past.

In this era of Sustainable Development and Universal Health Coverage, bold new ideas and disruptive innovations must be respected, accepted, explored and executed thinking of the future. While learning from global experiences, the above have been implemented in a uniquely Sri Lankan style. We as Medical Administrators have to deliver results swiftly and quickly a rapidly changing environment making sure that no one is left behind. We have to build a health system which is future proof. This is the very reason why we chose the theme “Leading Healthcare in the Fourth Industrial Revolution”.

#### Revolution

Revolution can be defined as “sudden permanent change”. There had been many revolutions in history and there will be more revolutions in the future. Among these revolutions, industrial revolution had a significant impact on mankind.

The First Industrial Revolution in 1784, used water and steam power to mechanize production. All most 100 years later, the second was in 1870 and used electric power to create mass production. The Third in 1969 used electronics and information technology to automate production. Now the Fourth Industrial Revolution is bringing in, “Cyber Physical Systems” to the forefront.

Digital technologies are rapidly transforming daily life for people around the world, in ways never before thought possible. With new levels of mobility and connectivity, and emerging technologies such as

---

artificial intelligence, Big Data analytics, 3D printing and nanotechnology, it is clear that the pace of change will only grow. This “Fourth Industrial Revolution”, where technology is fundamentally changing how we live, work and relate to others.

The dawn of the Fourth Industrial Revolution was recognized at the 2016 World Economic Forum in Davos, Switzerland.

Who is going to benefit most from this Fourth Industrial revolution?

According to the Economist Magazine, it is expected that the health sector will benefit most from the Fourth Industrial Revolution.

In the rest of my address, I have planned to elaborate on how digital disruptions in Fourth Industrial Revolution is going to transform the health system in Sri Lanka and our plan to build a future-proof health system within the next 3-5 years.

#### **First is human resource;**

I am sure that you all will agree with me, that human resource is the most valuable and the least readily available resource in any healthcare setting. We have one of the best health work force in the world. A highly engaged health workforce, can perform miracles. However, sometimes we see that the basic needs of this work force are not sufficiently fulfilled. As the first step, I have initiated a **project to provide better accommodation facilities**. It is expected that this will help to ensure retention of staff at remote and underdeveloped areas in the country. This will strengthen universal health coverage and primary care services.

To keep up with the rapidly changing environment, training is very important. We have planned many training programmes for staff members. The first one be for **post intern medical officers**.

According to a WHO report, eLearning is introduced into the curriculum used for the education of medical students and doctors in over 84% of countries. Universal Health Coverage needs staff with the right skills, and eLearning has the potential to play a significant part in addressing the skills & knowledge gap. Digital platforms such as Massive Open Online Courses, Learning Management Systems will be used for training. We are planning to develop and deploy Enterprise Social Networks for creation of knowledge. The digital transformation often demands not only

technological change but also a re-imagination of roles, skills and culture.

As a first step we are planning to run a family medicine course for Medical officers working in Primary care using a e learning platform. In addition we will use the digital technology to improve the knowledge of our post intern medical officers awaiting to take up posts at various levels of responsibility

The effect of digital disruption, the transformation caused by the emergence of new technology and business models, are having a significant impact on the career trajectories of medical administrators. We need to develop leaders without silos. As the Economist magazine reports, the ability to manage across functions will become a more important leadership skill in the next three years, thanks to digital disruption, and internal networking will be more important in the near future. Therefore as leaders, we have to cooperate rather than compete with each other.

To our junior colleagues, I wish to state that as medical administrators, we are taking part in a relay, not a marathon. Under no circumstances should we think of dropping the baton.

As a new initiative, we have planned to conduct a series of workshops on **operational research** for Medical Administrators as a strategy to strengthen the health system. Prof Chanaka Edirisinghe, a world authority on operational research will be conducting these workshops. Also we are conducting **monthly meetings** to educate our membership with regard to new developments.

#### **Primary care**

Ladies and Gentlemen,

Let me share my ideas about future direction of health care, based on my experience. As a medical administrator I have served in both curative and preventive sectors. My experience as a the Regional Dental Surgeon- Colombo, Director of LRH, D/ Director of NHSL and as the Additional Secretary – Public Health Services, helped me to realize the importance of primary health care.

During this year our college will support the Ministry of Health in the primary care strengthening / reform programs. As some of you may already be aware. The World Bank and the Asian Development Bank will fund programs to strengthen primary health care. The main focus will be on management of Non-Communicable Diseases at primary care level.

---

The college of Medical Administrators will be leading the primary health care re-organization. We will be assisting the Ministry of Health in piloting these reorganizations in two districts. In the pilot every citizen in the district will be issued with a personal Health number and will be assigned to a family care physician at primary care level. A Primary care institution will have a population of around 10,000-15,000. These Primary care Institutions will provide screening and treatment facilities for NCD, in addition to provision of out patient services. In addition these institutions will have facilities for provision of emergency care management. The supportive services will also get developed parallel so a person can get all services under one roof. Only the needy will be referred to a secondary or a tertiary care institution. We are sure the Ministry of Health will consider strengthening of primary care as a priority and provide sufficient number of human resource as Medical officers and nursing officers to implement this all important change. We, the college of Medical Administrators will lead this change and also will be the change agents to make this a real. There will be a strong IT based information backbone to use digital health in this transformation. With use of technology a patient visiting any institution will get continuation of care and the medical records will be available to all treating physicians at all time. It is expected that by 2020 every citizen in the country will have an e-health card.

Now from primary care to personalized medicine. As you all are aware, many drugs and treatments have been developed using a “one size fits all” approach, based on the characteristics of, and responses from, large groups of people. Now precision medicine offers the opportunity to tailor disease treatment to a specific person, by taking into account their genetic and biological makeup, the environment in which they live, and how they live their life. By taking a more tailored approach to health and healthcare – from screening to diagnostics, treatment and cure – we can improve outcomes and potentially lower the costs.

Personalized medicine can very well be used in preventive care. Having identified the mutations in the genome can reduce the impact and delay the onset of diseases like Alzheimer's disease or cancers linked to genetic mutations. Also identifying genome can prevent occurrence of diseases like Thalassemia.

Fourth Industrial Revolution technologies, such as increased computational capacity, sophisticated digital

information platforms and large amounts of genetic and biological data, are powering advances in precision medicine. Governments, industry, academics, civil society and patient groups need to collaborate to ensure that the whole of society is able to benefit from rapid advances in technology and precision medicine

Where do we stand?

As some of you may already be aware, Sri Lankan scientists are leading this field of precision medicine. We had the privilege of meeting some of them and they all agreed to help us in this regard.

Are we talking about a distant future?

Definitely not. The bed rock for personalized medicine is the electronic health records. I am happy to state that our medical administrators are playing lead roles in implementing electronic health records in the country. If all goes well, all institutions will be using electronic health records by the year 2020. We can leapfrog to the future. Also, future medical diagnostic images will all be in digital formats and filmless. This transition from photos to pixels will address the triple bottom line ;i.e. People, Planet and Profits.

The success of this will depend on the collective efforts of different individuals led by medical administrators.

Where do the medical administrators fit in the Fourth Industrial Revolution to lead in healthcare?

Promoting innovation & Research

We all have to accept that all industrial revolutions were brought about by innovations. It has been said that the previous industrial revolution favored those who were “privileged”. i.e those who had labor and capital. But the fourth industrial revolution is completely different from this. To reap the benefits and not be left behind in this era of rapid change, we have to promote innovations both conceptual & experimental.

During this year, the College will establish a Healthcare Management Research and Innovation Centre. This will foster and promote multidisciplinary collaboration in research.

We also will promote, collaborative research and development with the indigenous medicine sector.

As you all know, King Ravana was a great physician. He is credited with the introduction of chemical extraction from plants to prepare medicines and use of heavy metals such as gold for treatment. Even today this practice is continued as “Rankiri kata gama”

---

The ancient wisdom such as these, can be researched in depth with the technologies brought about by the Fourth Industrial Revolution.

We are also planning to support research in personalized medicine, gene therapy and stem cell research. This may sound ambitious and high tech but all are within our reach.

Power of computing will enable big data analytics where n=all. We will be always in beta mode as there will continuous evolution.

To promote research and innovation, I would like to recommend to you to read “Originals”, a book by Adam Grant. This describes how non conformities are changing the world. This is very true for this era of revolution and innovation.

Fourth industrial revolution & Sustainable Development Goal (SDG)

Achievement of SDG need to be carefully monitored. Quality data will be the key. Use of Artificial intelligence will have a real benefit.

#### Policy impacts

While new products and services are routinely rolled out, governments try to keep pace with these new technologies. This requires regular overhauling all aspects of health care. While governments are trying to carefully measure and mitigate their impacts, citizens are eager to reap benefits.

What is needed is a new era of agile governance. A policymaking that is adaptive, human-centered, inclusive and sustainable. Policy development is no longer limited to governments but rather is an increasingly multi-stakeholder effort. Therefore policy making need to be;

Focused on achieving policy goals rather than check-the-box regulatory compliance;

Open to new information and drawing on elements like data-driven government and pilot programmes, and willing to change if goals are not met;

Open to input from a wider group of stakeholders and grounded in transparency.

#### Management challenges

The Fourth Industrial Revolution will bring many challenges to healthcare leaders. The important ones would be;

1. Adapting to the ongoing digitization of healthcare industry
2. Dealing with digitally empowered customers (both internal & external)
3. Provision of superior service to those with sufficient knowledge and alternatives.
4. Managing digital disruptions
5. Making strategic decisions on digital technologies
6. Promoting and managing innovation both conceptual and experimental
7. Making necessary changes across the health system

Finally, I have a lot of people to thank for nurturing and caring for making me the person today. First I would like to thank my parents. My mother and my brothers and sisters looked after me very well and always were with me and guided me since my father left us when I was small.

Then my teachers in school and in university of Peradeniya and Postgraduate Institute of Medicine taught me well and in addition to knowledge in subject matters, they taught me life skills and how to live in a society with people of different ideas and views.

Then I met my husband Dr. Rajitha Senaratne and He was beside me all my life supporting and encouraging me. As experienced by all of us there were many ups and downs in our lives. We faced them together and we both helped and encouraged each other. My two sons Chathura, and Sesath and my daughters in law, I have no words to thank you. There were times you have rarely seen me. When I worked as a Hospital Director. I stayed in the quarters and worked the whole time. You all understood me and encouraged me to work for the people. Thank you very much.

Then I would like to thank my council for organizing this event and I am confident that with your support we could achieve what we have planned.

Thank You

---

## ARE SRI LANKAN ADOLESCENTS AT RISK FOR OBESITY?

Hettiarachchi J<sup>1</sup>, Jayatissa R<sup>2</sup>, Wickramasinghe SC<sup>3</sup>, Wijewardena K<sup>4</sup>

---

### Abstract

**Objective:** To describe the prevalence of overweight/obesity among adolescent school children in the Colombo education zone.

**Design:** Cross-sectional descriptive study

**Setting:** School based.

**Participants:** Sample of 1728 students representing all schools in Colombo education zone were selected using multi-stage cluster sampling method.

**Main outcome measures:** Prevalence of overweight/obesity among adolescent school children

**Results:** Prevalence of over weight and obesity among adolescents were revealed as 10.8% with no gender difference. Adolescents studying in semi-government and international schools (OR 2.62) were about three times overweight and obese than those studying in government schools.

**Conclusions:** Adolescent over weight and obesity is highly prevalent among school children in the Colombo education zone

### Introduction:

Adolescence period begins with the onset of physiologically normal puberty, and ends when an adult identity and behaviour are accepted. This period of development considered as ages between 10 to 19 years (WHO, 2012). Population of Sri Lanka consists of approximately twenty-two million people and 19% of them are adolescents.

Government Schools are categorized as type1AB, type1C, type 2 and 3. According to the Ministry of Education (2005), schools having the advanced level science stream are categorized as type 1AB while schools having art and/or commerce stream but no science stream are categorized as type 1C. In the same classification, type 2 schools have classes only up to grade 11, whereas type 3 schools have classes only up to grade 5. Other than government schools, there are international and semi-government schools in Sri Lanka and most of them are in the Colombo District.

Adolescents during puberty show the highest growth rate in life after infancy and childhood. Therefore, lack of attention to an adolescent's nutrition can lead to malnutrition and many diseases related to nutrition. Overweight and obesity is the emerging trend in adolescent malnutrition in urban areas which results in many problems in adult life.

Among adolescents, the BMI for age is used to classify over weight and obesity. Obesity is defined as BMI for age more than +2SD and overweight is defined as BMI for age +1SD to +2SD (WHO, 2007).

Obesity is a complex condition which has serious social and psychological dimensions as well as a risk factor for non-communicable diseases including diabetes mellitus, hypertension and cardiovascular diseases (Majundar, 2002).

In developing countries as a result of the broad socioeconomic changes including rapid urbanization and industrialization a considerable nutrition transition was observed with an increase in overweight and

---

<sup>1</sup>Consultant Community Physician, Ministry of Health, Sri Lanka

<sup>2</sup>Consultant Community Physician, Head, Nutrition unit, Medical Research Institute, Sri Lanka

<sup>3</sup>Deputy Director General (NCD), Ministry of Health, Sri Lanka

<sup>4</sup>Senior Professor in Community Medicine, Faculty of Medicine, University of Sri Jayawardenapura, Sri Lanka

---

obesity prevalence (WHO, 2002). Sri Lanka is one of the developing countries which showed rapid urbanization during the past few decades. Although undernutrition is a common problem in rural Sri Lanka, over weight and obesity are the emerging problems in urban areas. It was revealed that in 1995 dietary factors, especially overweight related chronic diseases accounted for 18.3% of all deaths in Sri Lanka and this is much higher in urban areas (E-Siong, 2002).

Although obesity in adolescents results in several adult life problems, policy makers and health planners of the country have not paid much attention to their problems due to low mortality and morbidity in this age group. There are very few studies conducted on adolescent overweight and obesity prevalence in Sri Lanka, and no recent study has been conducted. On the other hand, factors associated with overweight and obesity among adolescent school children may be different from the general population and not properly studied. As Sri Lanka is a country with rapid urbanization and industrialization, overweight and obesity prevalence increases annually and the Colombo being the most urbanized city in Sri Lanka is expected to have the highest prevalence of over weight and obesity (Department of Census and Statistics, 2011). Therefore, this study plans to detect overweight and obesity prevalence in 14 to 15 year-old adolescents in Colombo education zone.

### Objective

To estimate the prevalence of overweight and obesity prevalence among 14 to 15- year-old school children in the Colombo education zone.

### Methodology

A school-based cross-sectional descriptive study was carried out.

Permission for the study was sought from the Ministry of Education and informed consent to collect data was obtained from each selected child's parents before the study by sending an information sheet and consent form to the relevant parent through their children. Ethical clearance for the study was obtained from the Ethical Committee of the University of Sri Jayawardenepura .

Sample of 1750 adolescent school children was selected utilizing a multi-stage cluster sampling technique considering class as a cluster. The number of clusters was divided among four categories of schools (type 1AB, type 1C, type 2 and international and semi government school category) proportionate to the total student population in grade 9 and 10 in each category of school

Weight and height of all the subjects were measured according to the standard procedures using standard equipment by the Principal Investigator (PI). For measuring height, a stadiometer was used and measurements were made to the nearest one centimeter. Weight was measured by electronic digital weighing scale (Seca ©, France) to the nearest 0.1kg. Name, sex and the age of each student were recorded at the time of weight and height measurements.

BMI calculated using WHO BMI for age calculations (WHO 2007) and prevalence of overweight and obesity was calculated using SPSS statistical package.

### Results

One thousand seven hundred and fifty subjects were selected for the study and 1728 responded. Therefore, response rate of this study population was 98.7% which can be considered as a good response rate for a prevalence study.

Weight and height of all the subjects were measured according to the standard procedures using standard equipment by the PI.

**Table 1. Anthropometric measurements of the study population**

Characteristics	Male (n=801)		Female (n= 927)		Total (n=1728)	
	Mean	SD	Mean	SD	Mean	SD
Height	1.56m	0.09	1.55m	0.84	1.56m	.088
Weight	45.91kg	10.87	46.25kg	10.10	46.09kg	10.45
BMI	18.87	4.03	19.19	3.99	19.04	4.01

Mean weight and the BMI were higher among females but the mean height is more in males. Mean BMI of the adolescents in the study group was 19.04 (SD 4.01)

The study population was categorized according to the nutritional status and it is shown in Table 2.

**Table 2: Categorization of study population according to nutritional status**

Nutritional status	Male (n=801)		Female (n=927)		Total (n=1728)	
	No.	%	No.	%	No.	%
Obese	32	4.0	36	3.9	68	3.9
Over weight	55	6.9	63	6.8	118	6.8
Normal weight	482	60.1	611	65.9	1093	63.3
Underweight	166	20.7	159	17.1	325	18.8
Severe underweight	66	8.2	58	6.3	124	7.2
Total	801	100	927	100	1728	100

More than half of the study population was in the normal weight category (63.3). One fourth of the study population was under weight or severe underweight. Among the males 8.2% of population was severe underweight. About one tenth (10.7%) of the study population were overweight and obese whereas 3.9% of them are obese. Over weight and obese adolescents were categorized according to type of school and shown in table 3.

**Table 3: Over weight and obesity in relation to type of school**

	Overweight & obesity						Significance
	Present		Absent		OR	95% CI of OR	
	No.	%	No.	%			
<b>Type of School</b>							
Type 1Ab	106	11.7	798	88.3			$\chi^2 = 31.7$
Type 1C	16	4.6	329	95.4			df = 1
Type 2	10	4.6	207	95.4	1		p=0.000
Semi-government and international	54	20.6	208	79.4	2.62	1.82-3.77	
<b>Age</b>							
14 yrs	95	10.4	819	89.6	1		$\chi^2 = 0.277$
15 yrs	91	11.2	723	88.8	1.09	0.79-1.49	df = 1 p=0.599
<b>Sex</b>							
Male	87	10.9	714	89.1	1		$\chi^2 = 0.015$
Female	99	10.7	828	89.3	0.98	0.72-1.35	df = 1 p=0.903
Total	186	10.8	1542	89.2			

---

Overweight and obese Adolescents in Semi-government and international school were statistically significant ( $p=0.000$ ). Adolescents age and sex were not significantly associated with the overweight and obesity.

### **Discussion:**

All types of schools in the Colombo district were included in the sample and the study sample was selected proportionate to the number of grade 9 and 10 students in each category of schools. This provided a representative sample from each type of school.

The study sample also consisted of 52.9% grade 9 students and 47.1% grade 10 students. The percentage of females in the study population was 53.6% and males 46.4%. Therefore, both age groups as well as both sexes were almost equally assessed in the present study.

Among the study group the prevalence of overweight and obesity was 10.8%, indicating that overweight and obesity among adolescents is a public health problem in urban cities like Colombo. A previous study was done in the same setup in 1988 with 690 adolescent school children of 11 to 16 years of age from nine urban schools which showed prevalence of overweight as 15.2% (Piyasena et al., 1998). But the difference in prevalence in the above two studies maybe due to Piyasena et al using only nine urban schools that may not represent whole categories of schools in the Colombo education zone.

A nationwide study done in Sri Lanka in 2001 showed the prevalence of overweight as 4.9% while obesity was 1.1% (Piyasena and Mahamiththawa., 2003). In a nationally representative cross-sectional study which was conducted in Sri Lanka in 2006 among 6,264 adolescents 10 to 15 years of age using the International Obesity Task Force, the age and sex-specific reference for body-mass revealed the prevalence of overweight as 2.2% (Jayatissa and Ranbanda 2006). This difference was due to the city of Colombo being the highest urbanized city in Sri Lanka and it has a higher prevalence of overweight and obesity compared to other parts of the country.

When considering the world situation, developed countries showed higher prevalence of overweight and obesity than other parts of the world. Studies done in Malta and the USA in 2003 showed one fourth of children aged 10 to 16 years are overweight (WHO, 2005), while another study done among 1548 primary school children in 2006 in Glasgow to determine the prevalence of overweight and obesity showed 31.4 %

were overweight, 19.1 % were obese and 12.4 % were severely obese (Hughes et al, 2006). But according to the Bhave, 2006 India national data mostly from school based or co-morbidity oriented surveys, the prevalence of overweight and obesity ranges from 6 to 8% indicating that countries with higher development showed high prevalence of overweight and obesity. All above researches show that developed countries had higher obesity prevalence than developing countries. Therefore, higher prevalence of overweight and obesity can be expected in the city of Colombo when compared to other parts of the country as it the most developed city in Sri Lanka.

### **Conclusion**

The overall prevalence of over weight and obesity among 14 to 15 year-old adolescent school children in the Colombo education zone was 10.8% with no gender difference

Key words: Over-weight and obesity, Prevalence, Colombo education zone

---

## ASSESSMENT OF ACCURACY OF INDOOR MORBIDITY AND MORTALITY RECORDS AT GENERAL HOSPITAL, MATARA AND BASE HOSPITAL, ELPITIYA

Fernando GHS<sup>1</sup>

---

### Abstract

**Introduction:** Indoor Morbidity and Mortality Record (IMMR) forms the backbone of data in the evaluation of the health status of a country. The International Classification of Diseases (ICD) is the standard diagnostic tool used for epidemiology, health management and clinical purposes. Due to the widespread use of ICD code system in making important funding, clinical and research decisions, increased attention has been given to code accuracy.

**Objective:** To assess the accuracy of Indoor Morbidity and Mortality Records at General Hospital, Matara and Base Hospital, Elpitiya.

**Methodology:** This was a descriptive cross-sectional study. Randomly selected 422 Bed Head Tickets (BHTs) were assessed using a pre-tested checklist. Determination of accuracy of the eIMMR was based on the accuracy of coding according to the ICD-10.

**Results:** Only 62.5% (240) of the diagnosis of patients were compatible with the code entered in the eIMMR, giving an accuracy rate of around 62.5%.

**Conclusions and recommendation:** Accuracy of the ICD coding was less. By implementing regular awareness programs, the accuracy could be improved.

### Introduction

Indoor Morbidity and Mortality Record (IMMR) forms the backbone of data in the evaluation of the health status of a country<sup>1</sup>. Information on diseases is collected according to the International Classification of Diseases-10 (ICD-10). The ICD is the standard diagnostic tool used for epidemiology, health management and clinical purposes<sup>1</sup>.

Increased attention is given to code accuracy since the ICD coding is used widely to make important funding, clinical and research decisions<sup>2</sup>. The accuracy or the uncertainty of diagnosis depends upon multiple factors such as the participants (Patients, Clinicians/Medical staff), disease type, current state of medical knowledge and technology, context within which the diagnosis is made, and translation of coding changes into practice<sup>2</sup>.

Good quality healthcare data play a vital role in the planning, development, and maintenance of healthcare services. Quality health records are essential for the maintenance of optimal healthcare<sup>3</sup>. Improving the quality of healthcare data in patient health records can affect clinical and administrative decision making in many ways<sup>4</sup>. It can impact on health economics, increase patient safety, provide evidence to support clinical decision making through healthcare research, improve the information provided to patients on their illness and care, and the effectiveness of clinical care pathways.

The theory of disease classification began in the 17th Century by John Graunt and the 1st statistical study of disease, the London Bills of Mortality<sup>5</sup> was released during the 18th Century<sup>5</sup>.

The French physician Jacques Bertillon further developed the classification of Graunt and Sauvages and introduced the Bertillon Classification of Cause of Death<sup>2</sup>. This was recommended as the classification system and named as the International Classification of Cause of Death and revised every ten years. The revision of ICD-10 has a greater specificity than ICD-9 and includes 21,000 total codes<sup>6</sup>.

---

<sup>1</sup>Deputy Director, Teaching Hospital, Karapitiya.

---

The Electronic based system was started in Sri Lanka in 2010, but its accuracy has not been evaluated as yet.

### Objective

To determine the accuracy of ICD-10 coding of morbidity recording in eIMMR at DGH Matara and BH Elpitiya.

### Methodology

A descriptive cross-sectional study was conducted at DGH Matara and BH Elpitiya during a one-month period from 1st to 30th January, 2017. BHTs of the patients who were discharged during the first quarter of 2016 from DGH Matara and BH Elpitiya and entered in the eIMMR were included in this study. BHTs not entered in the e-IMMR and not sent to the record room were excluded. For this study, the sample size was calculated with the assumption of accuracy as 50%. DGH Matara and BH Elpitiya were selected for the study considering the convenience of the Principal Investigator (PI). Four hundred and twenty-two (422) BHTs were selected from both hospitals using the systematic random sampling technique. The sample sizes for BH Elpitiya and DGH Matara were 158 and 264 respectively. A pre-tested check list was used as the study instrument to assess the accuracy of ICD coding.

The check list included:

Basic data such as BHT number, Date of Admission, Date of Discharge and ward number.

Data needed to assess the accuracy was the availability of the following: diagnosis in the 1st page, consultant's diagnosis, detailed diagnosis, informative diagnosis, clear diagnosis, type of diagnosis, availability of code in the BHT, compatibility of code with the diagnosis, completeness of the diagnosis, time of receipt of BHT in record room and time BHT was uploaded to the eIMMR. Check list was face and content validated after discussion with the supervisor and the experienced MRO in the DGH Matara. Ethical approval was obtained from the Ethical Review Committee, Faculty of Medicine, University of Colombo. Data were entered to an Excel sheet daily by the PI. Data were computed and analyzed using Excel and Statistical Package for the Social Sciences (SPSS). Percentages, rate, proportions were calculated wherever necessary. Chi- squared test was used to determine the statistical significance of association between variables.

### Results

**Table 1. Number of BHTs checked from each Hospital**

<b>Hospital</b>	<b>No. of BHTs checked</b>	<b>Missing BHT</b>
DGH. Matara	252(95.4%)	12
BH. Elpitiya	152(96.2%)	06
<b>Total</b>	<b>404(95.7%)</b>	<b>18</b>

Table 1 shows the number of BHTs checked from each hospital. Availability rate was 95.4% in DGH Matara and 96.2% in BH Elpitiya. Overall rate was 95.7%.

---

**Assessment of the accuracy of the codes**

**Table 2. BHT with the diagnosis written on the 1st Page**

BH Elpitiya		DGH Matara*		Total	
Diagnosis		Diagnosis		Diagnosis	
Present in first page (%)	Absent in first page (%)	Present in first page (%)	Absent in first page (%)	Present in first page (%)	Absent in first page (%)
129(84.8)	23 (15.2)	170(73.3)	62 (26.7)	299(77.9)	85 (22.1)

---

\*20 BHTs from DGH Matara had the 1<sup>st</sup> page missing

Table 2 indicates the percentage availability of diagnosis in the 1<sup>st</sup> page of the BHT.

**Table 3: Percentage BHT with diagnosis made by Consultants**

BH Elpitiya		DGH Matara		Total	
Diagnosis present (%)	Diagnosis absent (%)	Diagnosis present (%)	Diagnosis absent (%)	Diagnosis present (%)	Diagnosis absent (%)
95 (64.1)	53 (35.9)	77 (33.2)	155(66.8)	172(45.2)	208(54.8)

---

If the diagnosis of the patient was given by the Consultant, the accuracy is much higher. Table 3 indicates the availability of Consultant diagnosis in the BHT, which is not necessarily on the 1st page. Only 45.2% BHTs were with the consultant's diagnosis in both hospitals.

**Table 4. BHT with abbreviated diagnoses**

BH Elpitiya		DGH Matara		Total	
Diagnosis given in detail (%)	Diagnosis with abbreviations (%)	Diagnosis given in detail (%)	Diagnosis with abbreviations (%)	Diagnosis given in detail (%)	Diagnosis with abbreviations (%)
68(51.1)	65 (48.9)	97(55.7)	77 (44.3)	165(53.7)	142 (46.3)

Table 4 gives the number of BHTs with the abbreviated diagnoses. Of the total, 46.3% of the diagnoses had been written in shortened form.

**Table 5. BHT showing the completeness of the diagnosis**

BH Elpitiya		DGH Matara		Total	
Diagnosis		Diagnosis		Diagnosis	
Complete (%)	Incomplete (%)	Complete (%)	Incomplete (%)	Complete (%)	Incomplete (%)
88 (64.0)	49 (36.0)	60 (29.0)	147 (71.0)	148 (43.0)	196 (57.0)

Of the total BHTs, only 43.0% had the complete diagnosis, whereas 57.0% of the diagnosis were incomplete.

**Table 6. BHT showing principal diagnosis in 1st Page**

BH Elpitiya		DGH Matara		Total	
Principal Diagnosis		Principal Diagnosis		Principal Diagnosis	
in 1 <sup>st</sup> page (%)	Not in 1 <sup>st</sup> page (%)	in 1 <sup>st</sup> page (%)	Not in 1 <sup>st</sup> page (%)	In 1 <sup>st</sup> page (%)	Not in 1 <sup>st</sup> page (%)
118 (81.3)	27 (18.7)	138 (61.9)	85 (38.1)	256 (69.6)	112 (30.4)

Table 6 shows percentages of availability of principal diagnosis in the 1st page. Principal diagnosis was found on the 1st page only in 69.6% of BHTs. The principal diagnosis is the main diagnosis that the patient was treated for. Some clinicians have written other conditions of the patient as the principal diagnosis in the 1st page.

---

**Table 7 BHTs showing the legibility of the written Diagnoses**

DGH Matara		BH Elpitiya		Total	
Legible (%)	Illegible (%)	Legible (%)	Illegible (%)	Legible (%)	Illegible (%)
123 (91.7)	49 (36.6)	85 (63.4)	05 (1.25)	172 (64.2)	96 (35.8)

---

Table 7 indicates the availability of readable diagnosis in the BHT which directly affects the accuracy of the code. Out of the total BHTs, 64.2% were legible and 35.8% were illegible.

**Table 8.1 Types of Diagnosis in the BHT- DGH Matara**

	(%)
Definitive Diagnosis	96 (41.3)
Signs and Symptoms	86 (37)
Laboratory investigation	17 (7.3)
Procedure	8 (3.4)
Treatment	5 (2.2)
Undiagnosed	20 (8.6)
Total	232( 100)

**Table 8.2 Types of Diagnosis in the BHT-BH Elpitiya.**

Type of diagnosis	(%)
Definitive Diagnosis	89 (58.6)
Signs	34 (22.4)
Laboratory investigation	6 (3.9)
Procedure	4 (2.6)
Treatment	5 (3.3)
Undiagnosed	14 (9.2)
Total	152(100)

---

Table 8.1 & 8.2 show the types of diagnosis in the two hospitals. The definitive diagnosis in BHTs of BH Elpitiya was higher (53.6%) than DGH Matara (41.3%).

**Table 9: Percentage of the BHT coded by the Medical Record Officer(MRO)/Assistant Medical Record Officer(AMRO)**

BH Elpitiya		DGH Matara		Total	
Coded (%)	Not coded (%)	Coded (%)	Not coded (%)	Coded (%)	Not coded (%)
148(97.3)	4 (2.7)	219(94.3)	13 (5.7)	367(95.6)	17 (4.4)

MRO/AMRO selects and enters the code according to the diagnosis in the BHT before uploading to the eIMMR. Coding in general is around 95% in both hospitals.

**Table 10 Compatibility of the coded diagnosis with actual diagnosis (Based on Coding by PI)**

BH Elpitiya		DGH Matara		Total	
Coded diagnosis		Coded diagnosis		Coded diagnosis	
Compatible (%)	Not compatible (%)	Compatible (%)	Not compatible (%)	Compatible (%)	Not compatible (%)
82 (55.0)	67 (45)	158 (65.0)	85 (35.0)	240 (62.5)	152(37.5)

Although the MRO coding in general was 95%, the PI found that about 37.5% were incompatible.

**Table 11 Showing the completeness of the compatible Code**

BH Elpitiya		DGH Matara		Total	
Complete (%)	Incomplete (%)	Complete (%)	Incomplete (%)	Complete (%)	Incomplete (%)
55 (67.0)	27 (33.0)	146 (92.4)	12 (7.6)	201 (83.7)	39 (16.3)

Although the coding was compatible with ICD-10, 16.3% of the coding was incomplete.

---

## Discussion

In this study 404 BHTs were evaluated in detail using a pre-tested check list by the investigator to assess the accuracy of ICD coding. The systematic random sampling technique was used to select 252 BHTs from DGH Matara and 152 BHTs from BH Elpitiya.

According to the results, a total of only 299 (77.9 %) BHTs had the diagnosis written in the 1st page. Therefore, even though MROs have the competency in selecting the correct code for the available diagnosis, the absence of diagnosis in the first page makes it difficult for them to code the BHTs and delays sending information to the end users. However, BH Elpitiya (84.8%) was much better than the DGH Matara (73.3%) in writing the diagnosis in the front page. Clinicians do not generally assign codes, coders assign them based on the diagnosis recorded in the first page of the BHT. A study done in England<sup>7</sup> has reported errors in this stage that range from 17.1 to 76.9%.

Diagnostic accuracy depends on the scientific understanding regarding various presentations and etiologies of the disease<sup>2</sup>. Many studies conducted on the accuracy of ICD code consider the physicians' diagnosis as recorded in the medical record as the gold standard for measuring diagnosis<sup>8,7,9</sup>. However, this study found that only 45.2% (172) BHTs were diagnosed by the consultant.

One potential set of errors can be found in the record itself. When the clinicians write the diagnosis in the front page using synonyms and abbreviations to describe the same condition, it affects the accuracy of the code<sup>8</sup>. This study showed 46.3 % (142) of the diagnoses has been written using abbreviations.

In order to set the correct and complete code, the diagnosis has to be an informative one. As an example, a diagnosis may be given as Asthma which gets coded as J45.9, whereas if it is Acute Severe Asthma the code should be J46. According to the finding of this study 196 (57%) diagnoses were less informative. This incompleteness directly affects the accuracy of the code.

Some patients had been treated for illnesses other than the main illness. eIMMR software used in Sri Lanka has no facility to include more than one diagnosis for the same patient. In this situation a clinician must write the principal diagnosis in the 1st page of the BHT. However, according to the analysis 112 BHTs(30.4%) the principal diagnosis was not written on the first page as a result of which the coding was not done according to the principal diagnosis.

Illegible handwriting also directly affects the coding

process (Kimberly, 2005). In this study 96 (35.8%) diagnoses had been written illegibly.

Coders being non-medical officers, write the codes according to the diagnosis given in the 1st page of the BHT, before uploading to the eIMMR. Many potential errors originate with the coder<sup>2</sup>. A study has revealed coding variance was found with the different coders in more than half of the medical records<sup>8</sup>. In this study, 367 (95.6%) medical records were given codes according to the diagnosis given in the BHT. Rest of the BHTs did not have a code and were not entered to the eIMMR.

In this study each code was re-evaluated by the investigator using the three volumes of the ICD- 10. According to this study, 240 (62.5%) codes were compatible with the actual principal diagnosis of the patient treated in the hospital. Rest of the codes 152 (37.5%) were not compatible with the actual diagnosis. Many research studies have shown a wide range of errors in the coding process. Many studies<sup>10,11,12,13,7</sup> have found that error rates of the coding range from 20 - 80%. Some studies<sup>7,9,14,15,16,17</sup> done in several countries found that the error rate ranges from 0 to 70%. The error rate of this study is more or less similar (37.5%) to the other studies mentioned above.

In this study even though the codes are correct they were incomplete. As an example, the Code given for shortness of breath was R06, which is abnormal breathing in Volume 1 of the Code. However, this is an incomplete Code. The correct and complete Code for shortness of breath is R06.0. In this study 75 (25.5%) such codes were incomplete and affect the accuracy of the code. The error rate was higher due to incorrect diagnosis given in the 1st page of the BHT. In the analysis, the main reasons found for the inaccuracy of the coding was due to incorrect diagnosis.

## Conclusions

According to the assessment 37.5% of the diagnoses were not compatible with the code. That means the patient's actual treated condition in the hospital is not represented by the code. Incorrect diagnosis written in the front page by the house officers, not having consultant diagnosis in the BHT, diagnosis not written in the front page, unclear diagnosis, use of abbreviations in the diagnosis, keeping BHTs in the ward without writing diagnosis, less informative diagnosis, incorrect coding by the record officers were found to be directly affecting the accuracy of the coding.

---

## Recommendations

1. Regular monitoring has to be conducted through the medical statistic unit of the hospital to assess the accuracy of the ICD coding.
2. Guidelines and circulars must be issued at the ministry level to improve the efficiency of the medical record officers.
3. Regular training should be conducted for the relevant staff.

## References

1. Kariyawasam, n., Wickramasinghe, s. c., Dayaratne, m. k. d. r. b. & Sylva, k. k. p (2013). Comparison of Electronic and Paper Based Indoor Morbidity and Mortality Reporting System. International Conference on Public Health Innovations, 2013b Kalutara. National Institute of Health Sciences Sri Lanka.
2. Kimberly J., O'Malley, Karon F., Cook, Matt D., Price, Kimberly Raiford Wildes, John F., Hurdle and Carol M. Ashton (2005). Measuring Diagnoses: ICD Code Accuracy. *Health Research and Educational Trust*. DOI: 10.1111/j.1475-6773.
3. Kerr K.A., Norris T., Stockdale R. (2008) The strategic management of data quality in health care. *Health Informatics J*; 14:259–66 [PubMed].
4. Donald AO., (2002) The impact of feedback to medical house staff on chart documentation and quality of care in the outpatient setting. *J Gen Intern Med*; 12:352–6 [PMC free article] [PubMed].
5. National Center for Classification in Health (2008). ICD-10 Morbidity and Mortality Coding Work Book. Vol. 9.
6. Department of Veterans Affairs (2002). Handbook for Coding Guidelines, Version 2.0. Health Information Management. Available at <http://www.virec.research.med.va.gov/References/VHACodingHandbook/CodingGuidelines.htm>
7. Hsia D.C., Krushat W.M, Fagan A.B, Tebbutt J.A and Kusserow R.P. (1988). Accuracy of Diagnostic Coding for Medicare Patients under the Prospective-Payment System. *New England Journal of Medicine*. 318 (6): 352–25.
8. Lloyd S.S and Rissing J.P (1985). Physician and Coding Errors in Patient Records. *Journal of the American Medical Association*. 254 (10): 1330–6.
9. Fischer E. D., Whaley F.S., Krushat W.M., Malenka D.J., Fleming C., Baron J.A and Hsia D.C., (1992). The Accuracy of Medicare's Hospital Claims Data: Progress Has Been Made, but Problems Remain. *American Journal of Public Health* 82: 243–8.

10. Institute of Medicine (1977) Reliability of Hospital Discharge Records. Washington, DC: National Academy of Sciences.
11. Corn R.F., (1981). The Sensitivity of Prospective Hospital Reimbursement to Errors in Patient Data. *Inquiry*. 18: 351–60.
12. Doremus H D and Michenzi E.M., (1983). Data Quality: An Illustration of Its Potential Impact upon Diagnosis-Related Group's Case Mix Index and Reimbursement. *Medical Care* 21: 1001–11.
13. Johnson A.N and Appel G.L. (1984). DRGs and Hospital Case Records: Implications for Medicare Casemix Accuracy. *Inquiry*. 21: 128–34.
14. Jolis, J.G., Ancukiewics M, DeLong E.R., Pryor D.B., Muhlbaier L.H and Mark D.B (1993). Discordance of Databases Designed for Claims Payment versus Clinical Information Systems. *Annals of Internal Medicine*. 119: 844–50.
15. Benesch C., Witter D.M., A. L. Wilder P. W., Duncan G. P, Samsa, and D. B. Matchar D.B., (1997). Inaccuracy of the International Classification of Diseases (ICD-9-CM) in Identifying the Diagnosis of Ischemic Cerebrovascular Disease. *Neurology*. 49: 660–4.
16. Faciszewski T., Broste S.K and Fardon D (1997). Quality of Data Regarding Diagnoses of Spinal Disorders in Administrative Databases. A Multicenter Study. *Journal of Bone Joint Surgery America* 79: 1481–8.
17. Goldstein L. B., (1998). Accuracy of ICD-9-CM Coding for the Identification of Patients with Acute Ischemic Stroke: Effect of Modifier Codes. *Stroke*. 29 (8): 1602–4.

---

# IMPROVEMENT OF DOCUMENTS MANAGEMENT AMONG IN CHARGE NURSING OFFICERS OF SELECTED WARDS OF THE NATIONAL HOSPITAL OF SRI LANKA (NHSL)- AN INTERVENTIONAL PROJECT

*Dias AADC<sup>1</sup>, De Silva C<sup>2</sup>*

---

## Abstract

**Introduction:** With other relevant duties and responsibilities, proper document management contributes to efficient and effective health care service. In relation to general administration of hospital wards, in charge nursing officers' function as middle level managers. Therefore, proper document management among ward in charge nursing officers is an essential prerequisite for a proper health care service.

**Objective:** This interventional study focused on improving the documents management among in-charge nursing officers of selected wards of the National Hospital of Sri Lanka (NHSL).

**Methodology:** Both qualitative and quantitative techniques were applied for this study. Knowledge, Attitude and Practices on document management which were described under five variables namely Availability, Accessibility, Protection, Level of updating and Readability were measured at pre- and post-interventional levels. The intervention consisted of training sessions, introduction of a guideline and administrative intervention. Finally, total document management was also measured.

**Results:** Results showed that the mean score for Knowledge was increased from 68 to 81, while Attitude was increased from 61 to 68. The mean score on Availability was increased from 90 to 92 and Accessibility was increased from 56 to 62. The mean scores on Protection, Level of updating and Readability were increased from 48 to 53, from 57 to 66, and from 94 to 95, respectively.

*(Key words: Document management, In charge nursing officers, NHSL)*

## Introduction

Proper document management is an important requirement for maintaining an efficient and effective health care service. In keeping with its importance, document management at hospital level involves a variety of documents such as records, formats, guidelines and operating in compliance with legal and administrative requirements. Hospital wards can simply be defined as specific areas of a hospital shared by patients who need a similar kind of care. The National Hospital of Sri Lanka (NHSL) is the largest health care institution in Sri Lanka which is having nearly 3300 beds, 7500 workforce and 81 wards<sup>1</sup>.

Among many stake holders involving in ward level functions, Nursing Officers (NOs) are considered as a very important contributor for proper ward function. Further, they function as the bridge between Medical Officers and patients<sup>2</sup>. One qualified nursing sister, master or a senior nursing officer from these NOs is appointed as the responsible person for general administration of the ward and is known as the ward-in-charge. Being the responsible officer for the management of physical as well as some human resources (nurses and minor staff) of the ward, the In-charge Nursing Officer is recognized as a middle manager or operational manager at the ward level. Document management is an integral component of record management system of the hospital which is described as the management of generated records and documents. Proper document management with other relevant factors contribute immensely to increase the quality and productivity of the health care service. This could therefore be considered as the back bone of proper management due to its relevance as a source of information. Availability, Accessibility, Protection, level of Update and Readability have been identified as the factors affecting proper document management at institutional level<sup>3,4</sup>.

In the current context, training programmes for nursing officers at the Nurses Training Schools (NTS) and Post-

---

<sup>1</sup>Senior Registrar in Medical Administration

<sup>2</sup>Deputy Director, National Hospital of Sri Lanka

---

Basic School of Nursing (PBSN) are focused only on some isolated elements of document management such as general appearance, inventory maintenance, etc. Additionally, instructions have been given in the Establishment Code, circulars of the Ministry of Public Administration and Ministry of Health, to streamline the documentation management in government institutions including hospitals. Further, improvement of the existing documentation management system can be achieved by improving the factors such as knowledge, attitudes and practices. Therefore, assessment of the existing system, identification of gaps and weaknesses, introduction of interventions that overcome the identified gaps, and post-evaluation would be helpful to the improvement of current document management system of the wards and units.

### **Objective**

To improve the documents management among in-charge nursing officers of selected wards of the National Hospital of Sri Lanka.

### **Methodology**

This study was conducted from December 2016 to July 2017. Engagement of all relevant stake holders and avoiding the disturbances to treatment procedures were selected as the guiding principles. Eighty-one (81) Ward-in-charge nursing officers of the National Hospital of Sri Lanka (NHSL) formed the study population. After sample size calculation, 66 in charge NOs were randomly selected for this study.

This study consisted of three phases.

#### **Phase one**

Both quantitative and qualitative techniques were used for this stage. Questionnaires were used to assess the knowledge and attitude on document management while a check list was used to assess the practices. After an extensive literature review including Questionnaires in nursing administration and general management text books<sup>3,4</sup>, the questionnaire was adapted to suit the current context. A check list was adapted from Healthcare Quality and Safety Guidelines<sup>5</sup> and international literature on document management<sup>6,7</sup>. Content validity of the study instruments was assessed by using Content Validity Index (CVI). CVI for two questionnaires and check list were 0.76, 0.83 and 0.70, respectively. Test-retest method was used to assess reliability of the study instruments. Pretesting of questionnaires and checklists were carried out at the Teaching Hospital, Peradeniya. Unambiguous wording and logical sequence of the questions were assessed, and relevant corrections were carried out accordingly.

Written consent was obtained before data collection. Pre-interventional data on knowledge and attitude were collected at the introductory session of the project and practices were assessed at each ward level. A Focus Group Discussion (FGD) was conducted with 8 ward-in-charge Nursing Officers. Microsoft Excel 2010 and SPSS version 17 were used for the quantitative data analysis. Thematic coding and word out software for qualitative data analysis was used for the analysis of FGD.

#### **Phase two**

Level of knowledge, attitude and practices and gaps that were revealed during the pre-assessment stage were considered for planning the interventions. Further, discussions were held with many stake holders. It was decided to formulate an interventional programme containing training sessions, introduction of a guideline and an administrative intervention.

The Principal Investigator (PI) and an expert in adult education were involved in the formulation of the basic training module. The concept of andragogy which involves the art and science of adult learning was selected as the main learning theory for this project<sup>8,9</sup>. Multiple learning methods such as verbal, visual techniques, case studies, problem discussions were incorporated into the training programme. Several international and local guidelines were considered to formulate a suitable guideline for document management. Final review of the drafted guideline was done by a panel.

Chief Nursing Officer (CNO) of the NHSL implemented several administrative arrangements for ward level supervision. Interventions were implemented through the Quality Management Unit of NHSL for a period of three months.

#### **Phase three**

Post-interventional knowledge, attitude and practices were assessed during this phase. Paired t- test was used to test the significance of results.

---

## Results

From the study population (n=66), fifty-two (52) in-charge nursing officers participated in the study. Therefore, the response rate was 78%.

**Table 1: Mean score of knowledge on document management according to the interventional levels.**

Interventional level	Mean score on knowledge
Pre-interventional	68
Post-interventional	81

Df= 51    t(51) = 2.05    p= 0.01

Mean score for knowledge on document management was increased from 68 to 81 which was statistically significant.

**Table 2: Mean score of attitudes on document management according to the interventional levels.**

Interventional level	Mean score on attitude
Pre-interventional	61
Post-interventional	68

Df= 51    t(51) = 2.33    p= 0.03

Mean score for attitude on document management was increased from 61 to 68 which was statistically significant.

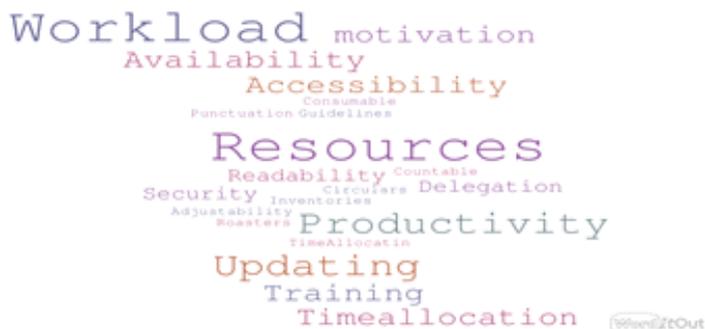
**Table 3: Mean scores of selected variables in document management according to the interventional levels.**

Variable	Pre-interventional	Post-interventional	Df	P value
Availability	90	92	51	0.017
Accessibility	56	62	51	0.000
Level of updating	57	66	51	0.000
Protection	48	53	51	0,001
Readability	94	95	51	0.219

Mean scores of the selected variables were increased from pre-interventional level to post- interventional level. Further, the increases of all the variables were statistically significant except that of the Readability component.

---

## Visual representation of the results of FGD with selected in-charge Nursing Officers of the NHSL



Issues related to Workload and Resources were highlighted than other matters in the FGD.

### Discussion

A quantitative and qualitative research type was used to increase the comprehensiveness of the study.

Availability of relevant and reliable information sources has been identified as a key influential factor for the functioning of a proper health care service. The mean score on availability of selected documents was increased from 90 to 92. Since its inception, the state health sector, as a component of the Sri Lankan government service, is regulated by many measures such as the Establishment code, hospital manuals and circulars that have been released at relevant times. Therefore, adherence to such an administrative frame work could be one possible reason for this higher level of availability. Similarly, proper document management including Availability was mentioned as an essential but not an optional duty for registered nurses in Canada 10.

Accessibility of documents is defined as the ability to access the particular documents. The mean score of accessibility was increased from 56 to 62 in this study. Therefore, increasing physical accessibility to documents has been recognized as an essential prerequisite for an efficient and effective working environment 11. Conversely, some global studies on accessibility consider many associated factors such as physical access, ability to take information quickly and the familiarity with documentary sources as important components 12.

Appropriate level of protection is essential for a consistent and secured document management system. Mean score for the protection of documents was increased from 48 to 53. In support of this, preservation of needy documents has been identified as a requirement that should be fulfilled by the nursing administration and other public servants 3,13. Updating of relevant documents ensures the availability of current and reliable information. The mean score for updating was increased from 57 to 66. Similarly, updating of inventories is identified as a main determinant of the Just In Time management in health care services 14.

Outcome of the document management depends considerably on the Readability aspect. Comparatively high level of the literacy rate in the Sri Lankan population and standard selection criteria for nursing service could be possible reasons for the high level of the mean score of the Readability component.

### Conclusion

This institution based interventional study was focused to improve the document management among in-charge nursing officers of the selected wards of the NHSL. Knowledge, Attitude and Practices on document management were measured at pre- and post- interventional level. Improvements were observed in all the components. Finally, expansion of this study to wards in other hospitals and the re-evaluation of the study to determine sustainability are recommended.

---

## References;

1. National Hospital of Sri Lanka. (2015). Annual Health Bulletin.
2. Sridharan, S., Liyanage, U., Wickramasinghe, C. (2009). Impact of Individual Factors on Job Satisfaction of Nursing Officers in Sri Lankan Government Hospitals: SLJM;14(1).
3. Basawantappa, T. (2002). Nursing Administration: jaypee publications
4. Rupasinghe, A.D. (2013). Office Management: Author Publication; 24-36.
5. National Guidelines for Improvement of Quality and Safety of Healthcare Institutions (2010). Ministry of Health, Sri Lanka.
6. Okaisu, E., Florence, K., Grace, W., Minette, C. (2014). Improving the quality of nursing documentation: An action research project, Journal of the Democratic Nursing Organizations of South Africa.
7. Sachdeva, V. (2008). Good Documentation and quality management principles, World Health Organization, 8; 2-17
8. Knowles, M.S. (1984). Andragogy in action (1st ed.). San Francisco: Jossey-Bass
9. Howard, G., Hatch, T. (1989). Educational Implications of the theory of Multiple Intelligence. Educational Researcher (18) 8; 4-10.
10. Documentation Guideline for Registered Nurses (2012). College of Registered Nurses of Nova Scotia, Canada
11. Handapangoda, WS (2012). effective office management: usjp
12. Fidel, R., Green, M. (2003). The many faces of accessibility: Information processing and management, 40. 563-581.
13. World Bank.(2000). Reforming Public Institutions and Strengthening Governance, Poverty Reduction and Economic Management (PREM) Network.
14. Jinglin ,L. (2015). Just In Time management in Health care operations: western Kentucky university.

---

# KNOWLEDGE AND PERCEPTION ON MEDICAL ETHICS AND MEDICO-LEGAL DUTIES AMONG GOVERNMENT MEDICAL OFFICERS IN A DISTRICT OF SRI LANKA

*Amarasinghe PVNP<sup>1</sup>, Weerasinghe MC<sup>2</sup>*

---

## Abstract

**Introduction:** There are several issues related to medical ethics and medico-legal duties (ME & MLD) of doctors and they could be due to lack of knowledge and challenges of ethical dilemmas in rapidly changing society. These issues can be resolved with proper education and training on ME & MLD.

**Objectives:** To assess the knowledge and perception of selected aspects of ME & MLD among government medical officers in a district of Sri Lanka.

**Methodology:** A cross sectional descriptive study was conducted among 500 doctors in the government curative sector in Kalutara district. All doctors in these hospitals were considered as the study population. A self-administered questionnaire was used to collect the data.

**Results:** The results indicated that majority of them (59.7%) had training on this area and mainly as undergraduates (47.5%). The overall knowledge of ME & MLD was inadequate ((52.2%). Knowledge of the ME is lower than the MLD. The overall perception was positive (80.7%). They have identified in- service training (86.2%) and medical education (87.3%) on ME & MLD is needed for the improvement of the ethical clinical practice. The main sources of information to them were ministry of health (31.8%), and professional bodies (7.2%). The most preferred sources were the same (58.0% and 20.4%) There is an association between the total knowledge and perception. This difference is statistically significant.

**Conclusion:** Although the general knowledge was poor, perceptions were positive regarding ME & MLD. Also, knowledge regarding ME was poor than MLD. It was shown ME & MLD should be an integral part of the professional development of medical officers.

(Keywords: Medical ethics and medico-legal duties knowledge, perception)

## Introduction

Medical ethics is a branch of ethics which pertains to medical practice. It is viewed as part of bioethics. Medical ethics also includes business and financial ethics as well as general ethics (1).

There are four major principles of medical ethics namely, autonomy, beneficence, non-maleficence and justice (2). Autonomy is the patient's independence or liberty on decision making when the health care provider suggests treatment. Beneficence means medical practitioner must help and act in the best interest of their patients. Non-maleficence is doing no harm to patients. Justice is the principle related to ethics, law, and public policy.

Hippocratic Oath is the oldest document of medical ethics. It contained all main principles of medical ethics except autonomy. Following first and second world wars and experiences of gross violations of medical ethics, declarations of Geneva and Helsinki were introduced as the codes for medical practice and medical research. Mainly, declaration of Geneva describes the health of the patient as the prime concern of the physician (3).

Ethics has been described as starting point when the legal mandate ends. Law is defined as the established and enforceable social rules for conduct or non-conduct (4). Medical law application is mainly confined to forensic practice in the curative care.

## Objectives

Objective of this study was to assess the knowledge and perception of selected aspects of medical ethics and medico-legal duties among medical officers in a district of Sri Lanka.

## Methodology

This study employed a cross sectional design. The study population consisted of all the medical officers who are working in government hospitals, Kalutara district in Sri Lanka. All the medical officers who are

---

<sup>1</sup>Registrar, Medical Administration

<sup>2</sup>Senior Lecturer, Faculty of Medicine, University of Colombo

---

working were considered as the study population.

There is 1 district general hospital (DGH) 3 base Hospitals (BH) as the main service provider. There were 6 district hospitals (DH), 3 peripheral units (PU), 9 rural hospitals (RH), 3 central dispensaries (CD) as the curative care institutions and 11 medical officer of health (MOH) offices as the preventive care institutions. Total medical officers in the district were 562. The total medical officers in the curative sector were 500 and preventive sector were 62.

Consultant medical officers, Registered and Assistant medical officers, Directors and Medical superintendents, House officers, Medical officers who have worked less than three months in the study area, those on leave or absent were excluded from the study. After getting the permission from the relevant institutions, the study was conducted among the medical officers who fulfilled the inclusion and exclusion criteria.

The self-administered questionnaires consisted of Socio-demographic data, knowledge regarding the medical ethics and medico-legal duties, perception regarding the medical ethics and medico-legal duties and sources of medical ethics and medico-legal duties information for medical officers. Scores were given for poor, fair and good categories according to correct-1, incorrect-0 and don't know as 0. Questions were also included regarding the respondent's sources of medical ethics and medico-legal duties information and the preferred sources out of them. Most of the questions were close ended. Few questions were open ended. The questionnaire was prepared in English. Pre-test was done among the medical officers in a similar setting, in an adjacent district.

Data collection was done by the principle investigator with the assistance of two medical officers. The assistants were trained by the principle investigator with necessary guidelines and role plays. The questionnaire was administered to 3 adjacent hospitals per day. All the medical officers selected in a hospital were asked to come to a separate room/hall as one group when administering the questionnaire. The data collection was done in a division within a week to minimize the contamination. Informed written consent was obtained from the respondents before administering the questionnaire. Ethics approval for the study was obtained from Ethic Committee Faculty of Medicine, University of Colombo. This study was conducted in July and August of 2014

## Results

Of the total study population (500), 362 responded. The non-respondents' rate was 21%. The vast majority of respondents who participated for the study were Sinhalese (96.4%) and Buddhists (94.5%). According to the table 1, 188 of the participants (51.9%) were females. The highest proportion (55%) of the participants; numbering 199 were in 31-40-year age category. The lowest percentage 7.3% belonged to 51-60 age categories.

As shown in the table 2, most of the participants, 189 (52.2%), has had a poor level of knowledge regarding medical ethics and medico-legal duties and 159 of them (43.9%) has had a fair level of knowledge. Only 14 of 362 have had a good level of knowledge (3.9%).

---

**Table 1**  
**1. Distribution of the study participants by sex, age, religion and ethnicity (n=362)**

<b>Variable</b>	<b>Number</b>	<b>Percentage</b>
<b>Sex</b>		
Male	174	48.1
Female	188	51.9
<b>Age category</b>		
20-30	54	14.9
31-40	199	55.0
41-50	95	26.2
51-60	14	3.9
<b>Religion</b>		
Buddhism	342	94.5
Catholic	8	2.2
Other Christians	1	0.3
Hindu	3	0.8
Islam	8	2.2
<b>Ethnicity</b>		
Sinhalese	349	96.4
Tamil	4	1.1
moor	9	2.5

**Table 2**  
**Distribution of the study participants according to the total level of knowledge scores**

<b>Level of knowledge</b>	<b>Number</b>	<b>Percentage</b>
Poor	189	52.2
Fair	159	43.9
Good	14	3.9
Total	362	100

---

**Table 3**  
**Distribution of the study participants according to the total level of perception scores**

<b>Level of perception</b>	<b>Number</b>	<b>Percentage</b>
Positive	292	80.7
Negative	70	19.3
Total	362	100

According to the total perception scores shown in table 3, 292 (80.7%) of the study participants has had a positive perception on ME&MLD. As indicated in the Table 4, most of the participants (n= 177, 48.9%) have used the combined sources for information The health ministry circulars, guidelines, in-service training has become the main source among the study participants (31.8%).

The table 5 shows most of them who has had a good knowledge also had a positive perception. Those who have had a poor knowledge also had a negative perception. The difference between the two groups was statistically significant ( $p<0.05$ ).

**Table 4**  
**Distribution of the study participants according to the source information on medical ethics and medico-legal duties**

<b>Sources</b>	<b>Frequency</b>	<b>Percentage</b>
Ministry(Circulars, Guidelines In-service training)	115	31.8
Professional bodies (SLMA,SLMC)	26	7.2
Trade unions	6	1.7
Media(printed, electronic)	17	4.7
Others	21	5.7
Combined sources	177	48.9
Total	362	100.0

**Table 5**  
**Distribution of respondents by knowledge according to perception on medical ethics and medico legal duties**

knowledge	perception		Total
	Positive	Negative	
Poor	142 (74.7%)	48 (25.3%)	190 (100%)
Fair	139 (87.4%)	20 (12.6%)	159 (100%)
Good	11 (84.6%)	2 (15.4%)	13 (100%)
Total	292	70	362
$\chi^2=7.137$	p= 0.008		df=1

## Discussion

The main objective of this study was to explore the knowledge and perception of ME&MLD among medical officers in a district of Sri Lanka. Most of the medical officers represent the 31-40-year age category. As it has been observed in most of the studies among doctors worldwide (5), a high non-response rate (21%) is seen in this study too.

The overall knowledge of the ME&MLD is poor (52.2%) for a majority of participants. These findings are comparable with an earlier study done in Sri Lanka (6), Barbados (7) and Pakistan (8). It is also revealed that ME knowledge is poorer than the knowledge of MLD. A study among Indian doctors found relatively higher knowledge of MLD (9). Overall perception is positive for selected scenarios and situations given in the study (80.7%). A large proportion of them are trained (59.7%) but only at undergraduate level. (47.5%). It has shown that in a study among GPs in Lithuania, 49.3% respondents proved to be knowledgeable about legal standards protecting the confidentiality of adolescents in healthcare (10).

Most Medical officers showed a positive perception of ME. Although our study showed majority disagree on euthanasia, in a study done in India contradictory findings were observed (11). There is a statistically significant association with total knowledge and total perception. Our findings are also comparable with a study done in Kandy (6). In India, interns and post-graduate students (89%) have felt a need for a separate session on medical ethics (5).

Unethical medical practices have increased in certain countries such as feticide in India and criminal abortions in Sri Lanka (12). Therefore, unprecedented ethical dilemmas may arise in near future. Hence, the Sri Lankan medical officers' knowledge and ethical practice should be up-dated through continuous professional development.

## Conclusion and Recommendations

This study revealed that a poor knowledge but positive perceptions on ME&MLD among Sri Lankan medical officers. This finding needs urgent attention of medical regulating body and medical educationalist to institute continuous professional development programmes among medical officers to provide a better service to the patients.

---

## Acknowledgement

The authors acknowledge the PDHS western province, RDHS Kalutara, director, DGH Kalutara, MS of BH Panadura, Horana, Pimbura, all DMO/MOIC of divisional hospitals of Kalutara district and all the doctors for their helping and participation.

## References

1. Mary, M., Wallace, O., 2013. Wisegeek Conjecture cooperation Available at H:/What Are Medical Ethics. htm
2. Jane R., Linda. J.L., 2011, Medical ethics for dummies, Publishing, Inc., Indianapolis, Indiana
3. MacDougall, H., Ross, G., Angley, L., 2014. Medical ethics past, present and future Royal College of physicians and surgeons Canada
4. Lisa, V., Brock, J. Anna, M. 2013. Ethics in medicine. University of Washington School of medicine.
5. Selvaraj, K., Sivaprakasam, P., Sudhir, B.T., Nelson, B., Kuma, R. G.H.M., 2013. Perception of interns and postgraduates towards Medical Ethics Education,

*International journal of current microbiology and applied sciences*, Vol 2(9) p 198-203. Available from: <http://www.ijcmas.com/vol-2-9/Kokila%20Selvaraj,%20et%20al.pdf>

6. Ranasinghe, A.W.I.P., 2009. Knowledge, attitudes and practices of medical ethics among medical officers in teaching hospitals in Kandy district. Dissertation (MSc Community Medicine). Postgraduate institute of medicine, Colombo.
7. Hariharan, S., Jonnalagadda, R., Walrond, E., Moseley, H., 2006. Knowledge, attitudes and practice of healthcare ethics and law among doctors and nurses in Barbados, *BMC Medical Ethics*, 7(7) Available at <http://www.biomedcentral.com/1472-6939/7/7>
8. Shirazi, M.B., Shasha, M.S., Shamim, S., Ahmed, A., 2005. Medical ethics in surgical wards: knowledge, attitudes and practice of surgical team members in Karachi, *Indian Journal of medical ethics*. Vol2 (3) . Available at : <http://www.ijme.in/index.php/ijme/article/view/745/1793>
9. Santhosh, C.S., Nawaz, B., 2013. Perception of ethics & Consumer Protection Act among doctors. *Journal of Punjab Academy of Forensic Medicine Toxicology*, 13(1), 25-7 Available at : <http://medind.nic.in/jbc/t13/i1/jbct13i1p25.pdf>

Available at : <http://www.tandfonline.com/doi/full/10.1080/135485>

00601043467#.VCkePVeGrIU

10. Jeffrey, V. L., Jaruseviciene, L., Liljestrand, J., 2011. Confidentiality and parental involvement in adolescent sexual and reproductive health care: A cross-sectional study of Lithuanian general practitioners *Scand J Public Health*, 39,484-491
11. Kamath, S., Bhate, P., Mathew, G. Sashidharan, S. and Daniel, A.B., 2011. Attitudes toward Euthanasia among Doctors in a Tertiary Care Hospital in South India: A Cross Sectional study *Indian Journal of Palliative Care*, 17(3) P. 197-201. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3276816/>
12. Kasturiarachchi, N., Lie, R. and Seeberg, J. 1999. Health ethics in south East Asia, New Delhi, WHO

---

# EVALUATION OF THE EFFECTIVENESS OF A MANAGERIAL INTERVENTION TO STRENGTHEN THE HEALTHY ORGANIZATIONAL CULTURE IN THE NATIONAL HOSPITAL OF SRI LANKA

*Dahanayake LACS<sup>1</sup>, Jasinghe A<sup>2</sup>, Opatha HHDNP<sup>3</sup>*

---

## Abstract

**Introduction:** Healthy Organizational Culture (HOC) of a health care facility is a reflection of the patient safety level. The major health care facilities in Sri Lanka are very complex organizations with massive health care workforces. Therefore, strengthening the HOC is a challenge to leaders of major hospitals of Sri Lanka.

**Objective:** To evaluate the effectiveness of an intervention for strengthening the HOC of National Hospital of Sri Lanka.

**Methodology:** The newly designed Eight - Point Conflict Management Interventional program was implemented at the level of nursing leaders of NHSL and the effectiveness was tested through pre- and post surveys among simply randomized control and experimental groups.

**Results:** There is a significant increase in the perceived level of Healthy Organizational Culture among Nursing Leaders in the experimental group following the intervention.

**Conclusion:** The newly designed *Eight-Point Conflict Management Program* is successful in strengthening the healthy organizational culture of the NHSL and its application can be recommended in major health care facilities following feasibility studies.

*(Key words:* Healthy Organizational Culture, McGregor's Theory X and Theory Y, the Consideration and Initiation Spectrum, the Leader-subordinate relationship, Assertiveness, transactional analysis, negotiation skills)

## Introduction

Hospitals are high-risk organizations as they deal with life and death of human beings around the clock. The purpose of existence of a hospital is to cure patients with its optimal capacity while ensuring patient safety. Therefore, healthy organizational culture is a major prerequisite to ensure patient safety processes in a hospital setup. A healthy organizational culture treats employees of the organization as the most important resource or at least one of most important resources and attempts to enhance employees' wellbeing. A motivated, happy, productive health care worker is a key determinant of error free, confident, efficient patient care services. Therefore, it is evident base reporting that patient safety culture can easily be built upon by well-developed, sustainable healthy organizational culture.<sup>1</sup>

There are three major dimensions of healthy organizational culture that are direct phenomena of the leaders' role; the level of leaders' attitude orientation about subordinates (Douglas McGregor's Theory X and Theory Y), the degree of leaders' consideration and initiating spectrum and leader - subordinate relationship. Leaders are supposed to have appropriate attitudes about subordinates, to exhibit optimal level of both consideration and initiation behaviors, and to maintain a strong superior-subordinate relationship to build a healthy organizational culture in his entity.<sup>2,3,4,5</sup>

In general, there are two major mechanisms that leaders can use to embed a culture; primary embedding mechanism and secondary embedding mechanism. Above all, leaders' reactions to conflicts (critical incidents and organizational crisis) that are leaders' conflict management competencies, is a major primary embedding mechanism. Therefore, leaders' conflict management competencies act as a mediating variable, which determines the state or degree of healthy organizational culture of an organization or unit.<sup>8</sup>

---

<sup>1</sup>Senior registrar in Medical Administration, Postgraduate Institute of Medicine, University of Colombo

<sup>2</sup>Director General of Health Services, Ministry of Health, Nutrition & Indigenous Medicine of Sri Lanka

<sup>3</sup>Senior Professor, Department of Human Recourse Management, Faculty of Management Sciences, University of Sri Jayewardenepura

## Objective

To study the effectiveness of newly designed conflict management interventional program for enhancing the healthy organizational culture of nursing heads in National Hospital of Sri Lanka.

## Design

As far as this interventional study is concerned, a conflict management program plays a significant role in creating right competencies within the unit of analysis that is the individual nursing head. If leaders have right competencies of conflict management, it is argued that they understand that dysfunctional conflicts need to be avoided; subordinates need to be valued; getting things done with subordinates and through subordinates in collaborative way is indispensable; and engages in actions that will avoid or minimize the occurrence of dysfunctional conflicts. Thus, the conflict management program, which is expected to be developed under this study, is considered as the independent variable while healthy organizational culture is considered as the dependent variable.

The study area selected for this research project is National Hospital of Sri Lanka (NHSL). NHSL is the biggest tertiary care center in Sri Lanka, as well as in South East-Asia. The study population in this research project is nursing heads. As the study was conducted by using control and experimental groups, the NHSL where there is a significant number of homogenous group of nursing heads was selected.

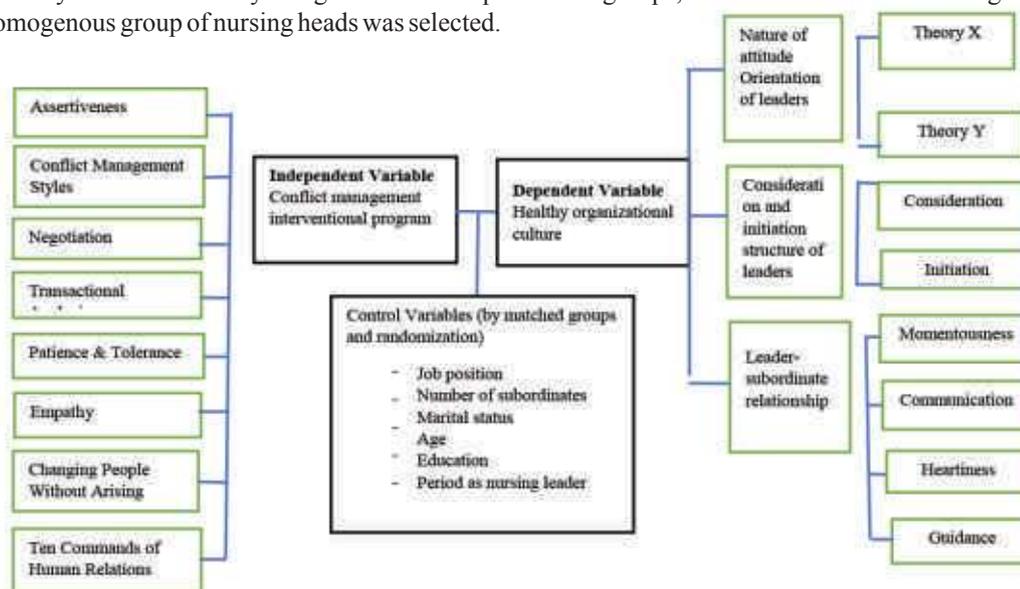


Figure 4- Schematic representation of cause effect relationship between dependent and independent variables of research project

## Methodology

This interventional study consisted of four main stages.

During Stage 1, the working definition of HOC was formulated and the HOC Description Questionnaire consisting of 30 variables was developed. The perceived level of HOC of nursing heads was assessed as the pre-interventional survey using this study instrument.

During stage 2, the key leadership competencies in relation to conflict management and three dimensions of HOC were identified. The gaps of these competencies were measured using eight-point competency index test and the intervention was designed to fill the identified gaps of so called competencies. The methods used to design the best possible intervention following literature review were, Delphi technique among subject experts, key informative interviews with Chief Nursing Officer and Nursing Sisters, Focus Group Discussions among unit leaders and opinion of experts. Then the Manual on Eight Point Conflict Management Program for Nursing leaders was written and the implementation plan consisting of preparing action plans, arranging logistics, preparing workshop agenda and budgeting workshops was finalized.

During Stage 3, the control and experimental groups were separated by simple randomization. Only the control group was exposed to a series of newly designed Leadership Skill Building Workshops based on the newly written manual. Total number of working hours was 22.

**Table 02- brief illustration of key elements of newly designed Eight- Point Conflict Management Program for Strengthening Healthy Organizational Culture of Major Health Care Facilities**

<b>Point</b>	<b>Principle / competency</b>	<b>Applications/ Skill Builders/ Tools/ Techniques</b>
Point 01	Assertiveness	<ul style="list-style-type: none"> <li>☞ Assertiveness Inventory</li> <li>☞ DESI Model</li> <li>☞ Assertiveness game</li> <li>☞ Pictorial analysis</li> </ul>
Point 02	Five Styles of Conflict Management	<ul style="list-style-type: none"> <li>☞ Conflict Management Style Index</li> <li>☞ Techniques to apply conflict management styles in working place</li> <li>☞ Role play on understanding link between assertiveness, cooperation and effective conflict management techniques</li> </ul>
Point 03	Negotiation Skills	<ul style="list-style-type: none"> <li>☞ Steps to achieve integrated negotiation</li> <li>☞ Strategies to negotiate with labor unions</li> <li>☞ Negotiate with peer leaders in implementing new projects</li> <li>☞ Negotiate with subordinates in grievance settlements</li> <li>☞ Role play on ethics in negotiation</li> <li>☞ Classic story</li> </ul>
Point 04	Transactional Analysis	<ul style="list-style-type: none"> <li>☞ Exploring own ego status</li> <li>☞ Apply change model to embed the Adult ego status</li> <li>☞ Role play- Life Positions</li> <li>☞ Demonstration – complementary transaction, crossed transaction, ulterior transaction</li> <li>☞ Pictorial display – Relationship between life positions, ego status and conflict management style</li> <li>☞ Sharing latest work place conflict and replay with application of transactional theory</li> </ul>
Point 05	Patience & Tolerance	<ul style="list-style-type: none"> <li>☞ Explore the Patience and Tolerance Index</li> <li>☞ Role Play – “There is no limit for patience”</li> <li>☞ A classic story about patience</li> </ul>
Point 06	Empathy	<ul style="list-style-type: none"> <li>☞ Traits of an empathetic leader</li> <li>☞ Emotional Intelligence</li> <li>☞ Self-evaluating tool for empathy</li> <li>☞ Critical Incident</li> </ul>

During stage 4 the post interventional surveys on HOC Description Questionnaire and competency index were carried out for both experimental and control groups.

## Results

**Table 1: Frequency Distribution of perceived level of healthy organizational culture and its dimensions before and after the newly designed Eight Point Conflict Management Interventional Program by experimental group and control group of Nursing leaders in NHSL**

Study Group	Perceived Level of strength of the parameter	Dimensions of Healthy Organizational culture						Perceived level of Healthy Organizational Culture	
		Leader's attitude orientation toward theory Y		Leaders behavior between Consideration and Initiation Spectrum		Degree of Leader-Subordinate Relationship			
		No.	%	No.	%	No.	%	No.	%
<i>Before Intervention</i>									
Experimental Group	Poor	20	43.48%	18	39.14%	19	41.30%	22	47.8%
	Low	15	32.62%	17	36.96%	11	23.91%	12	26.1%
	Satisfactory	09	19.56%	09	19.56%	14	30.43%	10	21.7%
	Good	02	4.34%	01	2.17%	01	2.17%	01	2.2%
	Strong	00	0.00%	01	2.17%	01	2.17%	01	2.2%
	<b>Total</b>	<b>46</b>	<b>100.00</b>	<b>46</b>	<b>100.00</b>	<b>46</b>	<b>100.00</b>	<b>46</b>	<b>100.0</b>
Control Group	Poor	19	41.30%	17	36.96%	21	45.65%	21	45.6%
	Low	16	34.78%	18	39.14%	09	19.56%	11	23.9%
	Satisfactory	10	21.70%	08	17.39%	14	30.43%	11	23.9%
	Good	01	2.17%	02	4.34%	01	2.17%	02	4.4%
	Strong	00	0.00%	01	2.17%	01	2.17%	01	2.2%
	<b>Total</b>	<b>46</b>	<b>100.00</b>	<b>46</b>	<b>100.00</b>	<b>46</b>	<b>100.00</b>	<b>46</b>	<b>100.0</b>

**Table 1 Continue**

Study Group	Perceived Level of strength of the parameter	Dimensions of Healthy Organizational culture						Perceived level of Healthy Organizational Culture	
		Leader's attitude orientation toward theory Y		Leaders behavior between Consideration and Initiation Spectrum		Degree of Leader-Subordinate Relationship			
		No.	%	No.	%	No.	%	No.	%
<i>After Intervention</i>									
Experimental Group	Poor	03	6.52%	02	4.34%	01	2.17%	02	4.4%
	Low	03	6.52%	04	8.69%	01	2.17%	02	4.4%
	Satisfactory	10	39.14%	09	19.56%	10	21.70%	10	21.7%
	Good	18	39.13%	18	39.13%	22	47.82%	20	43.5%
	Strong	12	26.09%	13	28.26%	12	26.09%	12	26.1%
	<b>Total</b>	<b>46</b>	<b>100.00</b>	<b>46</b>	<b>100.00</b>	<b>46</b>	<b>100.00</b>	<b>46</b>	<b>100.0</b>
Control Group	Poor	20	43.47%	18	39.13%	21	45.65%	19	41.3%
	Low	12	26.09%	14	30.43%	11	23.91%	13	28.2%
	Satisfactory	08	17.39%	10	21.74%	09	19.56%	09	19.6%
	Good	05	10.87%	03	6.52%	03	6.52%	04	8.7%
	Strong	01	2.17%	01	2.17%	02	4.34%	01	2.2%
	<b>Total</b>	<b>46</b>	<b>100.00</b>	<b>46</b>	<b>100.00</b>	<b>46</b>	<b>100.00</b>	<b>46</b>	<b>100.0</b>

---

Quantitative measures of pre- and post- interventional surveys clearly exhibit there is a significant improvement of percentages of the higher levels of HOC, such as good and strong in experimental group after the intervention. But the levels of control group are more toward poor or low even after the period of study.

### Discussion and Conclusion

The healthy organizational culture is the best suitable culture for organizations, where leaders are managing professional workgroups. HOC values human resource as a happy, motivated employee is the most important asset of the organization.

Assertiveness, Five Styles of conflict management Negotiation skills, Transactional analysis, Patience and Tolerance, Empathy, changing people without raising resentment and Ten commandments of human relations are the newly identified best possible competencies to develop the three main dimensions of leadership qualities of HOC. The results showed that all these carefully selected competencies have shown positive relationship with the main three dimensions of HOC.9,10,11

The methodology followed in designing and implementing the intervention for leaders can be applied to any organization to develop a primary embedding mechanism to build up the desired type of organizational culture most relevant to each context.

### References

1. WHO, 2009. In: *Human Factors in Patient Safety*. s.l.:s.n.
2. Opatha, H., 2015. Organizational Culture. In: *Organizational Behaviour The Human Side Of Work*. Colombo: s.n., pp. 549,550.
3. McGregor, D., 1957. Theory X and Theory Y ;The Human Side of Management . In: *Human side of enterprise* . New Dilli: s.n.
4. Sharma, S., 2010. *Examining the Relationship between Organizational Culture and Leadership Skills*. [Online] Available at: <http://medin> [Accessed 3 12 2016].
5. Murray, 2009. *Module 4; Assertiveness Skill for the virtual workshop series and self study program- training module*. [Online] Available at: <http://www.EmotionalIntelligentLeadership.com> [Accessed 22 01 2017].
6. Boundless, 2016. *Leadership Model: The Ohio State University*. [Online] Available at:

<http://www.boundless.com>

7. Gentry, W., 2015. *Empathy in the Workplace; A tool for effective leadership*. [Online] Available at: <http://www.ccl.org/wp-content/uploads/2015>[Accessed 22 01 2016]
8. Amernet, 2010. *Creating a Culture of quality and patient safety - Intalere*. [Online] Available at: <http://www.intalere.com>[Accessed 05 02 2017].
9. Eich, K., 2016. *Why Patience is a virtue in Leaders*. [Online] Available at: <http://www.industryweek.com/leadership> [Accessed 20 10 2016].
10. Tsai, Y., 2011. *Relationship between Organizational Culture, Leadership Behaviours and Job Satisfaction*. [Online] Available at: <https://www.ncbi.nlm.nih.gov/NCBI> [Accessed 22 05 2016].
11. Ghorbani, M. & Razavi, N., 2011. The Study of the Relationship Between Organizational Culture and Conflict Management. *Middle East Journal of Scientific Research* , 10(6), pp. 711-714

---

## MANAGERIAL ASPECTS AND QUALITY PERCEPTIONS OF OUTSOURCED JANITORIAL SERVICES OF DISTRICT GENERAL HOSPITALS OF GAMPAHA DISTRICT

*Attanayake AMH<sup>1</sup>, Wickramasinghe SC<sup>2</sup>*

---

### **Abstract**

**Introduction:** Cleaning precedes disinfection and sterilization. It plays a lead role in hospital infection control. Presently, cleaning (i.e. janitorial service) has been outsourced in most hospitals. It is a global trend.<sup>1</sup>

**Objectives:** The objective of this study was to describe the managerial aspects and quality perceptions of outsourced janitorial services of District General Hospitals of Gampaha District.

**Methods:** A descriptive cross-sectional study was carried out at two District General Hospitals (DGH) of Gampaha District; DGH Gampaha and DGH Negombo.

There were three study components.

In component one, perceived quality and functional quality of outsourced janitorial service were studied using pre-tested and validated questionnaires.

In component two, manpower deployment was studied using a check list.

In component three, arrangements for the monitoring of disinfections were studied through Key Informant Interviews (KII).

**Results and discussion:** The service suppliers have failed to provide the agreed male to female composition in manpower deployment.

Disinfectants escape monitoring neither being verified for quality nor quantity.

Majority of the ward sisters claimed that the performance of the janitorial service is poor in cleaning both ward premises (87.5%) and patient washrooms (82.1%). Majority of the ward sisters (65.4%) claimed that the practice regarding cleaning a blood spill is also poor.

Nevertheless, majority of the patients (57%) were satisfied on the cleanliness of washrooms which was statistically significant. (P<0.05)

**Conclusion and recommendations:** The study concluded that the deployed manpower is inconsistent with the service agreement and the arrangements for monitoring of the use of disinfectants are defective. Perceived quality of the outsourced janitorial services is consistent with the expectations of patients. However, the functional quality is inconsistent with the expectations of the ward sisters and nursing officers in charge.

It is recommended to provide regular in-service training sessions for janitors and to take an action to deploy them as depicted in the service agreement. It is also recommended to maintain a balance book for disinfectants to scale up monitoring.

*(Key words: janitorial service, outsource, perceived quality, functional quality, manpower)*

---

<sup>1</sup>Postgraduate trainee in medical administration

<sup>2</sup>Deputy Director General (NCD), Ministry of Healthcare and Nutrition

---

## Introduction

Janitorial service is a hospital utility service. It involves cleaning and maintenance of hospital premises. Cleaning is the physical removal of dirt in order to remove many micro-organisms. It precedes disinfection and sterilization. Cleaning process is difficult to quantify and can be assessed by visual appearance.<sup>2</sup>

Hospital janitorial service was delivered by a category known as “Sanitary Labourers (later designated as “Health Work Assistants”) for more than 100 years in Sri Lanka.<sup>8</sup> In 1997, a policy decision was made to outsource hospital janitorial services, aligning with both global and local trends in the health market.<sup>6</sup> As of today, hundred percent (100%) of the District General Hospitals<sup>5</sup> under the line Ministry have outsourced its cleaning services along with more than eighty percent(88.9%) of its counter partners under the nine Provincial Councils.

Even though twenty years have elapsed following outsourcing, only limited literature is still available on this thematic arena, where there was hardly any review on the policy decision made to outsource hospital janitorial services in Sri Lanka.

Invariably outsourcing plays a key role in organizational restructuring and downsizing. It may reduce cost, improve productivity and enhance competitive advantage.<sup>7</sup> It was claimed in an interview that it is not clear whether it is reasonable to outsource a technically sound entity such as hospital janitorial service.<sup>3</sup> Nevertheless such an outsourcing decision can be justified if proper service agreements, pre-employment training and supervision are in place.

On such a backdrop this study sets in to explore the strengths and weaknesses of the outsourced hospital janitorial services by analysing its managerial aspects and quality perceptions in a view of improving its efficiency, effectiveness and responsiveness.

## Objectives

### General Objective

To describe managerial aspects and quality perceptions of outsourced janitorial services of District General Hospitals (DGHs) of Gampaha district

### Specific Objectives

1. To assess the manpower deployment as per respective service agreement in DGHs of Gampaha district.
2. To describe the arrangements for monitoring of disinfectants of outsourced janitorial services in DGHs

of Gampaha district.

3. To describe the functional quality of janitorial services in DGHs of Gampaha District as perceived by its ward sisters and nursing officers in charge

4. To describe the perceived quality of janitorial services DGHs of Gampaha district as perceived by patients

## Methodology

A descriptive cross-sectional study was carried out at two District General Hospitals (DGH) of Gampaha District; DGH, Gampaha and DGH Negombo in which the janitorial service has been outsourced.

There were three study components.

In component one, the perceived quality and functional quality of outsourced janitorial service were studied. The perceived quality of janitorial services was described by studying the quality perceptions of patients who got admitted to the medical wards of the hospital during the study period (01.01.2016-01.06.2016). Proportionate stratified random sampling method was used to identify a sample of 384 patients. A pretested and validated interviewer administered questionnaire was used to collect data. Principal Investigator (PI) and a trained pre intern medical officer collected data from respondents.

The functional quality was described by studying the quality perceptions of the sisters and nursing officers in charge of the two hospitals. A pretested and validated self-administered questionnaire was used to collect data.

Data was entered using Epi-info 7 and analysed through SPSS statistics 21 software.

In component two, manpower deployment of the outsourced janitorial services was studied. Data was collected using a check list which inquired the deployed numbers of both employees (janitors) and company supervisors during a period of one month. Data was extracted from hospital records (Retrospective study). It was intended to compare these findings with the respective service agreements as to examine whether the manpower deployment is consistent with the service agreement. In DGH Gampaha such retrospectively collected data was compared with the empirical findings of a separate prospective study. In this study, data was collected by PI through a head count. This prospective study was not carried out in DGH Negombo as the contractor was changed during the study period. Data was entered in MS office Excel package and analysed by SPSS statistics 21 software.

In component three, the arrangements for monitoring of disinfectants were studied through Key Informant Interviews using a semi structured interviewer schedule. Data was entered manually by PI.

### Results

Table 1 shows the manpower deployment of janitorial services of the District General Hospital of Gampaha, comparing with the deployable number of manpower against the actual deployment in the month of March 2016 (Retrospective study).

**Table 1: Manpower Deployment of Janitorial Services of the DGH Gampaha- March 2016**

	Manpower Deployment			
	Deployable number as in agreement	Actually deployed number		
		Mean	Range	SD
Day shift male employees	10	9.94	9-10	0.25
Day shift female employees	32	31.39	24-32	1.91
Total number of employees (day shift)	42	41.32	33-42	2.01
Night shift male employees	4	2	-	0.0
Night shift female employees	7	9	-	0.0
Total number of employees (night shift)	11	11	-	0.0
Total number of supervisors (Day shift)	2	2	-	0.0
Total number of supervisors (Night shift)	1	1	-	0.0

According to table 1 the deployable numbers in the service agreement and actually deployed number in day duty shifts are almost same, as opposed to night shifts, where more female employees have been deployed to compensate for the deficient male employees.

Similar results were observed in the respective study done for DGH Negombo.

Table 2 shows the manpower deployment of janitorial services of the DGH Gampaha comparing the deployable number of manpower against the actual deployment in the month of May 2016 prospectively.

**Table 2: Manpower Deployment of Janitorial Services of the DGH Gampaha for the Month of May 2016 (Prospective Study)**

	Manpower Deployment			
	Deployable number as in agreement	Actually deployed number		
		Mean	Range	SD
Day shift male employees	11	9.11	5-11	1.764
Day shift female employees	35	26.89	19-32	3.790
Total number of employees (Day shift)	46	36.89	29-42	4.000
Night shift male employees	3	2.78	2-3	0.441
Night shift female employees	10	10.0	-	0.00
Total number of employees(night shift)	13	12.78	12-13	0.441
Total number of supervisors (Day shift)	2	1.67	1-2	0.500
Total number of supervisors (Night shift)	1	1.00	-	0.000

According to table 2, the actually deployed numbers are not in agreement with the deployable number in the day shift. A statistical comparison of the above prospective findings with the corresponding retrospective results of manpower deployment in DGH Gampaha is difficult owing to the fact, that service agreement was renewed as the prospective data collection commenced, even though the contractor remained same.

Key informant interviews revealed that the disinfectants are brought to the hospital by the contractor on a monthly basis in quantities consistent with the agreement. But they are not being recorded and merely kept in the custody of the company supervisors. Disinfectants should be issued in required amounts consistent with product label instructions, to reach the prescribed dilution under the supervision of the company supervisors and infection control nurse. Questionnaire survey revealed majority of ward sisters (51.8%) do not get to inspect these disinfectants before use.

Table 3 shows the performance of the janitorial service in four different locations as perceived by the Nurses and Sisters in charge of wards. (n=56)

**Table 3: Perception of the In-Charge Sisters on the Performance of the Janitorial Service**

<b>Performance of janitorial service</b>			
<b>Location</b>	<b>Good</b>	<b>Poor</b>	<b>Total (%)</b>
	<b>Number (%)</b>	<b>Number (%)</b>	
Ward premises	7(12.5)	49(87.5)	56(100)
Patients' washroom	10(17.9)	46(82.1)	56(100)
Staff rooms	6(10.7)	50(89.3)	56(100)
Staff washroom	11(19.6)	45(80.4)	56(100)

According to table 3, the majority of respondents claim that the performance is poor in all four locations.

Table 4 shows the practice of standard precautions by the janitorial staff as perceived by Nurses and Sisters in charge of wards. (n=56)

**Table 4: Practice of Standard Precautions by the Janitorial Staff**

<b>Safety measure</b>	<b>Practiced</b>	<b>Not practiced</b>	<b>Total</b>
	<b>No (%)</b>	<b>No (%)</b>	<b>No (%)</b>
Practice standard precautions when cleaning a blood spill	18 (32.14)	38(67.86)	56(100.0)
Use of personal protective equipment	3 (5.4)	53(94.6)	56(100.0)

According to table 4, majority of the respondents claim that the standard precautions are not practiced by the janitorial service when cleaning blood spill (n = 38; 67.86%) and are not using personal protective equipment (PPE), (n=53; 94.6%).

Whereas majority of end users (patients) confirmed that the wash rooms have been clean in usage and claimed (58.1%) that there was no unpleasant smell from the washroom.

Table 5 shows the user satisfaction on cleanliness of washroom, based on the overall patient experience during their stay. (n=384)

**Table 5: User Satisfaction on Cleanliness of wash room**

	Satisfaction on the cleanliness of the wash room			Total (%)
	Satisfied	Undecided	Unsatisfied	
	Number (%)	Number (%)	Number (%)	
DGH Gampaha	121(31.5)	46(12)	31(8.1)	198(51.6)
DGH Negombo	98(25.5)	52(13.8)	35(9.1)	186(48.4)
Total	219(57.0)	98(25.8)	66(17.2)	384(100)

According to table 5, 57% of respondents were satisfied with the cleanliness of the washroom. It is statistically significant. (P<0.05)

## Discussion

As evidenced by the retrospective study the contracted companies have deployed both supervisors and janitors in total numbers consistent with the service agreement in both day and night shifts, eventhough the composition of male and female employees is inconsistent with the service agreement in both hospitals. Additional female employees have been recruited to compensate for the deficient male employees especially at night. As per service agreement, surcharges from payments can be made for these deficient workers. Nevertheless, the lost work cannot be replaced.

This study also learns that the prospective findings of actually deployed manpower are inconsistent with the retrospectively collected data in DGH Gampaha. This situation deserves exploration, even though this study cannot confirm the exact reasons for such a difference.

Majority of end users (patients) confirmed that the wash rooms have been clean in usage and claimed (58.1%) that there was no unpleasant smell from the washroom. Higher number of respondents (57%) is satisfied on the cleanliness of the wash room and it is statistically significant. These findings are also in agreement with the results of the research done in Sri Lanka on the client satisfaction of the outsourced janitorial services (Sriyani and Laksiri, 2004)<sup>7</sup> which in turn confirmed that the service performance was satisfactory in outsourced janitorial services.

However, majority of sisters and nurses in charge of wards claim that the performance of the janitorial service is poor in cleaning both ward premises (87.5%) and patient washrooms (82.1%). Majority (67.9%) of the respondents claim that the practice regarding cleaning a blood spill is poor and the janitors (94.6%) are not using personal protective equipment. According to these findings the functional quality perceptions of outsourced janitorial services of

---

District General Hospitals of Gampaha district is inconsistent with the expectations of ward sisters and in charge nurses. These findings are in agreement with the results of the research done in United Kingdom (Elkomy, 2013)<sup>5</sup> which also supported the quality fading hypothesis which claimed, that outsourced janitorial services are displaying low levels of cleaning standards.

This study also implies that the quality perceptions of the patient and ward sisters are different. This may be explained by the asymmetry of knowledge between the two populations.

### Conclusions

1. The deployed manpower by the contracted companies in supply of janitorial services to District General Hospitals of Gampaha is inconsistent with the service agreement.
2. The functional quality of outsourced janitorial services of District General Hospitals of Gampaha District is inconsistent with the expectations of its ward sisters and nursing officers in charge.
3. The perceived quality of the outsourced janitorial services of District General Hospitals of the Gampaha district is consistent with the expectations of the users (patients).
4. The arrangements to monitor the use of disinfectants of DGHs of Gampaha District are defective. Disinfectants escape monitoring neither being verified for quality nor quantity.

### Recommendations

1. It is recommended that action is taken to employ workers as depicted in the contract agreement and conduct regular in-service training programs to improve the knowledge and skills of janitorial staff in a view of improving performance.
2. It is recommended to maintain a balance book for disinfectants to scale up monitoring.

### References

1. Chih-Tung, H. Jar-Yuan, P. and Hero, C. (2009) "The study on the outsourcing of Taiwan's hospitals: A questionnaire survey research". *Bio Med Central Health Services Research*, 9 (78) (Internet), Available from : <https://bmchealthservres.biomedcentral.com/articles/10.1186/1472-6963-9-78> (Accessed 15 October 2015)
2. College of Microbiologists (2005), *Hospital Infection Control Manual*. Colombo: National Library of Sri Lanka

3. Dharmasiri, A.S., 2016. Prerequisites before the decision outsourcing of janitorial service in a health care setting. Interview with Principal Investigator. 27 July. Colombo
4. Elkomy, S. (2014), Outsourcing hospital services. Available at: [https://healthcare-in-europe.com/en/story/12177-Outsourcing\\_hospital\\_services.html](https://healthcare-in-europe.com/en/story/12177-Outsourcing_hospital_services.html) (Accessed 14 September 2015)
5. Government of Sri Lanka. Bidding Notice for outsourcing Janitorial Services for hospitals and health institutions under the Line Ministry. (2014/2015) Colombo: Ministry of Health, Nutrition and Indigenous Medicine.
6. Perera, R., 2015. The history of outsourcing janitorial service in Sri Lankan health care. Interview with Principal Investigator. 6 November. Colombo
7. Sriyani, G.T.W. and Laksiri, W.M.R. (2004) "Outsourcing in Universities: A comparative analysis of in-house sourcing vs outsourcing (A case study of University of Ruhuna)". *Second Academic Sessions-2004, University of Ruhuna*, (December 2004):165-173
8. Uragoda, C.G. (1987) *A history of Medicine in Sri Lanka*. Colombo: Sri Lanka Medical Association

---

## MANAGEMENT OF DENGUE OUTBREAK AT LADY RIDGEWAY HOSPITAL FOR CHILDREN (TEACHING) COLOMBO, FROM JANUARY TO JUNE 2017: REPORT

*Wickremasinghe Wk<sup>1</sup>, Ranawaka UMNK<sup>2</sup>*

---

### Introduction

Lady Ridgeway Hospital for Children (LRH) is the premier Tertiary Care Teaching Hospital for children in Sri Lanka, situated in Colombo with 969 beds. The hospital renders its services for children less than 14 years old. The Out Patient Department (OPD) serves an average of 1500 to 2000 patients daily. About 300 patients are admitted daily to the hospital. It has been observed that the number of dengue patients had increased in the country in 2016 compared to 2015 and numbers treated at the LRH were also increased accordingly. In 2017 the total number of dengue patients has already surpassed last year's total.

### Dengue situation in the country

In recent years dengue has become a major public health concern. There were 55,102 cases reported in the country in 2016, with case fatality at a low level of 0.16. About 4753 cases of dengue fever were treated at the LRH in 2016. However, in 2017 the hospital treated 5843 cases of dengue during the first six months of the year. (LRH, 2017).

**Table 1: Distribution of dengue fever cases reported at LRH from 2013 to 30th June 2017**

	2013	2014	2015	2016	Up to 30 <sup>th</sup> June 2017
Total	3444	4176	2561	4764	5843
Dengue DF	2391	3280	1970	3564	4375
DHF	1027	879	571	1187	1696
DSS	26	17	20	09	5
Deaths	17	11	07	04	10

The usual distribution pattern of dengue in LRH from 2013 to 2016 shows a decreasing trend of disease from January to April, and the lowest incidence in May, and again shows an increasing trend in June and July. From August the disease trend declines and again from November onwards it increases until December and January. But in 2017 the incidence of dengue shows a continuous increasing trend during the first half of the year. The total number of dengue cases has increased from 2013 to 2014 and significant reduction has been observed in year 2015. Again in 2016 it has shown a spike in the total number of dengue cases. As already indicated, by mid-year 2017, the reported total number of dengue cases has already exceeded the highest number for a year in history.

---

<sup>1</sup>Director, Lady Ridgeway Hospital for Children (Teaching), Colombo 8, Sri Lanka, Specialist Medical Officer, Consultant in Medical Administration

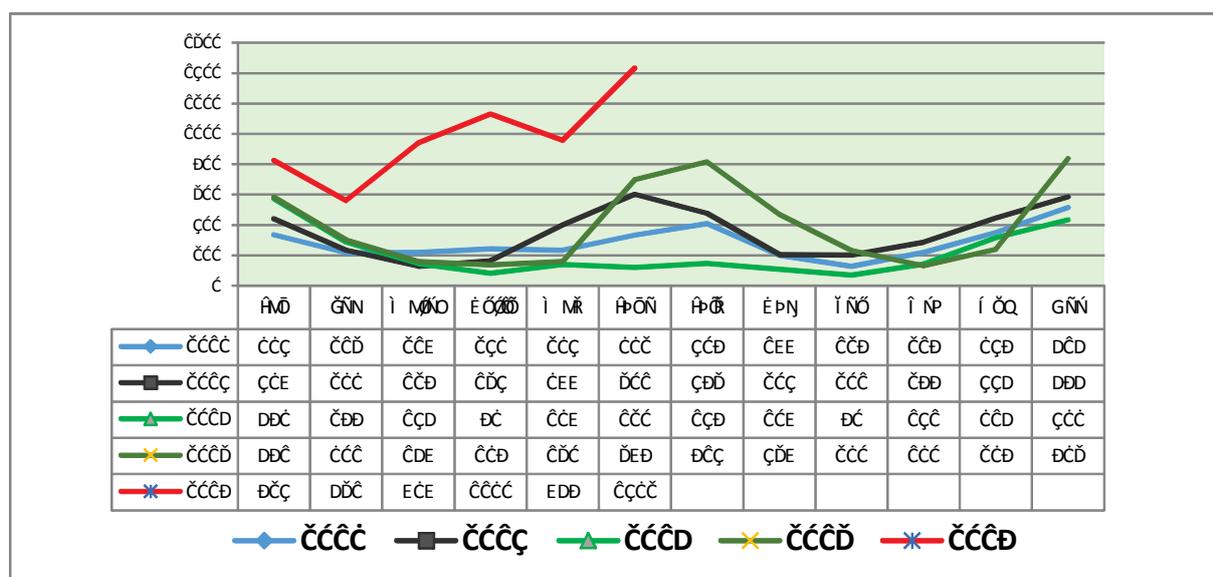
<sup>2</sup>Medical officer planning, Lady Ridgeway Hospital for Children

**Table 2: Distribution of dengue deaths and fatality rates from 2013 to 30th June 2017**

	2013	2014	2015	2016	30 <sup>th</sup> June 2017
Deaths	17	11	07	04	10
Dengue case fatality rate	0.49%	0.26 %	0.27%	0.08 %	0.17%
DHF case fatality rate	1.61%	1.22%	1.18 %	0.35 %	0.59 %

Dengue case fatality rate in 2017 shows a considerable reduction compared to the years 2013, 2014 and 2015 and the reduction in the year 2016 was the lowest. Considering DHF fatality rate, in midyear 2017, it is remarkably less compared to the years 2013, 2014 and 2015 and high compared to the year 2016.

Figure 1 : Dengue cases treated in the LRH from January 2013 to 30th June 2017



The trend of confirmed dengue cases for the year 2017 shows a marked increase compared to previous years. Out of this, the minimum has been recorded in February and the maximum in June.

With the raging dengue epidemic in the country, the influx of suspected dengue patients to LRH increased and the management of the hospital identified the need for different strategies from the previous practice of patient management in order to counter the outbreak at the LRH. The numbers coming to the OPD daily had almost doubled (LRH, 2017) and the majority presented with fever. Almost all patients needed careful evaluation by doctors and full blood count (FBC) to decide further management. Since hospital paediatric medical wards became overcrowded with dengue patients, strict guidelines were used to decide on those needing admission.

---

## Measures taken at the hospital level for management of dengue outbreak

Identifying the early need, the hospital administration summoned a meeting with the relevant stakeholders including Specialists paediatricians, Laboratory specialists, MOIC/OPD & ER, Accountant, Admin. officer, MLTs and Nurses, in order to plan the way forward.

A. Following strategies were formulated to optimize patient management and contain the outbreak at the hospital level;

I. To provide medical attention and basic investigations in the shortest possible time in the OPD

II. To ensure availability of equipment and other facilities for monitoring and treatment of patients in order to provide optimum care

III. To ensure availability of adequate human resources for patient management

IV. To ensure availability of adequate space for inward patients

V. To ensure an environment free of dengue breeding in LRH premises and prevent transmission of dengue in the hospital

VI. To ensure capacity development of staff

VII. Prevent mortality due to dengue in the hospital

### B. Implementation

#### I. Establishment of triage system at the OPD

a. A triage system was established in the OPD based on the guidelines of outbreak management by the National Dengue Control Unit of Ministry of Health.

b. All fever patients were screened to identify the severely ill, and patients with a Full Blood Count (FBC) having a platelet count less than 150,000 and transfers from other institutions were directly admitted to the Emergency Room (ER).

c. Patients with a platelet count of 150,000 to 200,000 were counselled and sent home to come back in 8 hours with a repeat FBC.

#### II. Stabilizing of all patients admitted to the ER before admitting to the ward

a. All patients who presented with a platelet count of less than 150,000 and Dengue Shock Syndrome

were admitted to the ER and following stabilizing were admitted to wards.

b. Three resident consultant pediatricians were on call for 24 hrs. in the Preliminary Care Unit (PCU).

#### III. Reorganization of the main laboratory and OPD laboratory services to minimize delays.

a. The bleeding room in the OPD was re-organized to accommodate more patients and functioned for a longer duration with two additional nurses per shift and functioned till 11.00 pm

b. A separate health assistant was employed daily to collect samples from wards to main lab and deliver reports back, three times a day.

c. A continuous audit was carried out to monitor the equipment and the reliability of the reports

#### IV. Reorganization of the wards to handle more patients admitted for inward care

a. All six medical wards have Dengue High Dependency Units (HDU) with all monitoring facilities and equipment – four/five ICU beds with multi-parameter monitors, infusion pumps, syringe pumps, PCV machines and a portable ultrasound scanner. All patients with fluid-leakage were monitored in the HDU.

b. Other patients were monitored in the acute side of the wards

#### V. Mobilization of staff from other units to handle excess number of patients

a. Medical officers and nurses, and health assistants were mobilized to medical wards and OPD to cover up inadequacies.

#### VI. Maintain a surveillance system to monitor the outbreak in order to take timely measures

a. Surveillance system was established in the Director's office to monitor the outbreak situation by recording the midnight total of all medical wards, mid night total of dengue patients, daily OPD attendance, FBC, availability of equipment and reagents.

#### VII. Capacity building

a. Training programmes were carried out to improve knowledge on dengue management for medical officers and nurses

b. Staff was made aware of the preparation to handle the outbreak situation in the hospital.

---

VIII. Prevention of transmission of dengue in hospital premises

- a. Hospital PHI was entrusted to carry out entomological surveillance and regular clean-up of the hospital environment.
- b. Fogging was also carried out three times a week with the help of Colombo Municipal Council.

**Conclusion**

In the first six months of 2017, the hospital has treated 5843 cases of dengue, which is already far exceeding the numbers treated during the year 2016. The case fatality rate was 0.59% which is more than that of the 2016 (0.35% in 2016). However, comparing with years 2013, 2014 and 2015 where DHF case fatality rates were equal to 1.61%, 1.22% and 1.18% respectively, it was a remarkable improvement since the number of cases reported during the study period is much more than total numbers in any of the above-mentioned years.

With the above measures taken for management of the dengue outbreak, LRH was able to face and manage the dengue outbreak successfully at the hospital level. However, as it was already mentioned, with all the effort there were fatalities that couldn't be averted. There were 10 patients who died of dengue fever in the LRH during the first six months of the year. From those, 08 were transferred patients from other hospitals for continuation of care and only 02 deaths from those directly admitted to the hospital for care.

**References**

1. Lady Ridgeway Hospital for Children, Colombo, Annual Report, 2106
2. Lady Ridgeway Hospital for Children, Medical Statistics Unit, 2017(unpublished data)

---

## SUSTAINED INNOVATION IN HEALTHCARE

*Wijemanne WMUS<sup>1</sup>*

---

### **Introduction**

“Innovation is defined as the intentional introduction and application within a role/group/organization, of ideas/processes/products/procedures, new to the relevant unit of adoption, designed to significantly benefit the individual/group/wider society”<sup>1</sup>. The purpose of innovation is to produce quality-products or deliver quality-services for consumers. With the ever increasing population and increasing demand for best-products and quality-services, the importance of laying foundations for innovation-driven-development has become more important than ever in the world<sup>2</sup>. However, since industrial-revolution, much of the upsurge in living-standards is due to innovation. Today, in any country the national-progress has been influenced by innovative-performances. Innovation is a driver of growth and is strengthened by technological-advancement, and a greater focus on knowledge, creation and use<sup>3</sup>.

### **Healthcare-Innovation**

Healthcare is the backbone of the society which has designed to improve life-expectancy and quality-of-life. “Healthcare-innovation is defined as the introduction of a new concept/idea/service/process/product aimed at improving treatment, diagnosis, education, outreach, prevention and research, and with long-term-goals of improving quality, safety, outcomes, efficiency and costs”<sup>4</sup>.

### **Sustained-innovation**

Sustained-innovation mainly relies on obtaining collective-decisions for a purpose, surfacing creativity of people and from teaching to recognize alternative-opportunities within the organization. An invented product/concept/service could keep an organization ahead of its competitors, yet short-lived, whilst, sustained-growth is mainly due to the steady incremental-innovations made by employees' everyday<sup>5</sup>.

Innovation-in-healthcare and its sustainability would offer a promising pathway to the development of healthcare-services to the people/country. The responsibility of creating the right psychological-conditions for innovation should be initiated from top-of-the-hierarchy. It is the top-manager, the leader, is able to consider own-assumptions about innovation and thereby creating-a-culture that foster the sustained-innovation at all levels of the organization<sup>5</sup>.

There are several strategies for sustainable-innovation in any industry/organization which would enable to create the psychological-conditions that favour inventive-thinking, regardless of the industry/size-of-organization.

1. **Establish-a-clear-direction:** The changing the minds of people (culture), would not be easy and time-consuming. Having a clearly-pronounced-mission (a-way-of-achieving-targets), permits all employees to focus on innovation, whereby organizational-performances can reach a highest-level with adding value to the organization<sup>5</sup>.

2. **Open-communication:** It is leaders' responsibility to initiate trusting-culture by sharing information on a regular-basis irrespective of good or bad<sup>5</sup>. The Southwest-airlines that had kept employees at the first-place and shared company information which in turn was beneficiary, at the time-of-Gulf-War/1990-91, when fuel-prizes flew high. Finally, the pilots could invent the ways-and-means of minimizing the fuel-consumption was a great relief for the Chief-Executive-Officer/Southwest-airlines<sup>6</sup>.

The top-managers of every organization could not have face-to-face-contact with their employees. If strategies like, conduction of monthly-meetings could be introduced to communicate with frontline-workers, where everyone could be updated with the organizational-performances<sup>5</sup>.

3. **Reduce bureaucracy:** It is the bureaucracy, “a-system-of-administration”<sup>7</sup> that limits innovation and

---

<sup>1</sup>*International Medical Management Fellow, Directorate: Strategy and Planning, Sheffield Teaching Hospitals NHS Foundation Trust, United Kingdom*

---

not the size-of-the-organization. However, in smaller-organizations there is less-bureaucracy and often move faster as they can easily innovate new-ideas, whereas larger-organizations are less-invasive, not because of the size-of-the-organization but the level-of-bureaucracy that matters<sup>5</sup>.

4. Creation of ownership, a sense of purpose in one's job, could contribute to lead to an extra-mile towards achieving objectives, as employees know that their performances would affect organizational-performances<sup>8</sup>.

5. The consistency-in-rewarding-system: Rewarding-system for employees in any organization should be based on what they want to reinforce. Rewarding the individual/team responsible for any higher-performances results in a competitive-atmosphere among the teams and that discourages the rest-in-the-organization. If the organization values cross-functional-collaboration which contributes to maximum performance, the team leaders should not be rewarded based on the unit-performance<sup>5</sup>.

6. Tolerance for risk-and-failure: Though innovation-strategies are required for any organization to move forward, innovation itself is a risk. Employees attempt to take risks only if they know the goals clearly and have a good insight about the frame-work on which they operate<sup>5</sup>. If succeeded in innovation then the organization will flourish. If it fails, failures could be added to the experience.

Developing trust is the strategy developed by the Toyota's-Production-System. When there was any opportunity for improvement, the changes were initiated, mainly based on the trust the employees have developed<sup>9</sup>.

7. "Creative-abandonment" defined by Peter Drucker which means projects-and-processes that no longer be actively contributing to achieve organizational-goals-and-objectives should be abandoned and pave the way for new, progressive-activities<sup>10</sup>.

### Conclusion

Innovation is a dire need in today's world for any industry/organization to move forward. However, if the innovation is not sustainable, the resources (time, employee-energy etc.) could be wasted. Sustainable-innovation requires optimism which means, harnessing positive-attitude for reaching higher-performance in a continuous manner and overcoming barriers-to-innovation through prioritizing human values such as trust, engagement, and motivation.

### References

1. Yale University. About ITS: Yale University[Internet].Yale University; 2018 [Cited 2018 March 25]. Available from : <https://its.yale.edu/about/innovation-its/what-innovation>
2. Jewell, Catherine, and Wunsch Vincent. WIPO Magazine:World Intellectual Property Organization . World Intellectual Property Organization; 2017 June [cited 2018 March 29]. Available from : [http://www.wipo.int/wipo\\_magazine/en/2017/03/article\\_00\\_04.html](http://www.wipo.int/wipo_magazine/en/2017/03/article_00_04.html)
3. OECD. Innovation and Growth Rationale for an Innovation Strategy [internet].OECD;2007 [cited 2018 March 30]. Available from :<http://www.oecd.org/sti/inno/39374789.pdf>
4. Omachonu V K, Einspruch N G. The Innovation Journal: The Public Sector  
Innovation Journal. Innovation in Healthcare Delivery Systems: A Conceptual Framework; 2010 [cited 2018 March 20]; Volume 15(1), 2010, Article 2. Available from : [https://www.innovation.cc/scholarly-style/omachonu\\_healthcare\\_3innovate2.pdf](https://www.innovation.cc/scholarly-style/omachonu_healthcare_3innovate2.pdf)
5. Innovation Tools.com.7 Strategies for Sustaned Innovation ; 2013 [cited 2018 March 21] Available from : <http://www.innovationmanagement.se/imtool-articles/7-strategies-for-sustained-innovation/>
6. Finbox. Value Investing:valuelwalk.com . valuelwalk.com ;2017 August 29. [cited 2018 March 31] Available from : <https://www.valuelwalk.com/2017/08/warren-buffett-invested-southwest-airlines>
7. WebFinance Inc. . Bureaucracy: Businessdictionary;2018. [cited 2018 March 26] Available from : <http://www.http://www.businessdictionary.com/definition/bureaucracy.html>
8. Nelson N C. Give Employees a Sense of Ownership. americanventuremagazine.com;2006 October 3 [cited 2018 March 27] Available from <http://www.noellenelson.com/docs/American%20Venture%20Magazine%20-%202010-3-06.pdf>
9. Watanabe T. Innovation:Toyota Industries Cooperation . Toyota Industries Cooperation; 2018. [cited 2018 March 31] Available from : [https://www.toyota-industries.com/innovation/dna/advance/person\\_9/index.html](https://www.toyota-industries.com/innovation/dna/advance/person_9/index.html)
10. Cook, J. John D Cook Consulting: johndcook.com . johndcook.com; 2008 November 3 [cited 2018 March 31] Available from : <https://www.johndcook.com/blog/2008/11/03/peter-drucker-and-abandoning-projects/>

---

# ASSESSMENT OF KNOWLEDGE AND PRACTICES AMONG DENTAL SURGEONS IN THE INSTITUTE OF ORAL HEALTH MAHARAGAMA, REGARDING QUALITY IMPROVEMENT AND PRODUCTIVITY CONCEPTS AND THE IDENTIFICATION OF BARRIERS FOR IMPLEMENTATION

Murage C<sup>1</sup>, Rajapaksha RMSP<sup>2</sup>, Ruhunage KG<sup>2</sup>, Pahalavithana GU<sup>3</sup>, Usgodaarachchi U<sup>4</sup>

---

## Abstract

**Objective:** The Institute of Oral Health Maharagama (IOH-M) is one of the main institutions providing dental services to the population. This study is aimed to assess the knowledge of Quality Improvement (QI) of Dental Surgeons (DSs) at IOH-M in order to provide quality patient care.

**Methodology:** A descriptive cross-sectional study was carried out among Dental Surgeons who are attached to the IOH. Data was collected through a self-administered questionnaire.

**Results:** Out of 52 dental surgeons, 44 (85%) responded. Among the respondents, 61% expressed that they are aware of the meaning of 'quality'. However, only 22% of them were able to give the correct meaning. Of the respondents who were exposed to previous training, 79% indicated that they knew the meaning of 'quality' but only 29% could give the correct meaning. When considering the barriers to practice quality concepts at IOH, 55% of the respondents indicated the presence of barriers for implementation. Commonly identified barriers were unsatisfactory work environment, insufficient instruments/materials and 'limited time'. Thirty three percent of respondents mentioned suggestions to overcome barriers. 'Exposure to training programs on QI', 'reduced work-load' and 'improved working environment' were common suggestions mentioned.

**Conclusion:** The knowledge of Dental Surgeons at IOH on QI is poor and therefore there is a need for further training on QI. However, the other identified barriers should also be addressed before implementing the QI programs.

*(Key Words: Quality improvement, Institute of Oral health)*

## Introduction

Simply, the word quality is defined as meeting of customers' expectation. "Quality is a process of meeting the needs and expectations of the customers, both internal and external. Quality can also be referred to as a continuous process of incremental improvement" (WHO 2004)

Quality improvement (QI) is a systematic, formal approach to the analysis of practice performance and efforts to improve performance. Understanding and properly implementing QI is essential to a well-functioning service and is necessary for any institution interested in improving efficiency, patient safety, or clinical outcomes. Therefore, QI ultimately leads to enhance the productivity (WHO 2004).

Health care services have a distinct position among other services due to the risky nature of services. Therefore, QI in healthcare is considered as an important aspect in order to achieve best outcomes. Quality in health can be defined as safe, efficient, effective, patient-centered, equitable and timely provision of health service to patients (Manual for master trainers, Health Care Quality and Safety 2015). A study done in USA shows that the greater the percentage of hospital staff, senior managers and physicians participating in QI teams, the better the scores achieved in hospital quality indicators (Weiner Bryan J et al 2006).

The benefits of quality improvement are well documented. It helps to improve employee morale by not blaming the employee for the problems in the system. Instead, it focuses on the problems in the process, not the people performing the process. Because QI focuses on continuously improving the organization's performance and removing problems from the system, customer satisfaction increases. Removing problems from the process will also result in

---

<sup>1</sup>Deputy Director IOH

<sup>2</sup>Planning Unit IOH

<sup>3</sup>DTTS IOH

<sup>4</sup>Training Unit IOH

---

fewer errors and less repetition of work on the part of the employees resulting in increased productivity.

The evolution of a National Quality Awareness program in the Sri Lankan Health services dates to 1989. The Quality Secretariat of the Ministry of Health was established in July 2003. In 2012 it was changed to a Directorate of Health care Quality and Safety. In the year 2000, a formal quality assurance program was initiated at Castle Street Hospital for Women. This program was extended to the other healthcare institutions from 2004.

Somatunga et al (2015) studied factors influencing Continuous Quality Improvement program (CQI) in Government Hospitals in Sri Lanka and identified that monitoring systems, physical resources and training are major contributors for CQI in the government hospitals in Sri Lanka and further stated that teamwork is of less value.

In healthcare services in Sri Lanka, the management structure of a Health Institution consists of Directors and Unit Heads and in most institutions, they are either Medical Officers or Dental Surgeons. Moreover, they are the decision makers in the delivery of health care services. Therefore, they have to play a major role in the QI program in any health institution.

Rannan-Eliya et al (2015), after assessing the quality of in-patient care in public and private hospitals in Sri Lanka, reported that the quality of inpatient care in Sri Lanka was comparable to the levels of upper-middle income Asian countries and often approaches that in developed countries. Moreover, they reported that the quality in public sector is better than the private sector in many areas.

Institute of Oral Health (IOH), is one of main institutions in Sri Lanka providing dental services to the population. This institute was started in 1960 as a Dental Therapist Training School (DTTS). With gradual development, it presently consists of the DTTS, Out Patients Department (OPD), five specialized dental clinics, in-service training unit and a research unit. On an average day it provides clinical services to around 500 dental patients.

At the management meetings, it was decided to introduce QI concepts into IOH.

### **Objective**

Since the involvement of top management is important in introducing QI concepts, this study is aimed to assess the knowledge of quality dimensions, quality techniques and quality improvement practices of DSs at IOH-M.

### **Methodology**

This is a descriptive cross-sectional study which was carried out among dental surgeons who are working at IOH. All DSs (52), employed as either permanent or temporary basis including post graduate trainees were included in the study. Pre-tested self-administered questionnaire was used to collect information. The questionnaire consisted of three parts; socio-demographic information, awareness of quality, current practices and barriers & suggestions for improvement of services. DSs were explained about this research before administering the questionnaire. In order to maintain the anonymity and unbiased expression, the name of the DSs was not asked. Ethical clearance was obtained from the Medical Faculty, Colombo and the approval to carry out this research was obtained from Deputy Director General (Dental Services) and the Deputy Director, IOH. Data was analyzed by using SPSS software program.

---

## Results

**Table 1 Socio-demographic characteristics of Dental Surgeons (n = 44) at IOH**

Category		N	%
Age group	<40yrs	19	43.2
	40-49yrs	17	38.6
	50yrs or more	8	18.2
Sex	Male	6	13.6
	Female	38	86.4
Duration of services	10yrs or less	25	56.8
	11-20yrs	12	27.3
	>20yrs	7	15.9
Qualifications	Basic degree (BDS)	21	47.7
	Postgraduate diploma/degree	23	52.3
Exposed to quality program	Yes	14	31.8
	No	29	65.9
	Not responded	1	2.3

Out of 52 DSs at IOH, 44 (85%) responded. Majority of the respondents were females belonging to less than 40 years of age with a service duration of less than 10 years. Majority of the respondents were having postgraduate qualifications of either a diploma (DHDP) or a degree (MSc/MD). Only 31% of the respondents were exposed to QI program previously (Table 1).

**Table 2 Awareness of the term 'quality' among Dental Surgeons at IOH**

Category		All DSs		With Postgraduate		Exposed to QI program	
		N	%	N	%	N	%
Awareness of quality	Yes	27	61.4	18	78.3	11	78.6
	No	13	29.5	3	13.0	3	21.4
	Not responded	4	9.1	2	8.7	0	0.0
Total		44	100.0	23	100.0	14	100.0

---

**Table 3 Describe the term 'quality' out of who have responded 'yes' to Awareness of the term quality'**

Category	All DSs		With Postgraduate		Exposed to QI program		
	N	%	N	%	N	%	
Term 'Quality' described	Correctly	6	22.2	2	11.1	4	28.6
	Incorrectly	14	51.9	12	66.7	5	35.7
	Not responded	7	25.9	4	22.2	5	35.7
Total		27	100.0	18	100.0	11	100.0

Among respondents, 61% expressed that they know the term 'quality' (Table 2). However, when they were asked to describe the term 'quality', only 22% expressed correct answers (Table 3). Among the DSs with postgraduate qualifications, 77% know the term 'quality' but only 9% explained the term correctly (Tables 2 & 3).

Among the DSs who had previous exposure to training programs on quality improvement, 79% responded that they know the term 'quality' and of them 29% has given correct answers (Tables 2 & 3).

**Table 4 Barriers to practice quality concepts at IOH**

		N	%
Barriers to practice 'quality' at IOH Maharagama	Yes	24	54.5
	No	11	25.0
	Not responded	9	20.5
Total		44	100.0

---

**Table 5 Identified barriers to practice 'Quality concepts' at IOH**

	N	%
Barriers mentioned	21	47.7
Not mentioned	23	52.3
Total	44	100

Identified barriers	N
Limited time	8
Inadequate instruments/materials	10
Lack of trained manpower	5
Unsatisfied work environment	13
No job satisfaction	7
Other	3
Total number of reasons	46

When considering the current practices regarding QI, none of the DSs mentioned that they used to practice those and 55% of them mentioned that there were barriers to practice quality concepts at IOH (Table 4). However, only 48% DSs described the barriers (Table 5). Commonly identified barriers were unsatisfactory work environment (13 responses), insufficient instruments/materials (10 responses) and 'limited time' (08 responses (Table 5).

**Table 6 Suggestions given to overcome barriers**

	N	%
Suggestions given	15	33.3
No suggestions given	30	66.7
Total	45	100

Description of suggestions	N
Reduce workload	4
Need materials/instruments	2
Increase trained manpower	2
Improve working environment	4
Increase job satisfaction	3
Increase knowledge/training	6
Other	2
Total number of suggestions	23

---

Thirty three percent of respondents mentioned suggestions to overcome barriers. 'Exposed to training programs on QI' (6 responses), 'reduce work-load and improve working environment' (4 responses each) were common suggestions mentioned (Table 6).

### Discussion

This descriptive survey was conducted to assess the knowledge & practices, among DSs regarding quality improvement and productivity and also to identify perceived barriers to implement them at IOH-M. To achieve this objective, self administered questionnaire was given to all dental surgeons attached to IOH.

According to the results it was observed that the awareness of quality concepts of DSs at IOH was not at acceptable level. Even though most DSs knew the term 'quality', very few managed to express it correctly irrespective of their qualifications (Tables 2 & 3). Based on the results it is reasonable to assume that the postgraduate and basic graduation programs for DSs in Sri Lanka possibly not address this aspect adequately. However, DSs who had exposed to quality improvement programs expressed better awareness (Tables 2 & 3) suggesting that such programs would provide beneficial results.

When considering the QI practices, none of the DSs mentioned that they used to practice those at IOH and mentioned that 'unsatisfactory work conditions', 'inadequate supplies' and 'limited time' as barriers for practicing quality work (Table 5). When asking suggestions to improve the barriers identified, DSs reported that the overcome the barriers is needed and clearly identified a need of training (Table 6) thus justifying their understanding of the importance of QI at the institution.

Since this was the first study conducted among DSs in Sri Lanka, comparison of these results of the present study could be done with the findings of other local and international studies.

Theurer et al (2014) also reported the lack of staff, staff workload, lack of communication, poor leadership, certain attitudes of some health workers such as laziness, complacency and absenteeism are some of the barriers that could be considered as barriers. After conducting a study in government hospital in Sri Lanka Mohanty et al (2008), has reported that organizational factors, interpersonal factors, environmental factors, facilities and economic factors could be influenced the implementation of QI programs in healthcare systems. Somathunga et al (2015) has reported 08 major barriers QI program. Those are; insufficient training, first-line supervisor resistance, insufficient managerial & union support, poorly defined or lack of organizational objectives, lack of planning no time to do improvement of work and incompatible rewards.

When comparing those with the findings of the present

study, 'unsatisfactory work conditions', 'inadequate supplies' and 'limited time' are in consistent with the findings of Somathunga et al (2015) & Turner (2014). Identification of 'reduce work-load' in this study as a measure to overcome barriers also reflecting the factor that was identified by Somathunga et al (2015) as 'no time to do improvement of work'.

In general, these are the common factors identified in any institution if not properly organized. Poorly designed and coordinated processes frequently resulting repeated work and frequent delays of supply of materials and equipments and even for a simple maintenance work in the clinic. If such things do occur frequently it is extremely difficult to provide quality services to the patients even with the competent staff. This situation gradually leads to lack of motivation of the staff as well as poor patient satisfaction.

Wring the in the introductory chapter of the Practical manual of quality improvement in primary health care published by the WHO, AL-Assaf (2004) mentioned key principles that should be considered for implementing QI programs. Those are: that leadership with active participatory commitment, customer focus activities, continuous process-oriented and outcome-driven improvements, employee empowerment, proactive improvement, data-driven decision-making interdisciplinary team-work and education, retraining & recognition should be considered as key components to be addressed (WHO 2004). Some of the areas are also identified in this study as well.

After evaluating training program on QI among hospital staff by Siverbo et al (2004) reported that there was an improvement of attitudes among participants in addition to improved work performances. However, they further explained that the training should be specific for different categories. Finally, they concluded that more systematic approach towards various healthcare interventions would be needed in order to fully implement a QI mindset (Sivebro et al 2004).

Establishing a quality improvement process in resource-limited settings is an enormous task, considering the host of challenges that these facilities face. The steps towards changing the status quo for improved quality care require critical self-assessment, the willingness to change as well as determined commitment and contributions from clients, staff and management (Agyeman-Duah et al 2004). Hence, in order to establish of a QI program, at IOH-M, those identified factors should be considered. Favorable attitudes of dental surgeons on the QI training programs would be a positive factor for implementing such programs.

---

### Conclusions & recommendations

Hence based on the results it is reasonable to conclude that the knowledge of Dental Surgeons at IOH on QI is poor. This highlights the requirement on introducing QI concepts to them as these aspects are not covered in the basic and most postgraduate programs for Dental Surgeons. However, the identified barriers need to be addressed prior to implementation of such programs.

**Acknowledgements:** Special thanks to all the staff of IOH who helped us to complete this study successfully,

**Sources of support:** Nil

**Conflict of interest:** Nil

### References

Ministry of health. (2015) Manual for Master Trainers Healthcare Quality & Safety. Directorate of healthcare Quality & safety, ministry of health and Indigenous Medicine.

Mohanty R P, Lakkhe R R (2008), TQM in Service Sector, JAICO Publishing House Fourth Edition

[Rannan-Eliya RP, Wijemanne N, Liyanage IK, Dalpatadu S, de Alwis S, Amarasinghe S, Shanthikumar S \(2015\) Quality of inpatient care in public and private hospitals in Sri Lanka. Health Policy and Planning, vol 30, 30 Suppl 1:i46-58](#)

Siverbo K, Eriksson H, Raharjo H. (2004) Attitudes towards quality improvement among healthcare professionals; lessons from a hospital-wide quality initiative. *International Journal of quality and service sciences* vol. 6(2/3), pp.203-212.

Somatunga L C, Sridharan S, Refai M. A. C. M, Malavige K. K, Gamini L. P. S (2015) Factors influencing continuous quality improvement programme in Government hospitals of Sri Lanka. *International Journal of Science & Technology Research*, 04(06), pp. 118 - 122.

Theurer A, Josephine Nana Afrakoma Agyeman Duah, Charles Munthali NA and FN (2014) Understanding the barriers to setting up a healthcare quality improvement process in resource -limited settings. *BMC Health Serv Res*. 2014;14(1)

Josephine Nana Afrakoma Agyeman-Duah, Antje Theurer, CharlesMunthali, Noor Alide and Florian Neuhann. (2014) Understanding the barriers to setting up a healthcare quality improvement process in resource-limited settings: a situational analysis at the Medical Department of Kamuzu Central Hospital in Lilongwe, Malawi *BMC Health Services Research* 14:1

Weiner Bryan J, Jeffrey A Alexander, Stephen M Shortell, Laurence C Baker, Mark Becker, and Jeffrey J Gepper, (2006) Quality Improvement Implementation and Hospital Performance on Quality Indicators, *Health Service Research*. 41(2): 307–334.

World Health Organization (2004) Quality improvement in primary health care; A practical guide by Assaf F. Al-Assaf, Mubasha Sheikh. World Health Organization.

---

## **REDUCTION OF NEEDLE STICK INJURIES AMONG NURSES AND HEALTH CARE ASSISTANTS THROUGH AN INTERVENTION: CHANGING ATTITUDE AND IMPROVING AWARENESS, IN THE NATIONAL HOSPITAL OF SRI LANKA (NHSL)**

*Prathapasinghe ID<sup>1</sup>, Dharmarathne SD<sup>2</sup>*

---

### **Introduction:**

Cutaneous injuries, resulting from needles sticks, are a major issue for all health care workers and cause a considerable threat of spreading blood-related infections. Needle stick injuries (NSI) are, injuries occurring with injection devices, intravenous cannulas or devices utilized to join elements of intravenous infusion units. The reason for injuries include, category and design of the injecting needle, issue of needle capping, transporting blood samples, cleaning process, handling sharps, and suturing process. Most of Health Care Workers (HCW), nurses, junior staff, laboratory staff and cleaning service staff are vulnerable to these injuries. "As a result, these workers are vulnerable to occupational acquisition of different blood borne infections, including the pathogens causing Human Immune Deficiency Virus (HIV)/ Acquired Immune Deficiency Syndrome (AIDS) and Hepatitis B" (Wilburn et. al. 2004). The risk of transmitting HIV to a staff member after exposure to infected blood has been calculated as three in one thousand (3:1000). According to a WHO study, the annual estimation for exposure of health care staff to blood-borne pathogens was 2.6% for Hepatitis C virus, 5.9% for Hepatitis B Virus (HBV) and 0.5% for HIV.

As needle stick injuries are often under reported, injuries recorded through standard occupational reporting systems may underestimate the real rate of injuries. NSI have several indirect consequences in health care service delivery especially in developing countries, where the skilled staff is inadequate, proportionate to the burden of infectious and non-infectious diseases. These injuries create emotional stress in addition to the above-mentioned medical consequences, among the health staff. Missing working days directly affect the services, resources and finally productivity of the country.

### **Justification:**

NHSL has a well strengthened Infection Control Unit headed by a Consultant Microbiologist and a team consisting of a nursing sister with 13 infection control nursing officers. According to their records, 405 reported NSI during the year 2015 (NHSL, 2015), of that, 199 nursing officers and 142 health assistants have been identified and the rest were Medical officers. Protective measures taken after the NSI are at a satisfactory level. In the year 2016, 261 nursing officers, 211 health assistants and 52 Medical officers (Total 524) recorded NSIs. The most risky procedures identified were, blood drawing, cannulation, and theatre procedures. In a study of 155 health care staff conducted in this institute previously, 82 (59%) of injuries were caused by needle sticks. According to the Infection control unit records, the nurses showed the highest incident reporting rate,  $p=0.024$  (Vitharana et al, 2005). Basic post-exposure management was at a satisfactory level among nurses and unsatisfactory among the Health care assistants.

By considering above details and the information obtained from the hospital sources, it is justified to conduct a proper study to identify the gaps in institutional managerial methodology to reduce NSI among health care staff and suggest possible solutions to overcome them.

### **General Objective**

To reduce NSI among nurses and health care assistants in the National Hospital of Sri Lanka.

### **Specific Objectives**

1. To assess the gaps in current managerial methodology regarding NSI among nurses and health care assistants in selected wards in the National Hospital of Sri Lanka.

---

<sup>1</sup>Senior registrar in Medical Administration, Deputy Director, TH Peradeniya

<sup>2</sup>Professor of Community Medicine, Faculty of Medicine, University of Peradeniya

---

2. To design new interventions to improve managerial practices regarding prevention and mitigation of harm from NSI among nurses and health care assistants in the National Hospital of Sri Lanka.

3. To design new interventions to change the attitudes among nurses and health care assistants in the National Hospital of Sri Lanka.

4. To assess the outcome after intervention.

### **Methodology:**

This Interventional study was conducted over a period of nine months from December 2016 to August 2017. Random sampling technique was applied to select the appropriate number of nurses and health care assistants from selected medical and surgical wards and Accident and Emergency (A&E) Care Service.

### **Study design:**

An intervention was conducted on NSI for nurses and health care assistants at NHSL. The staff was selected from surgical wards and the majority from the A&E Care service, who reported for duty during the study period. Selected staff were always those handling patients.

### **Sampling:**

Formula adopted to calculate the sample size is given below.

$$n = \frac{Z^2 \times p(1-p)}{d^2}$$

n= minimum sample selected    z= critical value of 95% confidence interval

d= margin of error                      p= prevalence rate

Required size of the sample was 372.

Because of the expected non-respondents, 4% was added. Therefore, 386 were selected for the study. A total of 193 nursing staff and 193 health care assistants were selected for the study on the above selection criteria. Written informed consent was obtained from the selected staff.

### **Pretesting:**

Pretest was performed among 15 Nursing officers and 15 Healthcare assistants in the Teaching Hospital, Peradeniya which is a Tertiary care setting with similar characteristics. A post-test was done with the same group after two weeks.

### **Mode of conducting the study:**

The study was conducted in three components - pre-interventional, interventional and post-interventional.

### **Pre-interventional component:**

To identify the gaps in the present managerial practices on NSI and their issues, a pre-tested structured questionnaire on knowledge, attitude and practices was used. It was piloted among a group consisting of 30 staff members (15 NO & 15 HCA), at the Teaching Hospital, Peradeniya which has a similar setting. The results were used to prepare the final version of the tool, which consisted of four sections: (i) supportive information; (ii) incidence of NSI, circumstances leading to the incident and information on work habits; (iii) hospital set up on incidence reporting; and (iv) In-service training undergone, attitudes on prevention of NSI, and recommendations for improvements. The marks for each question were allocated by using the Likert's scale 1-5.

In addition, a qualitative assessment (FGDs) was done along with the thematic areas as safety measures, facilities and awareness.

### **Interventional component:**

Two separate in-service programmes as designed from the outcome of the pilot studies were conducted by the researcher for both categories of the study population.

### **Post-interventional component:**

Post-interventional assessment was done to assess the outcome of the conducted interventions.

Outcome of the interventions were assessed by measuring the pre- and post-test knowledge, attitude, and practice of the same study participants. The same self-reporting questionnaire was administered. The questionnaire was pre-tested and validated.

## Results

**Table 1, Identification of the gaps in current managerial methodology and its post interventional improvement**

Variable	P	Z	Mann-Whitney U	Wilcoxon w	Mean Pre - Post	Total score Pre – post
N/O training on Reporting NSI	0.05	-1.92	1037.00	3315.00	49.48-60.41	2356-3315
HCA training on Reporting NSI	0.0001	-5.77	413.50	1448.50	32.19-60.89	1449-2923
N/O Awareness on *PEP	0.003	-2.98	856.00	3202.00	47.09-64.97	2469-3202
HCA Awareness on PEP	0.049	-1.97	960.00	1952.00	42.43-52.35	1952-2513

\*Post exposure prophylaxis.

It is Evident from the table, 1 summarize the gaps related to NSI management. This achieved the first specific objective. Both Groups (NO and HCA) evident a highly significance different after interventions, on Reporting system for NSI (0.05, 0.001). Awareness on Post Exposure prophylaxis was also improved significantly (0.003, 0.049). Total scores and mean values also enhanced numerically (NO 2469 to 3202 and HCA 1952-2513). Both Nursing officers and HCA were aware and trained on NSI reporting and enhanced the mean values after interventions (NO 49.48 to 60.41 and HCA 32.19 to 64.97).

Awareness on PEP shows a highly significance difference between the pre and post interventional stages in both categories (NO,  $p=0.003$ , HCA,  $p=0.049$ ). Therefore, According to this results correctable gaps in related to managerial methodology of NSI were identified in reporting and PEP. Those gaps were identified in the Focus group discussions as well. After this achievement suitable interventions were applied accordingly.

**Table, 2 Awareness on post exposure prophylaxis (Before Intervention)**

Variable	Not aware%	Partially aware%	Well aware %	Total%
N/O Awareness on *PEP	1.5	35.2	63.3	100
HCA Awareness on PEP	35.9	56.8	7.5	100

\*Post exposure prophylaxis

Referring with Table.1, Table 2 further evident that only 7.5% (n=15) of HCA well aware on the available HIV prophylaxis. Out of nursing officers 1.5% (n= 3) were not known about the PEP.

**Table , 3 Perception on preventability of NSI (Before Intervention)**

Perception	Un preventable%	No Perception%	Yes %	Absolutely yes%
N/O perception on preventability	2.4	5.1	46.3	46.2
HCA perception on preventability	13.2	30.1	32.8	23.9

Table 3, evident perception on preventability was poor among HCA 43.4% ( 13.2% + 30.1%, n=84) and 23.9% (Absolutely yes, n=46) of them had a favorable attitude on Preventability. Nursing officers had a good perception on that (46.3 + 46.2% = 92.5%, n= 178) reveals as yes or absolutely yes.

**Table, 4: Nursing officers/ Statistical representation of pre and post interventional scores**

Statistical value	General Score	Practice Score	Attitude Score	Knowledge Score	Total Score
Mann-Whitney U	508.500	671.500	713.000	738.000	627.500
Wilcoxon W	1211.500	1451.500	1454.000	1518.000	1293.500
Z	-1.741	-.891	-.286	-.226	-.231
P value	.082	.373	.775	.821	.817

Table.4, further evident the non-significance difference among Nursing officers on Knowledge attitude and practice. All the p values observed 0.05 < and z evident with negative findings.

**Table, 5: HCA / Statistical representation of pre and post interventional scores**

Statistical value	General Score	Practice Score	Attitude Score	Knowledge Score	Total Score
Mann-Whitney U	508.500	671.500	713.000	738.000	627.500
Wilcoxon W	1211.500	1451.500	1454.000	1518.000	1293.500
Z	-1.741	-.891	-.286	-.226	-.231
P value	.082	.373	.775	.821	.817

---

According to the Table.5, it is evident that only Knowledge component among the healthcare assistants indicates a significant difference between pre and post interventional stages. Therefore in both categories Attitude and practice component doesn't show a significant different.

#### **Discussion:**

Gaps were identified in the Managerial methodology of post exposure care and prophylaxis. Evident from the table, I summarize the gaps related to NSI management. This achieved the first specific objective. Both Groups (NO and HCA) evident a highly significance different after interventions, on Reporting system for NSI (0.05, 0.001). Awareness on Post Exposure prophylaxis was also improved significantly (0.003, 0.049) Mean value enhanced, for NO 47.09 to 64.97 and HCA from 42.43 to 52.35). Both Nursing officers and HCA were aware and trained on NSI reporting and enhanced the mean values after interventions (NO 49.48 to 60.41 and HCA 32.19 to 64.97). Therefore, if the population was distributed normally the pre interventional value for nursing officers was closure to 50% which was matched with the previous finding of the study done at Colombo District Major Hospitals including the NHSL where the present study was performed. "Nearly 50% of the health care workers knew that they should seek HIV PEP when their mucous membranes or non-intact skin is exposed to blood" (Karawita et al, 2012).

An Indian study expressed, that years of working experience, training and Knowledge score, use of universal precaution theory including needle capping, and wearing gloves associated with the NSI ( Janjua et al.2007b). In the present study, researcher explored those findings further. In the aspect of service experience in the Health Department, Majority of the sample was belonging to the category of years 11 to 15 which was the middle (3rd) response out of five and score 3.0 was given for that. Since this was a categorical variable, median (3.0) was selected to explain central tendency. As in the above Indian study, needle capping procedure has been improved from the mean value, 61.73 to 10.4 for HCA which was a highly statistically significant (p=0.0001).For nurses it was from 50.7 to 43.6.

When the Knowledge attitude and practices were taken in to consideration There was no significance difference between pre and post interventional stages. It is observed the time constraint contributes to this result because after introduction of the WHO injection safety tool kit positive results may not be achieved within such a short period.

#### **Conclusion and recommendation:**

It was recommended to conduct more awareness programs and training modules on post exposure management of NSI because it has shown positive results in both categories.

Other way is to take policy decision to Prohibit Needle recapping in Island wide hospitals with a special emphasis on operation theatres. It was observed incidence rate was higher in larger hospitals (Sharma et al, 2010). In the present study also, evident that the incidence rate for the year 2016 was 0.17 per occupying bed. Therefore researcher suggest to strengthen the larger hospitals ( NHSL and other major teaching hospitals in Sri Lanka ) by way of recruiting more consultant Microbiologists and other staff to their infection control units with provision of equipment , and instrument with more safety precautions and devices such as IV catheters.

Number of in service programs for the staff should be scheduled with the Assistance of Education Training and research unit Ministry of health. It was evident from the present study, Knowledge scores had a significant different value after the intervention.

It is recommended to conduct further studies with a more time gap between pre and post interventional stages.

#### **References:**

- Au E, Gossage JA, Bailey SR. The reporting of needle stick injuries sustained in theatre by surgeons: are we underreporting? *J Hosp Infect* 2008; 70: 66-70.
- Carry, A: 2016; Definition for NSI; Percutaneous needle stick and sharps injury: *J Med* 2016; 356: 2693-9.
- Daley, K; Needle stick injuries and healthcare workers, who contracted HIV from needle stick injuries [http://www.who.int/occupational\\_health/activities/1anaism.pdf](http://www.who.int/occupational_health/activities/1anaism.pdf) 2004.
- FitzSimons D, Francois G, De Carli G, Shouval D, Pruss-Ustun A, et al. (2008) Hepatitis B virus, hepatitis C virus and other blood-borne infections in healthcare workers: guidelines for prevention and management in industrialised countries. *Occup Environ Med* 65: 446-451. [Article:PubMed/NCBI Google Scholar](https://pubmed.ncbi.nlm.nih.gov/16811111/).
- Janjua J, Perry J, Gomaa A, Phillips EK (2007) the impact of U.S. policies to protect healthcare workers from bloodborne pathogens: the critical role of safety-engineered devices. *J Infect Public Health*: 62-71. Vitarana, S ; Karavita ; A Needle stick injury among health care workers: NHSL; 2005,7.
- Wilburn SQ. Needle sticks and sharps injury prevention. *Online J Issues Nursing* 2004; 9: Manuscript 4.
- Wilburn, SQ MPH, RN .Needlesticks and other sharps injuries per year among hospital workers in the United States CDC, 2004. <http://www.nursingworld.org/MainMenuCategories;ANAMarketplace;ANAPeriodicals;OJIN;TableofContents,Volume92004;No3Sept04;InjuryPrevention.html> Sep 30, 2004. .