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THE MISSION OF SLJHR

To efficiently and promptly publish rigorous, accessible, and relevant material that will help health professionals in Sri Lanka in their practice, lifelong learning, and career development



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About the journal

Aims and Scope

Sri Lanka Journal of Health Research (SLJHR) is the official journal of the Ministry of Health, Sri Lanka.

The SLJHR is an open-access, peer-reviewed journal which is intended to be published biannually. The SLJHR publishes the following types of articles: leading articles; original articles (original research, systematic reviews and meta-analyses); clinical audits; cover story; picture story; brief reports; updates on evidence-based practices in health policy and systems; continuing education; perspectives; opinion articles; commentaries; correspondence/letters to the editor; and notices/obituaries/appreciations which are of relevance to the practising health professionals, policymakers and academics.

The scope of SLJHR extends to medical, nursing, professions supplementary to medicine, allied professions, complementary and alternative medicine and other health and health-related fields. The mission of SLJHR is to efficiently and promptly publish rigorous, accessible, and relevant material that will help health professionals in Sri Lanka in their practice, lifelong learning, and career development. Its main focus is research; however, it will support sharing of health innovations and best practices as well. It follows the guidelines and standards of the International Committee of Medical Journal Editors (ICMJE) and the Committee on Publication Ethics (COPE).

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The SLJHR does not charge any article processing or publishing fee.

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Message from the Minister of Health

The dissemination of knowledge and information accumulated through exceptional research and development is critical in improving healthcare. I am pleased to report that, despite an unprecedented epidemic, the Ministry of Health has maintained its commitment to encouraging research, sharing knowledge, and disseminating information and wisdom. The Sri Lanka Journal of Health Research (SLJHR) has published its first issue, marking the momentous accomplishment of compiling different research under one publication.

The main objective of SLJHR is to improve healthcare within an overarching research culture. Health research has immense value to the nation as it provides important information about disease trends and risk factors, outcomes of treatment and public health interventions, functional abilities, care patterns, and health care costs, as well as generating complementary insights in a variety of ways. Health research should result in action while research outcomes must guide policy and program development as well as the delivery of health services. To be effective, healthcare interventions should be evidence-based and grounded in solid research.

I appreciate the dedication of the editorial board in making this publication a success and the enthusiasm of all who contributed in different ways. I hope this will pave the way to amelioration in research activities in the Sri Lankan health system, enhancing the well-intentioned efforts of national health programs, closing not only the gap in health disparities but also the gap in knowledge between different sectors and disciplines.

Hon. (Dr) Keheliya Rambukwella

Minister of Health, Sri Lanka



Message from the Secretary of Health

The Ministry of Health is committed to evidence-based policy development and interventions. There has long been a timely need for a scholarly journal published by the Ministry to disseminate evidence generated within the healthcare field, which is open to all categories of healthcare staff. Over the past decade, a lot of research has been conducted in the Ministry and it seems only a few have been published in peer-reviewed journals. Unpublished health system research has no social value and impedes scientific progress.

The Ministry of Health of Sri Lanka has embarked on a mission of publishing “Sri Lanka Journal of Health Research” (SLJHR) that would extend the access to research publications, supporting evidence-based policy development, strengthening research and knowledge networks, sharing innovations and best practices that are relevant to health care delivery within Sri Lanka. It is the fervent belief of the Ministry that this journal will be developed to the status of an indexed journal soon.

I indeed appreciate the endeavour of the editorial board and others for addressing a timely need of the health care system and welcome the first issue of the SLJHR. I believe and trust that SLJHR will be guided by the principles of good practice in the management and conduct of health and social research helping to improve the quality of healthcare in Sri Lanka.

S Janaka Sri Chandraguptha

Secretary
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Message from the Additional Secretary (Medical Services)

The Research wing is considered an integral component of a modern health system. A strong health system ensures the presence of an overarching research culture that offers opportunities for health care workers to engage in research.

The Ministry of Health, Sri Lanka is continuously being engaged in shaping the research culture through several formidable measures. The launch of the official journal for the Ministry of Health, “Sri Lanka Journal of Health Research (SLJHR)”, for the first time in its history, is the most recent step taken towards it.

I am proud to be a member of the team pioneered in this strenuous process of launching the inaugural issue of SLJHR from its inception, aimed at creating a sound and sustainable research culture in the Sri Lankan health sector. This journal was envisioned and founded to represent the growing needs in healthcare that promote the usage of evidence-based information to service delivery as well as policymaking. It would also enable sharing innovations and best practices relevant to the health care delivery in Sri Lanka. I believe this journal will have an immense impact on strengthening health service delivery across the country.

I wish to express my appreciation to the Honourable Minister of Health and the Secretary of Health for their encouragement extended throughout the endeavour in making this journal a success. I acknowledge the contribution of the Director General of Health Services and Deputy Director General (Education, Training and Research) in the publication process.

My special thanks go to Dr Ruwan Ferdinando, Consultant Community Physician of the National Institute of Health Sciences, who has been coordinating the activities of the journal, on my behalf, with my Senior Registrars. I offer my gratitude to my dedicated team, Editors in Chief, honorary members of the editorial board, editorial committee, national and international members of the editorial panel, chief statistical advisors, web managers, and editorial assistance team, who worked tirelessly but voluntarily to make this endeavour accomplished. Further, I wish to thank the authors for sharing their manuscripts with SLJHR to make this journal a reality.

Dr Sunil De Alwis

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Message from the Director General of Health Services

It is with great pleasure, I present this message to the inaugural issue of the official journal of the Ministry of Health, Sri Lanka Journal of Health Research (SLJHR). This new journal was envisioned and founded to represent the growing needs of healthcare workers in an increasingly dynamic field. Its mission is to efficiently and promptly publish rigorous, accessible, and relevant material that will help health professionals in Sri Lanka in their practice, lifelong learning, and career development. Though its main focus is research, it will support sharing of health innovations and best practices as well.

The purpose of research is to generate evidence and inform action. Slow translation of research into practice is one problem that often hinders progress in health. Often, a disconnect exists between those who conduct research and those who are positioned to implement the findings of the research. It leads to the communication gap in disseminating the new knowledge generated through research from the researcher to the implementer. The SLJHR is intended to bridge this gap by making a platform for researchers and practitioners to share health system experiences, findings, and solutions, identify new issues and shape future directions for research while exploring applications of novel techniques of high performance.

This scholarly journal is a result of the tireless efforts of many to inculcate the research culture among health workers. I am very thankful to everybody who supported the idea of creating this new journal. I am certain that this very first issue will be followed by many others, reporting new developments in the field of Health Sciences.

Dr Asela Gunawardena

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Message from the Deputy Director General Education, Training and Research

It is with great pleasure and pride that I send this message to the inaugural issue of the official journal of the Ministry of Health, Sri Lanka. Evidence-based practice is of paramount importance to update and upgrade quality health care delivery in a country. Education, Training, and Research Unit of the Ministry of Health (ET&R), the focal point for the development of health research in this country, has long identified the importance of evidence generated through research within health systems, medical practice, and other allied fields.

The ET&R Unit has implemented several mechanisms to encourage research culture in the health sector. The ET&R Unit in collaboration with the National Health Research Council (NHRC) has published the Code of Conduct for Health Research in Sri Lanka (2018) and Health Research Governance Strategy in Sri Lanka (2019). These publications will indeed be useful to improve the standards, quality and governance of health research in Sri Lanka. The ET&R Unit has taken the lead in organizing the National Health Research Symposia in Sri Lanka since 2017 which created a platform to bring together the policymakers, government, preventive and curative health care professionals, academia, inventors, health and non-health sector researchers, development partners and non-governmental organizations with the common goal of sharing research evidence for the betterment of health sector service delivery in Sri Lanka.

It is of great importance not to limit showcasing research evidence through abstracts, but also to develop as full-text manuscripts in peer-reviewed indexed journals in view of increasing visibility and enhancing the utilisation of research evidence by a wider audience. Therefore, I am delighted for the efforts of introducing an official journal for the Ministry of Health that provides a valuable platform for full-text publications in health research which will encourage researchers to showcase their research beyond a conference abstract. This effort will surely be recognised in global forums as an exemplary practice for a Ministry of Health to introduce an official journal for health research publications.

With great enthusiasm and anticipation, I invite you all to read the first-ever peer-reviewed official journal of the Ministry of Health, Sri Lanka.

Dr H D B Herath

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One Team, One Heartbeat for One Goal

AUTHOR: UNKNOWN



Provision of health care involves health professionals from various disciplines working together, communicating often, and sharing knowledge where the multi-disciplinary team approach is of paramount importance to achieve care goals that are unlikely to be achieved by health professionals acting in isolation. This viewpoint has enlightened the medical field that quality patient care is accomplished only through grasping knowledge from diverse disciplines. Having a common goal will cultivate unity and boost the productivity among the members of diverse health staff categories paving the way to reach the highest attainable health of the catering population.

Sri Lanka is hailed by other countries as a model for taking healthcare to the doorsteps of people, producing impactful results at a low health expenditure. The motherland can be proud of its health manpower deployed at the grass root levels, who works for the betterment of lives, especially of poor rural masses. Our health workforce is well trained, skilled, and well recognised for their good performances even globally, however, the fact remains that greater investment in

the health workforce is needed to face emerging health challenges.

The Sri Lanka Journal of Health Research (SLJHR) is a common platform for publishing quality health research undertaken by different categories in the health workforce. The mission of SLJHR is to efficiently and promptly publish rigorous, accessible, and relevant material that will help health professionals of Sri Lanka in their practice, lifelong learning, and career development. The logo of SLJHR depicts the field of medicine and healthcare by the centrally placed Rod of Asclepius, the new knowledge and professional growth by the books, and the unity and solidarity among different categories of health professionals by the differently coloured symbolic people who are binding together.

The SLJHR is intended to encourage the culture of research and evidence-based practice among all health professionals and to provide a commonplace for the healthcare fraternity to unite as one team with one heartbeat for the common goal of uplifting the health of the nation.

A thriving health system with an evidence-based culture: The potential catalytic role of Sri Lanka Journal of Health Research (SLJHR)

Sunil De Alwis, Sudath Samaraweera, Ruwan Ferdinando

Editors in Chief, Sri Lanka Journal of Health Research

Over the last few decades, there have been very few low- or middle-income countries in the world that have simultaneously achieved strong health outcomes, good financial protection by low cost and Sri Lanka stands tall amongst them [1]. Moreover, the Sri Lankan health system was well in line with achieving the Sustainable Development Goals prior to the COVID-19 pandemic. At a time of combating the COVID-19 crisis on many fronts, the country often witnessed a concerted effort from the health sector to maintain its current achievements while improving the quality of the existing health services. The launching of the Sri Lanka Journal of Health Research is one such endeavor.

Healthcare is a large, complex and adaptive system. Health systems are inherently dynamic, constantly facing new challenges. When developing interventions to address these challenges, it is often witnessed that ad-hoc, non-scientific mechanisms will not be sustainable. While interventions based on non-scientific phenomena may get wide publicity in short term, as evident by the recent events too, what last long are those based on scientific rationale.

There can be many definitions for science according to different philosophies. However, in real life, it can be considered to be the embodiment of the most reliable knowledge about the world humankind has hitherto acquired [2]. Science requires exercising critical intelligence on the best available evidence generated by a systematic method. Evidence-based scientific practices are regarded as the cornerstone for the success of any progressive health system.

The three elements of these evidence-based practices include integration of best available evidence, clinical experiences and the perspectives of the clients. The “best available evidence”, synthesized both globally as well as locally, paves the way for addressing health challenges, as discussed above.

Transforming scientific evidence for its use in practice, commonly known as research translation, involves many processes and strategies [3]. Dissemination, health communication and implementation are some such processes. Dissemination of evidence generated in the field of health, especially set about by the Ministry of Health, in the form of a journal, has been a long felt need. Sri Lanka Journal of Health Research (SLJHR) intends to fulfil this need. It is the official journal of the Ministry of Health, representing all categories of its staff. Such a journal could create a common platform by being open for all health staff categories island-wide and even beyond. The SLJHR was designed to fulfil the key mission of efficiently and promptly publishing rigorous, accessible, and relevant material that will help health professionals in Sri Lanka in their practice, lifelong learning, and career development. The editorial board wishes the SLJHR to be guided by the best possible standards and norms in the world and to achieve the status of an indexed journal in due course.

The SLJHR has come into the existence following a series of stakeholder meetings and discussions. The SLJHR is proud to have an editorial committee and an editorial panel representing a cross-

section of the categories of healthcare staff in the country and abroad. We sincerely thank all of them for their unstinted contributions. A special thank is due to the authors and the others who have supported in making this a reality. To ensure accessibility across all the staff categories and the quality outputs, this will remain an open-access peer-reviewed journal.

We sincerely hope that SLJHR will thus play a catalytic role in dissemination of scientific evidence within and beyond Sri Lanka. As the editors in chief, we warmly invite you to submit manuscripts to the SLJHR. We are looking forward to completing a quick and comprehensive review process in the future, thus doing justice to each article you submit.

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'This is how we did it', the strong voice of resilient people: A paradigm shift for risk communication during fatigue phase of COVID-19 pandemic

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Almost twenty-four months have passed since the first patient of COVID-19 was reported. COVID-19 is no more felt like a novel, unfamiliar, acute health threat by the public. In the current context of COVID-19, it is not only a health crisis but also a major socio-economic and information crisis. Pandemic and its response are pushing the world to a major global recession. Although public health measures remain the best way to minimize the spread of the virus, people are becoming less adherent to these measures. Pandemic fatigue impacts people, making them complacent and less receptive to risk perception; along with less interest, less trust, and less confidence in their role to control the virus. Therefore, creative and engaging ways to motivate people need to be identified for the local context and implemented to overcome challenges in risk communication and community engagement (RCCE) at this juncture.

People understand according to their experience and often display 'herd behaviour'. Thus, risk communication must be contextual and should engage the right people and influencers for the relevant community. Health and socioeconomic resilience are equally important to combat the pandemic. The RCCE efforts should be prioritized to reach both medically and socioeconomically vulnerable groups and enable them. Therefore, community-led communication, sharing their success stories during the pandemic was utilised as a novel approach for risk communication in Sri Lanka at the beginning of 2021.

The project was conducted by the Disaster Preparedness and Response Division (DPRD) to identify and publicize 'Champions' among the general public who restarted/continued their economic activities successfully adapting to new normalcy through

innovative approaches and public health measures. Triangulation of methods was used to identify people and occupational settings that have well adapted to new normalcy to combat COVID-19. Mainly they were randomly selected by observing different occupational settings and conducting in-depth interviews with a range of employees from a wide range of socio-economic backgrounds across the society from various parts of the country. In addition, selection of occupational settings was done through nominations from grass-root level health workers and through self-nomination, calling to a dedicated telephone number at DPRD publicized through a media channel. However, these places were visited by a team of three experts representing relevant locality, DPRD, and the media station before finalizing as a 'Champion' of new normalcy to share their success stories with the public through mass media. The occupational settings and employees identified as 'not adapted to new normalcy through public health measures' while conducting random observations were guided on adapting to new normalcy through public health measures. The process was conducted with the informed consent of individuals and organizations.

A news segment was designed and telecasted regularly over three months in partnership with Sri Lanka Rupavahini Cooperation (SLRC) to introduce the 'champions of new normalcy'. A range of role model occupational settings and individuals who successfully continued their economic activities using innovative approaches, well adapting to new normalcy were introduced; including a labourer, grocery shop, garment factory, bakery, three-wheeler driver, pharmacy, builder, art academy, garage, Zumba class, textile shop, bookshop, restaurant, batik factory, salon, aquarium, veterinary service, plant nursery, fish seller, mason,

IT company, along with their life style changes. This was an opportunity given to people to share their real experience of 'successful change' and its benefits with the public. This was a community-led, multi-sectoral coordinated effort using an innovative communication approach to combat COVID-19 while safeguarding the economy of the country. The news segment was published as 'Rise again 2021- move forward with confidence' ('Yali Nagitimu 2021, Vishvasayen Perata'). The news segment commenced on 27th December 2020 and continued for more than three

months regularly. Two minutes of prime-time news in SLRC was dedicated for this segment. The news segment was marketed as a new year's gift for 2021 from DPRD and SLRC to the Sri Lankans. The message was well-received by the public and the participants were identified as heroes within their community. The feedback from the participants confirmed an increase in their customer base after the programme and was accepted as a healthy setting by the community.

The proposed model for innovative, motivational communication approach involving resilient people during the pandemic as 'change agents', can be identified as one of the best practices of RCCE in Sri Lanka shifting the communication strategies, from one-way communication at the initial stages of the pandemic towards the community engagement and participatory approaches during the pandemic fatigue stage. It well addresses the overarching goal of the global RCCE strategy of people-centred, community-led approaches resulting in increased trust, social cohesion, and ultimately a reduction in the negative impacts of COVID-19.



Author declaration

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Author contributions: PDR designed and developed the concept, conducted the selection process, codirected the news segment with the news crew of SLRC, and developed the manuscript. HDBH provided guidance and overall support to the project and revised the manuscript.

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Patient-centred interviewing in Outpatient Departments: A doctor-client perspective

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Abstract

Background: The medical interview is the most common undertaking by a physician. On average, a doctor performs over 200,000 interviews during his career. The traditional medical interview was centred on the clinician. In the late 1970s, the bio-psychosocial model was first introduced by Engel and followed by McWhinneys' as patient-centred approaches which were swiftly adopted into practice by clinicians. However, in Sri Lanka, no clear evidence could be found to suggest that patient-centredness in the medical interview was given much emphasis in the past. Research evidence available from the local setting on this field is limited. Against this backdrop, it is imperative to assess the perceptions of patient-centred interviewing among the doctors as well as patients.

Objective: To assess the doctor and patient perceptions on patient-centred interviewing in Outpatient Departments (OPD) consultations.

Methods: A descriptive cross-sectional study was conducted in OPDs of government hospitals in the Colombo Regional Director of Health Services division. All doctors and a sample of patients over the age of 18 years were included. Data collection was done through a self-administered questionnaire and focus group discussions. Data analysis was done by using MS Excel and framework thematic analysis.

Results: Both doctors and patients perceived the short consultation time as a leading challenge to have patient-centred interviews in OPDs. In addition, interviewers being disrespectful to patients, providing inadequate information, not getting the involvement of the patient in decision making, and having poor listening skills were negatively perceived by the patients. Overcrowding, heavy workload, stressful work conditions, lack of privacy, and low priority given by the hospital management to OPD functions were perceived by the doctors as barriers to improve the patient-centred interviews. Even though the majority of the doctors have already undergone communication skills training, their willingness to learn and improve these skills was noted.

Conclusions and Recommendations: As perceived by the partakers, the patient-centred interviewing in the OPDs has multiple challenges. Placing more emphasis on organizing communication skills training, ensuring longer consultations, providing a more responsive working environment for the doctors, ensuring privacy and confidentiality of transpired information, reformulating OPD functions are recommended.

Keywords: Patient-centred interviewing, Outpatient Department, doctor-patient relationship

Background

The medical interview is the most common undertaking by a physician. On average, a doctor performs over 200,000 interviews during his career. Despite many advances in modern medicine, medical consultation remains the most valuable diagnostic tool, surpassing the combined worth of both medical examination and laboratory investigations [1].

The traditional medical interview was centred on the clinician. It consisted of structured, predominantly closed-ended questions with the primary objective of arriving at a diagnosis. This often resulted in incomplete and flawed information and led to a less than satisfactory relationship between the doctor and the patient [2]. This form of the interview was based on a biomedical model and left no room for exploring social, psychological, and behavioural dimensions of an illness [3].

In the late 1970s, the bio-psychosocial model was first introduced by Engel [3]. This was followed by McWhinney's patient-centred approaches which were swiftly adopted into practice by clinicians [4]. This model allowed doctors to recognise patients' values, needs, and preferences and permitted patients to participate actively in the decision-making process. Today, patient-centred interviewing (PCI) is recognised widely as the central element of high-quality health care [5].

The PCI has four domains: patient's perspective, psychosocial context, shared understanding and sharing power and responsibility [5]. Effective PCI entails mastering a set of skills by the doctor to practice during consultations: eliciting the patient's agenda with open-ended questions; encouraging the patient to express his/her opinions uninterrupted; engaging in active listening; understanding the patient's perspective of the illness; exploring the patient's feelings, ideas and concerns; expressing empathy by demonstrating respect, support; exploring the patient's illness experience and emotions; shared decision making and providing information. These are the key components that construct a patient-centred consultation [6]. Advantages of PCI over earlier models include enhanced patient satisfaction, increased compliance with treatment, higher client satisfaction, lesser chance of legal actions against caregivers and in general improved patient outcomes [7].

In Sri Lanka, no clear evidence could be found to suggest that patient-centredness in the medical interview was given much emphasis in the past.

Research evidence available from local settings in this field is also limited [8]. However, it may be safe to assume that the cultural and social norms and lack of awareness may have led to the misconception that the status quo was acceptable and no intervention was required. Against this backdrop, it is imperative to assess the perceptions of PCI among the doctors as well as among the patients.

Objectives

This study was undertaken with the objectives of assessing doctors' perceptions on the importance of learning, the importance of practising and the actual practice of patient-centred interviewing skills in Outpatient Departments, and the clients' perception of doctors' practice of patient-centred interviewing skills.

Methods

A descriptive cross-sectional study was conducted in two phases, viz; questionnaire-based survey and Focus Group Discussions (FGD). The questionnaire-based survey was conducted at the Outpatient Departments (OPDs) of all eleven government hospitals in the Colombo RDHS division (two Base Hospitals and nine Divisional Hospitals). All medical officers and registered medical officers working in the OPDs ($n = 101$) and patients over the age of 18 years, coming for OPD treatment during the study period were included (Exclusion criteria; critically ill or psychologically unsound patients). The study was conducted from June to September 2015.

A sample of 422 patients was allocated to the hospitals proportionate to the number of patients attending the OPDs in the previous year. At each hospital, convenience sampling was used to select the participants. Data were collected using interviewer and self-administered questionnaires for the patients and doctors respectively. Selection of specific variables and development of questionnaires were carried out following an extensive online literature review and discussions with experts in the field of study including senior medical officers, Community Physicians, Medical Administrators, and university academics. Two FGDs were conducted with doctors and patients to identify barriers and means to overcome them. The self-administered questionnaire for doctors consisted of two main components: socio-demographic data and an assessment of doctors' perception on the importance of learning and practising patient-centred interviewing skills and assessment of the doctors' perception of

their practice of PCI skills in OPD consultations. The interviewer-administered questionnaire for patients consisted of socio-demographic data and an assessment of patients' perception of doctors' practice of PCI skills in OPD consultations.

Two FGDs were conducted using an FGD guide. The first group was patients and the second was doctors. For the first group, participants were selected based on their age, gender, and occupation, and the second based on their gender and category (Medical Officer/Registered Medical Officer). Discussions were conducted by a facilitator using a semi-structured FGD guide. The principal investigator participated as an observer. All discussions were electronically recorded and transcribed. Thematic analysis was done.

Administrative clearance was obtained from the Provincial Director of Health Services, Western Province and the RDHS, Colombo District, and from the relevant heads of institutions, before undertaking the study. Ethical clearance was obtained from the Ethics Review Committee of the Postgraduate Institute of Medicine.

Results

Socio-demographic characteristics of OPD doctors and the patients

As shown in Table 1, the majority of doctors (78.7%, $n = 63$) were above the age of 45 years. Age ranged from 27 to 59 with a mean of 49.28 ($SD = 7.46$). Females (70.9%, $n = 61$) formed the majority.

Total work experience as a doctor ranged from 1 to 33 years with a mean of 21.28 ($SD = 8.15$). The majority (67.4%, $n = 58$) had 20 years or more of service experience. Duration of the service in the OPD ranged from six months to 33 years with a mean of 16.65 ($SD = 10.78$). The majority (57.0%, $n = 49$) had over 20-year service in the OPD. Medical Officers and Registered Medical Officers are the two categories of doctors working in OPDs and both of these groups were equally represented in the current study. The majority (54.7%, $n = 47$) of the doctors had prior training in communication skills. Out of them, 70.2% ($n = 33$) had received this training as a part of their in-service training and the others received it during their undergraduate training or postgraduate training. The majority of the doctors in the sample (68.91%, $n = 51$) had postgraduate training.

The majority of the patients in the sample (64.1%, $n = 262$) belonged to the age group of 18–40

years. Minimum and maximum ages were 18 and 69 years respectively. Males (53.1%, $n = 223$), Sinhalese (93.6%, $n = 394$), and Buddhists (90.8%, $n = 383$) made up the majority. Over two-thirds of the patients had faced GCE A/L (39.1%, $n = 164$).

Doctors' perception of their interviewing skills and the value of learning interviewing skills

The majority of the doctors in the sample (88.3%, $n = 77$) perceived that their communication skills as good, very good, or excellent. None of the doctors believed their communication is at a poor level. Only nine doctors (11.7%) rated it at a fair level. All the doctors agreed with the statement "in order to become a good doctor I must learn good interviewing skills". However, 14.3% ($n = 12$) of the respondents believed that learning interviewing skills is a 'waste of time'.

Doctors' perception of the importance of practising patient-centred interviewing skills

As illustrated in Figure 1, the overwhelming majority responded positively either agreeing or strongly agreeing with all seven statements which assessed the importance of practising patient-centred interviewing skills.

Doctors' perception of their practice of patient-centred interviewing skills and the clients' perception of the doctors' practice

As to the perception of the doctors, the majority of the doctors were practising PCI at the OPD. However, getting the involvement of the patient in decision making and educating them were very poorly practised aspects in patient-centred interviewing. As percentages, 40.5% ($n = 34$) of the doctors had not got the involvement of the patients adequately in decision making and 23.3% ($n = 20$) had not educated the patients sufficiently. The majority (52.50%, $n = 220$) of the patients had stated that the doctors rarely educated them. Nearly half of them (47.50%, $n = 200$) had claimed that they were not involved in decision making and the decision making was done by the doctor. As demonstrated in Figure 2, for all the domains tested in the study, the doctors rated their practice as at a higher level than the ratings given by the patients.

Focus Group Discussions

The FGDs were used to explore further, the perception of both the doctors and patients on PCI

in the OPDs. For the first discussion, ten patients including four males and six females had participated. There was a retired school teacher, lawyer, mechanic, two self-employed males, and four housewives. Three participants were under 30 years and three were above 60.

Analysis of the discussion yielded several themes. One repeatedly mentioned theme was, the short consultation time which limited the opportunity to explain the illness, expressing feelings, and asking questions to clarify matters. However, the majority had felt that the doctors themselves were also helpless in this regard. The patients had felt the short consultation time was due to the overcrowding and the doctors had given their priority to finish work. There were some experiences of doctors writing the prescriptions even before the patient presented his/her problem completely.

However, when questioned further, it emerged a deeper dissatisfaction in them. The question 'Are doctors ever rude to the patients?' stimulated an emotional response from a patient. According to her, very few doctors were indeed rude and unkind. Further, they did not even look at the patient's face throughout the interview, instead took notes while the patient presented the problem. Some even got angry with the patients without having any apparent reason. A few of them demonstrated unresponsiveness, chatting with other staff members and using mobile phones during the interview. In general, most of the participants expressed their dissatisfaction regarding the amount of information given by the doctors while highlighting the time factor. However, participants felt that a little more time could have been spent explaining the illness and the treatment which will benefit them. Yet, when doctors took time to explain, patients were generally able to understand what doctors said.

Physical arrangements of the OPDs were figured out in the conversation when discussed regarding the privacy and confidentiality of the patient. During the consultation, two or more doctors shared one cubicle and many patients stood outside the door waiting for their turn. The conversations could be overheard by all of these people and privacy was non-existent.

Eleven doctors participated in the second FGD, including a Consultant Family Physician, four Medical Officers, and six Registered Medical Officers. The most shared concern was the shortage of doctors. 'Clearing the OPD' had become the priority and the resultant short consultations were perceived as the foremost

obstacle to a patient-centred consultation. At the same time, doctors who engaged in longer consultations were treated negatively by both the waiting crowd and also by the other doctors. The pressure to choose quantity over quality coupled with inflexible working hours, heavy workload and family commitments put severe mental stress on a doctor, and it adds a negative demeanour to how they treated their patients. Nevertheless, discontent about the existing situation was not evident in the group. Doctors were of the view that, even in a short consultation, they listened to the patient's concerns, empathized with their grievances, involved them in decision making to an appropriate level, and had given adequate information in a manner that the patient could understand.

Difficulties in ensuring privacy and confidentiality also came under the consideration of the FGD. Lack of space and disorganized OPD functions were identified as contributing factors. In addition, doctors were unsatisfied with the level of commitment of administrators towards the day-to-day functioning of the OPD. They felt that the management gives a low level of attention to the OPD, allocating inefficient minor staff and unequally distributing physical resources such as space, equipment, and even stationary.

The commitment and willingness of the doctors to improve the patient-centred consultation were emphasized in the FGD. All participants agreed that there is room for improvement and they are ready to make the effort. Communication skills training was considered an essential requirement by the doctors; however, the shortage of opportunities to get this training was resounded over and over.

Discussion

Silverman and Rosenbaum have stated that the fast-developing field of health care communication could be seen as a Western trend and that it may only be suitable to a particular cultural setting [9]. Research done in this area relevant to the local setting are limited [8].

The findings of the questionnaire-based survey revealed that the majority of the doctors had not undergone communications skills training, but doctors agreed on the value of learning and practising patient-centred communication. When asked to rate their communication skill level, the majority of them perceived it as good, very good, or excellent. This is compatible with other global studies conducted in

settings where patient-centred communication was given high priority and recognised as a learning interest [10,11].

However, when a comparison was made between the doctors' and patients' perceptions of doctors' practice, patients gave lower ratings for all dimensions. According to Silverman and Rosenbaum, communication is a clinical skill that could be taught and learned. However, they observed a gap in knowledge transfer from classroom to work setting. They also indicated that experience alone cannot make doctors good communicators [9].

The two FGDs were conducted to explore these findings deeper. The first and foremost issue highlighted by both parties was the inadequate time allocation for a consultation. Many works in the literature support this fact. A report published by the British Medical Association highlighted the time constraint as the main barrier for effective communication [12]. Wiggers and Fisher went further by stating that the time duration of the consultation is a determinant of quality of care [13].

However, the time limitation was not the sole pivotal factor. Statements such as "even when I'm telling my problems, the doctor sometimes engage in a conversation with others" or "at times he/she engages in telephone conversations" and "Some doctors treat patients unkindly, talk to them rudely, get angry when we try to tell them our problems" were demonstrated a deeply rooted problem. Not showing adequate attention to patients' emotional needs, providing inadequate information, and not involving patients in decision-making were also emphasized in both segments of the study. Even though these accusations were half-heartedly accepted by doctors, they had their justifications, leaving with a lack of time, heavy workload, emotional stress, and lack of support from the management.

Another striking yet contrasting feature observed in the FGD was the reluctance of the patients to complain openly against the doctors. Even though people expressed their dissatisfaction many of them agreed that they would not be willing to make complaints. The reasons included; "There would be no point of doing it", "Not all doctors are bad", "Doctors also have problems", and "Patients are also to blame sometimes". This line of thinking may stem from the hierarchical nature of Asian health systems which put doctors at a higher level of power [8].

Overall the study showed evidence of a system in which the two parties to the medical consultation perceive the practice of patient-centred skills by doctors in a different light and a system that requires further examination and urgent interventions for improvement. One key solution was training. Silverman identified communication as a clinical skill, which can be taught and learned [9]. However, during the FGD, while agreeing with the importance of learning communication skills, the lack of learning opportunities was mentioned by the doctors as a limiting factor. Many health systems around the globe struggle to provide adequate communication training opportunities for doctors [14]. Hence, Sri Lanka is not alone; however, a remedy is needed.

The study may have a few limitations. Respondents may have been tempted to give socially favourable answers to the questionnaires which are not accurate in real practice. Hence, instead of assessing the perceived quality of practice using questionnaires, observation of the actual consultations using checklists would have given a more accurate insight. Coupling/ pairing of doctors and patients would have given a more accurate comparison of the perception of the practice. Only two FGDs were conducted due to time constraints.

Conclusion and Recommendations

The study demonstrated that the PCI in OPDs, when perceived through the eyes of two partakers had many attributes including challenges brought on by short consultation time, the inadequate practice of skills by doctors, especially when providing information, and mutual decision making. Most of the identified reasons for a poor level of patient-centred communication are the responsibilities of the hospital management. The issues identified were overcrowding, heavy workload, privacy and confidentiality, poor level of maintenance and facilitating that can only be solved by the hospital management. To overcome these shortcomings, a careful study and an effective work plan should be identified as a collaborative effort of doctors and hospital management. Interviewers' willingness to learn and improve their skills can be taken as an opportunity to introduce some training programmes to enhance the communication skills of the doctors. The patients also need to be equipped with their rights and a well-established complaint system needs to be introduced in the OPD.

Author declaration

Author contributions: Study concept, designing, data collection, analysis and interpretation of results, draft and final manuscripts preparation were done by APS. The supervision and guidance of all steps of the project were done by NSRH Both authors read and approved the final manuscript.

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Table 1: Characteristics of OPD doctors

Characteristic		Frequency	Percentage
Age (in years) (n = 80)	≤ 40	11	13.8
	41–45	6	7.5
	46–50	19	23.7
	51–55	34	42.5
	56–60	10	12.5
Sex (n=86)	Male	25	29.1
	Female	61	70.9
Work experience as a doctor (years) (n=86)	< 20 years	58	67.4
	≥ 20 years	28	32.6
Work experience as an OPD doctor (years) (n=86)	< 20 years	49	57.0
	≥ 20 years	37	43.0
Designation (n=82)	Medical Officer	41	50.0
	Registered Medical Officer	41	50.0
Postgraduate training (n=74)	With training	51	68.9
	Without training	23	31.1
Previous training on communication skills (n=86)	Had training	47	54.7
	No training	39	45.3

Table 2: Socio-demographic characteristics of the patients

Characteristic		Frequency	Percentage
Age (in years) (n = 409)	≤ 30	158	38.6
	31–40	104	25.4
	41–50	70	17.1
	51–60	43	10.5
	Over 60	34	8.3
Sex (n = 420)	Male	223	53.1
	Female	197	46.9
Ethnicity (n = 420)	Sinhala	394	93.8
	Tamil	09	2.1
	Moor	16	3.8
	Others	2	0.4
Religion (n = 422)	Buddhism	383	90.8
	Christian/Roman Catholic	13	3.1
	Hindu	12	2.8
	Islam	14	3.3
Educational level (n = 419)	No formal schooling	6	1.4
	Year 1–Year 5	36	8.6
	Year 6–Year 10	81	19.3
	GCE (O/L)	132	31.5
	GCE (A/L)	135	32.2
	Beyond GCE (A/L)	29	6.9

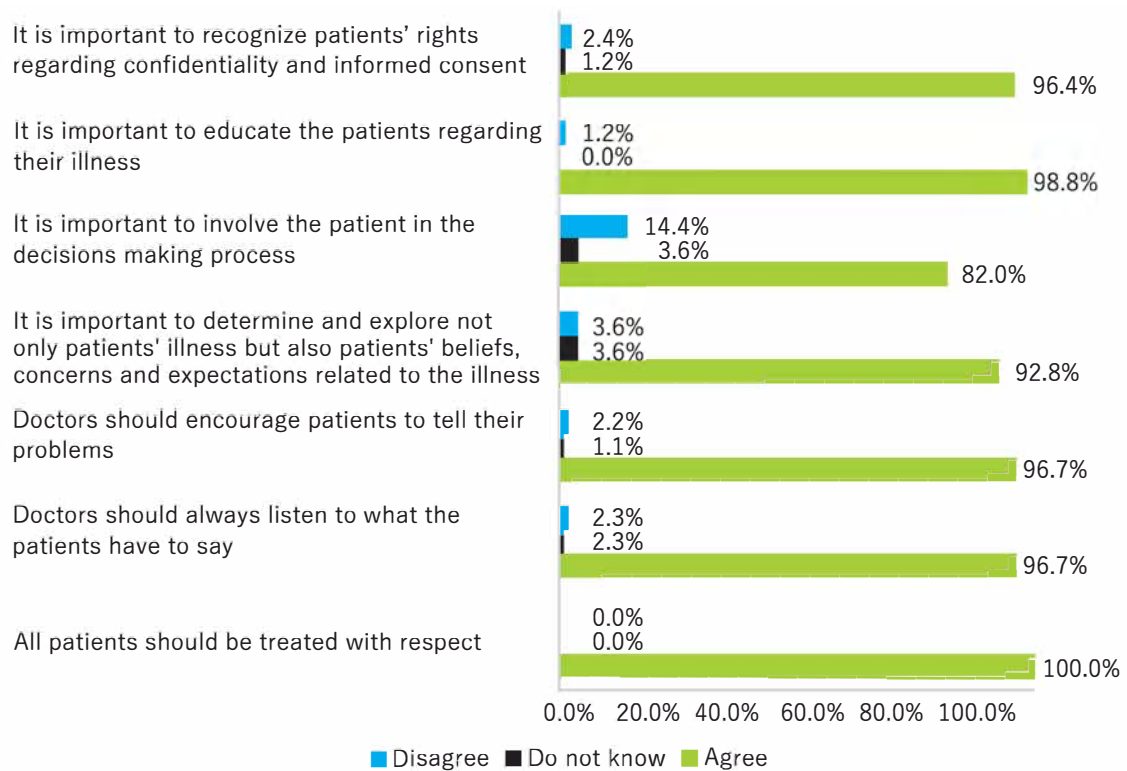


Figure 1: Doctors' perception on the importance of practising patient-centred interviewing skills

Responses strongly agree and agree were amalgamated as 'Agree' and responses disagree and strongly disagree were amalgamated as 'disagree'.

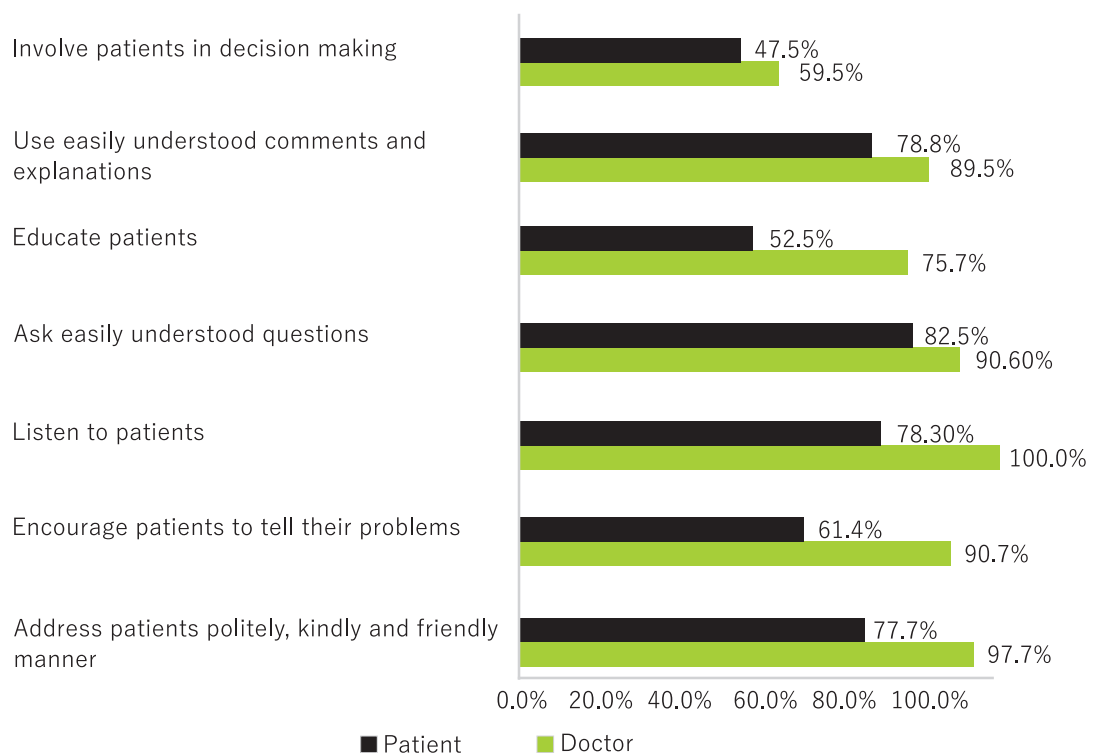


Figure 2: Doctors' perception of their practice of patient-centered interviewing skills and the clients' perception of the doctors' practice

The percentages depict the ones who have given the responses 'always' and 'often'. The other responses, 'sometimes', 'rarely', and 'never' represent the complementary percentage in each statement.

Comparative analysis of cultural competence of senior and junior nursing students

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Abstract

Background: Cultural competence (CC) is essential for nurses because cultural diversity challenges health care providers, especially nurses, to provide culturally competent care to diverse populations. Cultural competence training in nursing education is a timely need in Sri Lanka and worldwide.

Objective: The purpose of this study is to compare the level of cultural competence between senior and junior student nurses studying in the School of Nursing at Kurunegala and Vavuniya to identify how current nursing education influences CC improvement.

Methods: A comparative descriptive cross-sectional study was conducted in Schools of Nursing, Vavuniya and Kurunegala, Sri Lanka. A systematic random sampling technique was used to select participants from first and third-year nursing students. Data were collected by a validated self-administered questionnaire and analysed using Statistical Packages for Social Sciences (SPSS) version 22. Ethical approval was obtained from the Ethics Review Committee of the Faculty of Medicine, Colombo, Sri Lanka.

Results: The mean score of junior student nurses' CC was 3.72 (SD±0.38). The mean scores of cultural awareness, cultural knowledge, cultural skills, cultural encounter, and cultural desire of junior student nurses were 3.80 (±0.37), 3.55 (±0.54), 3.48 (±0.71), 3.54 (±0.56) and 4.26 (±0.46), respectively. The mean score of CC of senior student nurses was 3.92 (SD±0.28), and the mean scores of cultural awareness, cultural knowledge, cultural skill, cultural encounter, and cultural desire were 3.94(±0.35), 4.00 (±0.38), 3.77 (±0.50), 3.63 (±0.44), and 4.29 (±0.49), respectively. Independent sample t-test indicated no significant difference between the senior and junior student nurses when compared to CC (p = 0.697).

Conclusion: The CC was at a moderate level for both junior and senior students and there is an essential need to increase it to the highest level possible due to the cultural diversity of the patients that they have to provide healthcare in Sri Lanka.

Keywords: Junior student nurse, Senior student nurse, Cultural competence

Background

Cultural diversity is increasing globally, and it is a challenge for health care providers, especially nurses, to provide competent care to diverse populations. Nursing care should be individualised and based on the cultural, racial, and ethnic diversity of patients and their families [1]. According to historical evidence, the concept of cultural competence in the nursing profession could be drawn from the 19th century in the days of Florence Nightingale, who developed a

growing concern for cultural needs in healthcare system delivery. This was evident when English nurses carried out health delivery services in India in the 1950s. They absorbed the cultural lifestyle of the Indian patients, resulting in the introduction of a transcultural nursing system as a major area of study for the practice of nursing by providing culturally appropriate care and love for their patients [2].

Cultural competence starts with the knowledge of understanding other people's cultural practices and

the acceptance that their culture cannot be shared. There were common elements in all theories about cultural competence, but the definitions of cultural competence vary. According to Leininger, Cultural competence was defined as “a legitimate and formal area of study, research, and practice, focused on culturally-based care, values, and practices to help cultures or subcultures maintain or regain their health and face disabilities or death in culturally congruent and beneficial caring ways” [3, p.32]. Purnell defined that “cultural competence can be attained when individuals develop an awareness of their existence, including their sensations, thoughts, and environment. Besides, cultural competence requires health care providers to demonstrate an understanding of the culture of the client and respect for differences in culture” [4, p.8]. Campinha-Bacote defined cultural competence as “the process in which the healthcare professional continually strives to achieve the ability and availability to effectively work within the cultural context of a client (individual, family, or community) and the constructs of cultural competence are cultural awareness, cultural knowledge, cultural skill, cultural encounter, and cultural desire” [5, p. 181].

Previous studies have demonstrated that a lack of CC contributes to health disparities, poor health outcomes, cultural conflicts, and non-compliance [6]. Therefore, this deficiency in cultural competence creates a gap between the nurse and patient-centred safe care and creates a challenge to caring for diverse populations. Hence, nursing educators have a great responsibility to prepare nurses skilled at cultural competence. Nursing students are continuously evaluated on clinical skills and knowledge, but assessments of their cultural competence are lacking. Thus, there is an essential need to identify the level of cultural competence among nurses because it is a component of quality practice that leads to improving health outcomes for patients, families, nurses, and the health care system.

Studies revealed that most nurses had moderate cultural competence in different countries [7-9]. In Sri Lanka, Senarathne [10] revealed the same findings that student nurses in the final year had a moderate level of cultural competence. As a result, the researchers suggested that more studies need to be conducted to determine how the current nursing education system helps to improve the cultural competence of the student

nurses by comparing the cultural competence of junior students who had no education in cultural competence and clinical experience with diverse patients to senior students who had education in cultural competence and clinical experience with diverse patients.

Objective

This study aims to compare the cultural competence level of senior and junior student nurses in the Schools of Nursing at Kurunegala and Vavuniya.

Methods

A comparative descriptive cross-sectional design was undertaken. All third-year (senior) and first-year (junior) student nurses in the School of Nursing in Kurunegala and Vavuniya represented the study population. A systematic random sampling technique was employed for this study. Every third person was chosen from the student registers ($750/300 = 2.5$) in each batch and each nursing school. The sample size was 255, according to Rao soft online sample calculator [11]. Therefore, 150 participants from the first year and 150 participants from the third year were recruited proportionately from both schools for the study, with an allowance for anticipated nonresponses. Male and female nursing students in their third year and first year were included in the sample. The students who were sick during the study were excluded.

A pretested self-administered questionnaire was used to collect data. It was developed by the researcher based on previous studies [11, 13-16] and mainly according to the five constructs of the Campinha Bacote Model viz. cultural awareness, cultural knowledge, cultural skills, cultural encounter, and cultural desire [12]. Face validity and criterion validity were assessed by experts in the subject matter. Reliability was confirmed by Cronbach's alpha (0.9). The questionnaire includes two parts: Part A—sociodemographic data, Part B—questions to recognise cultural competence. This part B consists of 42 items and rates the five constructs of the Campinha Bacote Model. A point value is assigned to each response. For instance, strongly agree—5 points, agree—4 points neutral—3 points, disagree—2 points and strongly disagree—1 point were given. Once the value of a student's responses has been determined, the level of cultural competence can be determined. Cultural competence value is the mean value of the scores given for part B. The following are the values for each level

of cultural competence and higher scores depict a high level of cultural competence: 1–1.99 Poor competence level; 2–2.99 Mild competence level; 3–3.99 Moderate competence level; and 4–5 High competence level.

The questionnaire was developed in English and translated into Sinhala and Tamil languages. Descriptive and comparative statistical analysis was done using SPSS version 22. Informed written consent was obtained from the students before data collection, and voluntary participation in the study was ensured. Ethical clearance was obtained from the Ethics Review Committee of the Faculty of Medicine, Colombo, and relevant permission from the Schools of Nursing in Kurunegala and Vavuniya.

Results

One hundred and fifty junior students and 150 senior students responded, yielding an overall 100% response rate.

Demographic data

Table 1 summarises the sociodemographic details. The majority of the participants were females in both junior and senior student nursing batches. Most participants were in the 20-22 year age group in the junior batch (53.3%), whereas most of the participants were in the 23-25 year age group in the senior batch (88.7%).

The junior batch included 88.7% Sinhala, 10.6% Tamil, and 0.7% Muslims. Similarly, the senior batch included 84.6% Sinhala, 12.7% Tamil, and 2.7% Muslims. Most participants identified themselves as Buddhists (81.4% of senior students and 85.3% of junior students) in both batches; Christians, Catholics, Hindus, and Islam participants were few in both batches. Most participants were comfortable only with the Sinhala language to communicate with the clients (junior-48.6%; senior-42.7%). However, a considerable number of participants could communicate in Sinhala and English (junior-38.7%; senior-40%) while a lesser number of participants could communicate in Sinhala, Tamil, and English (junior-2%; senior-5.3%) (Table 1). All participants in the senior and junior batches (n = 300, 100%) agreed that they met Sinhala, Tamil, Muslim, and Burgher clients in their clinical practice.

Comparison of cultural competence of junior and senior student nurses

The mean score of cultural awareness, cultural knowledge, cultural skills, cultural encounter, and cultural desire among junior student nurses was 3.80 (± 0.37), 3.55 (± 0.54), 3.48 (± 0.71), 3.54 (± 0.56), and 4.26 (± 0.46) respectively. The mean score of cultural competence of junior student nurses was 3.72 (± 0.38). In the senior batch, the mean scores of cultural awareness, cultural knowledge, cultural skills, cultural encounter, and cultural desire were 3.94 (± 0.35), 4.00 (± 0.38), 3.77 (± 0.50), 3.63 (± 0.44), and 4.29 (± 0.49) respectively. The mean score of cultural competence of senior student nurses was 3.92 (± 0.28). Table 2 compares the mean competence level of subscales and the overall mean of cultural competence of junior and senior student nurses. The independent samples T-test analysis showed cultural competence has no significant relationship with the learning year (senior or junior) ($p = 0.697$).

Discussion

This descriptive comparative study was conducted to compare the cultural competence levels of senior and junior student nurses studying in the Schools of Nursing in Kurunegala and Vavuniya. In contrast to Gwanmesia [8] and Reyes [17], who showed a significantly higher level of cultural competence among senior students/graduate nurses than the junior students/graduate nurses who began their career, this study revealed that there is no significant difference in cultural competence between senior and junior student nurses. Furthermore, both groups have a moderate level of cultural competence. Therefore, it is necessary to determine the underlying cause of a moderate level of cultural competence to address it.

Junior student nurses may not have a proper education and practice in cultural competence as needful to the healthcare sector because they are still in the first semester of the Diploma in Nursing course. On the other hand, senior student nurses should have a higher level of cultural competence as they have almost completed the course. However, the current study shows a moderate level of cultural competence among both senior and junior student nurses. Since the people in Sri Lanka live in a culturally diverse environment, every person could have a level of cultural competence,

and it can be the entry-level cultural competence shown by junior nursing students. In addition, since there is no significant improvement in cultural competence among the senior student nurses when compared with the junior student nurses, it is necessary to identify whether the current nursing education system in Sri Lanka offers the desired level of cultural competence for students who will become registered nurses eventually.

The question emerging here is, “does the nursing curriculum make any special effort to enhance the cultural competence of nursing students, while they are reaching to the top from the bottom?”. It is worthwhile to explore further whether the reason for this insignificant development of cultural competence is due to the inadequate content in the curriculum to address cultural competence or any other.

As further support to this question, McArthur revealed a significant relationship between cultural competence preparation and a consistent combination of cultural competence in nursing courses taught [18]. Therefore, evaluating the curriculum content and combination of concepts on cultural competence with other subjects or courses in every nursing school and nursing faculty in Sri Lanka is essential. Haller [19] also suggested enhancing the cultural competence of Nurse Educators through professional education and training programmes at an individual level. Furthermore, previous studies have highlighted the existence of significantly different competence levels among senior and junior nursing students/nurses [8, 17].

Considering these findings, the author suggests revising the existing nursing education curriculum to be able to provide more opportunities to enhance the cultural competence of student nurses. It can be done through professional education and training programmes. It will help enhance the individual level of cultural competence of student nurses.

Since student nurses have moderate cultural competence, it can be further improved by providing opportunities for clinical experience by selecting patients from diverse backgrounds, and also by using case studies. Using a variety of teaching strategies is vital in teaching cultural competence concepts to undergraduate nursing students [8]. Since the participants in this study have strongly indicated their desire to develop cultural competence, introducing some workshops and knowledge development sessions will also be useful for students who are currently in nursing schools.

The limitations of the study were as follows; Data were obtained through the self-administered questionnaire by the participant rather than measuring actual behaviour. It may have provided an opportunity for the participants to provide socially acceptable answers rather than stating the true situation. Furthermore, this questionnaire was only subjected to face and criterion validation, which resulted in a research limitation.

Conclusions and recommendations

This study revealed that both senior and junior nursing students have a moderate level of cultural competence, which is below the expected level of a healthcare professional in a culturally diverse country like Sri Lanka. Because of the cultural diversity, it is necessary to increase student nurses’ cultural competence to the highest possible level before becoming a registered nurse.

Conducting a similar study covering the other nursing schools and nursing faculties is recommended to ensure the generalizability of the findings. Further studies are required to examine Nurse Educators’ cultural competence level. Further, assessments for the curricula are necessary to recognise the adequacy of the cultural competence components in the curriculum.

Author declaration

Author contributions: All authors contributed to the conceptualization and design of the study. HSS contributed to the acquisition of data and conducted the data analysis. HSS and MKDLM contributed to data interpretation and writing the manuscript. All authors read and approved the final manuscript.

Conflicts of interest: The authors declare that they have no conflicts of interest concerning the research, authorship, and/or publication of this article.

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Table 1: Comparison of demographic data of junior and senior student nurses

		Junior		Senior	
		n	%	n	%
Sex	Male	10	6.8	6	4.0
	Female	140	93.0	144	96
Age	20-22 years	80	53.3	23	2.0
	23-25 years	70	46.7	133	88.7
	26-28 years	-	-	14	9.3
Education level	Up to A/L	143	95.3	124	82.6
	Diploma	6	4.0	25	16.7
	Graduate	1	0.7	1	0.7
Ethnicity	Sinhala	133	88.7	127	84.6
	Tamil	16	10.6	19	12.7
	Muslim	1	0.7	4	2.7
Religion	Buddhist	125	85.3	122	81.4
	Christian	5	3.3	5	3.3
	Catholic	6	4.0	5	3.3
	Hindu	10	6.7	14	9.3
	Islam	1	0.7	4	2.7
Comfortable Languages	Only Sinhala	73	48.6	64	42.7
	Only English	-	-	-	-
	Only Tamil	6	4.0	7	4.7
	Sinhala & English	58	38.7	60	40
	Sinhala & Tamil	3	2.0	3	2.0
	English & Tamil	7	4.7	8	5.3
	Sinhala, Tamil & English	3	2.0	8	5.3

Table 2: Comparison of the mean competence level of subscales and overall mean of the cultural competence of junior and senior student nurses

	Junior		Senior	
	Mean	SD	Mean	SD
Cultural awareness	3.80	0.37	3.94	0.35
Cultural knowledge	3.55	0.54	4.00	0.38
Cultural skill	3.48	0.71	3.77	0.50
Cultural encounter	3.54	0.56	3.63	0.44
Cultural desire	4.26	0.46	4.29	0.49
Cultural competence	3.72	0.38	3.92	0.28

Abundance, composition, peak active-period and vertical flight range of sand flies (Diptera: Psychodidae), the vector of leishmaniasis in Kurunegala district

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Abstract

Background: Leishmaniasis is identified as a neglected tropical disease in the world and considered a notifiable disease in Sri Lanka. It has shown an upward trend in Kurunegala district since 2008. Studies on vector bionomics, although important for implementing effective vector control, are still limited in Sri Lanka.

Objective: To describe the abundance, composition, peak active-period and vertical flight range of sand flies in the Kurunegala district

Methods: A descriptive study was conducted in two selected disease-endemic areas in Rideegama and Ibbagamuwa Medical Officer of Health areas in Kurunegala district during February-March, 2019. sand flies were collected using different standard sampling techniques (CDC Light-traps, Sticky-traps and Cattle-Baited-Net-Traps and by hand collections). The identification of sand flies was done up to Genus level. Sticky traps were set up at different heights on walls of houses to determine the vertical flight range of sand flies. The hourly sand fly collections were used to determine the active peak times. The abundance was calculated as per trap density and hourly collections were monitored to identify peak active-period of sand flies.

Results: The total number of sand flies collected during the study period was 773. The light-traps were found to be more productive than other collection methods. The numbers of sand flies belonging to genus *Phlebotomus* and *Sergentomyia* were 525 and 248 respectively. The average vertical flight range of flies was less than two feet from the ground level. A higher percentage of sand flies was collected from outdoors (n = 74%) than indoors (n = 26%). The highest active period of sand flies was between 18.00 hr and 22.00 hr of the day, although it was slightly different in *Phlebotomus* (from 18.00 hr to 20.00 hr) species and *Sergentomyia* species (from 18.00.00 hr to 22.00 hr).

Conclusions and Recommendations: Sand flies belonging to the genus *Phlebotomus* and *Sergentomyia* were present in the area. The peak aggregation time was at night starting at 18.00 hrs in the day for both genera. The vertical flight range of sand fly was approximately less than two feet from the ground level.

Key Words: Sand flies, composition, peak aggregation time, flight range

Background

Leishmaniasis is a disease affecting about 89 countries and is endemic to Asia, Africa, parts of North and South America and the Mediterranean. Globally it has been suggested that 12 to 15 million are infected. About 350 million worldwide are at risk of acquiring the disease which has made it one of the seven most important tropical diseases according to the World Health Organization (WHO). According to the statistics of WHO, around one million new cases are reported every year. WHO reported that poverty and unplanned urbanisation, deforestation, migration from non-endemic to endemic settlements have contributed to the epidemic of leishmaniasis [1]. Sand flies are considered as the vector of the *Leishmania* parasite which causes public health problems in many parts of the world. The dipteran flies transmit the *Leishmania* parasites, *Leishmania donovani* a protozoan parasite that causes leishmaniasis. The disease has several different forms including three main forms, namely, visceral leishmaniasis (VL), cutaneous leishmaniasis (CL), and muco-cutaneous leishmaniasis (MCL), where VL is considered to be the most virulent form of the disease.

In Sri Lanka first notified cutaneous leishmaniasis (CL) was in 1992. [2] By the year 2002, 65 cases, mainly from the northern dry zone were reported. From 2008, cutaneous leishmaniasis was included in the list of notifiable diseases in Sri Lanka. *Leishmania donovani* zymodeme MON-37 was identified as the causative agent of the CL in Sri Lanka [2]. *Phlebotomus argentipes* Annandale and Brunetti (Diptera: Psychodidae) are the major vectors of VL (kala-azar) in India [3]. The predominant sand fly species in Sri Lanka is also *Phlebotomus argentipes* [4].

In 2018, there was a considerable increase of leishmaniasis cases reported from Kurunegala district compared to the last three years (Weakly Return of Communicable Disease Data from Epidemiology Unit, Kurunegala). This is four folds higher than the average number of cases reported in 2017 and 2016 in the district. More than 25 cases were reported from the Rideegama, Ibbagamuwa, Giribawa, Alawwa, Polpitiyagama and Pannal MOH areas. The most affected area with the highest number of reported cases was Rideegama MOH area. Even though certain measures have been taken to control the vector and the disease

condition, the efforts have failed mainly due to the lack of proper understanding of the disease and vector. Sufficient information, especially on vector behaviour, host preference, peak biting time, breeding sites, resting preference, oviposition are unavailable to implement effective control measures timely.

There has been relatively little published research on the taxonomy, geographical distribution, behavioural habitats, feeding and breeding preferences as well as insecticide susceptibility patterns of sand flies in Sri Lanka. Without sufficient understanding of these aspects, the vector control strategies may not be effective to the expectation. Due to the prevailing disease conditions in the country, it is a timely need to identify and adopt correct preventive strategies to control this disease condition in Sri Lanka. These strategies need to be developed in an evidence-based manner. Therefore, comprehensive studies on vector species composition and bionomics will help to minimize the gaps in our understanding of the biology and ecology of this vector to implement proper control strategies.

Therefore, this study aimed to describe the composition, distribution, active seasonal fluctuation and bionomics of sand fly species in selected localities of Kurunegala district. This will help developing an effective vector control programme to minimize the possible leishmaniasis disease outbreak situation in the district.

Objectives

To determine the composition, abundance, peak active time and the vertical flight range of sand flies in selected localities in Kurunegala district

Methods

This descriptive study was conducted in two disease-endemic areas from February 25th, 2019 to March 31st, 2019. The selected localities were Ogodapola and Omaragolla in Kurunegala district in the lowland plain. Ogodapola area was located in Rideegama MOH area (N 7.55'67.56", E 80.47'55.3") and Omaragolla area was located in Ibbagamuwa MOH area (N 7.38'39.12", E 80.30',34.2"). Ogodapola area was known as a rural area and Omaragolla was a semi-urban area. Wild plants and bushes were abundant in gardens making the environment cool and well-nourished organic debris in the soil. Many

physical characteristics of the houses and surrounding environment support the biology and ecology of sand flies in these areas.

Sand flies were collected using CDC light traps, sticky traps, cattle-baited net traps, and hand collection using aspirators. CDC light traps were set in houses where positive cases had been reported. In each sampling site, two CDC light traps were set: one inside and the other outside the house for two consecutive nights for one sampling effort. Samplings were done for twelve hours from 18.00 hrs to 6.00 hrs and data were reported hourly. Since traps were negative for sand flies from midnight, the sampling was continued for six hours between 18.00 hrs to 12.00 hrs. A total of 20 CDC light traps were set during the experimental period for eleven nights in two selected localities.

Sticky traps prepared using transparent sheets coated with olive oil were placed in selected places, inside the house and surrounding environment including animal housing as well as close to the vegetation. These traps were set up in the sampling site at 18.00 hrs and they were collected for data reporting after twelve hours. For monitoring the occupied height level from the ground level and to understand the flying pattern of sand flies, these sticky traps were placed in 30 selected houses each in Omaragolla and Ogodapola areas. These traps were attached to the interior walls of houses at one foot, two feet, three feet from the ground level. Sand flies were also collected using a WHO-recommended cattle baited trap. Cattle-baited traps were set between 18.00 hrs–6.00 hrs within 10 m of houses where positive cases of leishmaniasis had been reported. Hand collection was performed using mouth aspirators indoor and outdoor.

Collected Sand flies were separated into labelled cups, stored in 70% v/v ethanol and morphological identification was done using available keys as specified by Lewis [5]. Temperature and Relative Humidity (RH) data were obtained from the Meteorology Department, Colombo, Sri Lanka. The findings were presented as numbers/frequencies and percentages.

Data were entered into Microsoft Excel and was analysed by Minitab version 16 for statistical analysis. Descriptive statistics were calculated including percentage, mean and standard deviation to describe the univariate analysis. One-way ANOVA was used to test the differences in the number of sand flies across

the different levels of independent variables such as per trap density, the height of ground levels. Pearson's correlation analysis was applied to determine the relationship between climatic parameters and the number of sand fly in two selected study sites. The level of significance was taken as 0.05.

Results

A total of 773 sand flies were collected which belong to two genera (Phlebotomus and Sergentomyia) during the experimental period and 57% (n = 417) of them were males while 43% (n = 316) of them were females. Sixty-nine per cent of the total population of sand flies were found to be exophilic. Of those exophilic flies, 61% were males.

The collected sand flies were belonging to the genus Phlebotomus (n = 199) and genus Sergentomyia (n = 132). Table 02 shows the relative abundance of two sand fly genera by the locality. According to the data, Phlebotomus was the predominant genus identified in Rideegama, Oogodapola area during the study period. There was no significant statistical difference between the abundance of Sergentomyia spp and Phlebotomus spp in study areas ($p = 0.119$, $t = 1.23$). The recorded average temperatures and relative humidities were 34°C and 59% in February and 38°C, 47% in March 2019. Figure 01 shows the behaviour of meteorological parameters and the number of sand flies. According to the correlation analysis, there is no statistically significant relationship between the meteorological parameters and the number of sand flies in two study sites during the study period.

When used the cattle baited traps, the total per trap density collection of sand flies was 41. The results showed that no significant difference was obtained between females (50.16%) and males (49.84%) in cattle-baited traps during the study period. It was observed that locality wise more females were attracted to cattle-baited traps in Ormaragolla area (n = 40, 86.95%) in Ibbagamuwa MOH division compared to the Oogodapola (n = 76, 50.16%) in Rideegama area. A total of 253 sand flies were collected using CDC light traps and 183 (72.33%) were found to be females. Males were 27.67% of the total. The number of sand flies collected using different types of traps is presented in Table 01. The CDC light traps and cattle baited trap methods were most productive compared to the other

two methods ($p = 0.02$, $F = 38.8$). Approximately 253 (12.65 per trap density) of sand flies were collected using CDC light traps.

Three rows of sticky traps were set up at three different heights (one Foot, two Feet and three Feet) on the indoor ($n = 54$) and outdoor walls ($n = 54$) of selected houses to determine the flight range of sand flies. There were 18 sticky traps set for in one house overnight. Out of 100 such sticky traps, four traps were positive for sand flies (Male = 4, female = 7). However, all these positive traps had been placed at the level of two feet from the ground indoors. These results suggest that these flies frequently rest close to the ground level.

The hourly collections of sand flies showed that *Phlebotomus* spp have two active peaks between 17.00 hrs–20.00 hrs and 2.00 hrs–4.00 hrs (Fig 02), while it was found to be between 18.00 hrs–23.00 hrs for *Sergentomyia* spp. However, these two genera are predominant between 18.00 hrs–23.00 hrs. Hourly collection of sand flies in indoor samples (Fig 03) indicated that *Phlebotomus* spp are highly active between 18.00 hrs–21.00 hrs while *Sergentomyia* spp are active between 20.00 hrs–23.00 hrs and 2.00 hrs–3.00 hrs. An outdoor sampling of these flies showed (Fig 04) that *Phlebotomus* spp are active between 18.00 hrs–24.00 hrs, while *Sergentomyia* spp are active between 20.00 hrs–23.00 hrs and 2.00 hrs–3.00 hrs.

Discussion

A study carried out to analyse epidemiological data showed that almost 90% of the leishmaniasis cases reported between 2009 and 2016 were from Anuradhapura, Hambantota, Polonnaruwa, Kurunegala, and Matara as endemic districts [4]. This research is the first preliminary study that has been carried out to determine the composition, abundance, flight range and peak active times of sand fly species in an endemic focus of leishmaniasis in Kurunegala District. According to our findings, *Phlebotomus* is the most abundant genus compared to *Sergentomyia*. Previous findings [6,7] have shown that sand flies belong to the genera of *Phlebotomus* and *Sergentomyia* are present in Kurunegala. According to past literature, the suspected vector of leishmaniasis in Sri Lanka belongs to genera *Phlebotomus* [8]. The findings of the

present study suggest that these flies are frequent close to ground level.

The highest activity of sand flies was recorded during the time period of 18.00–22.00 hr (84%) which is different from a previous study conducted in Sri Lanka where the peak aggregation of sand flies was observed during the hours of 20:00 to 23:00 hr [8]. In a study conducted in Italy, the peak activity of sand flies was found to be during 20:00–2.00 hr [9]. Some studies suggested that the peak activity of sand flies shifted from early evening (20:00–22:00) to late-night (22:00–00:00) due to seasonal changes [10]. Understanding monthly variations and activities of sand flies at different time intervals is important to determine the period of highest risk of leishmania transmission as well as to implement proper monitoring and efficient control strategies. However, we identified the time and the areas to be considered for the application of insecticides. Information obtained from this work conducted for the first time in Kurunegala district will facilitate the development of effective control programmes.

A study about the role of climatic factors in the seasonal distribution of sand flies in arid areas of India had revealed that the majority of species preferred comparatively high temperature and relatively low humid conditions [3]. The preliminary data of this study are not sufficient to make strong conclusions regarding this aspect. Therefore, further studies are needed for a proper understanding of the preferred environmental conditions, weather patterns as well as activity patterns of the reported sand flies.

Leishmaniasis vector control methods should be implemented after thorough investigations on vector, for instance, exact vector species, behaviour, breeding habits and places, resting places, distribution and other bionomic characteristics such as population fluctuations. In Sri Lanka, very few studies have been conducted on these aspects, hence, minimal evidence is there to support control programmes. The present study provides baseline information on the time and height levels to facilitate the implementation of chemical control methods.

Conclusions and recommendations

Sand flies belonging to the genus *Phlebotomus* and *Sergentomyia* were present in the area. The peak

aggregation time was at night starting at 18.00 hrs in the day for both Genera. The vertical flight range of sand fly was approximately less than two feet from the ground level. The findings of the present study will be

useful for leishmaniasis vector control methods since this is the first study of this nature conducted in this study setting.

Author declaration

Author contributions: All authors contributed to the conceptualization and design of the study. JMMKH and MRSSB designed the study. JMMKH, MRSSB, PGA, RPS and MACMM carried out the experiment and JMMKH, MRSSB, PGA, RPS supervised research team activities. PMRBIP and AMPCL contributed to the implementation of research. JMMKH wrote the manuscript with the help of MRSSB and PGA.

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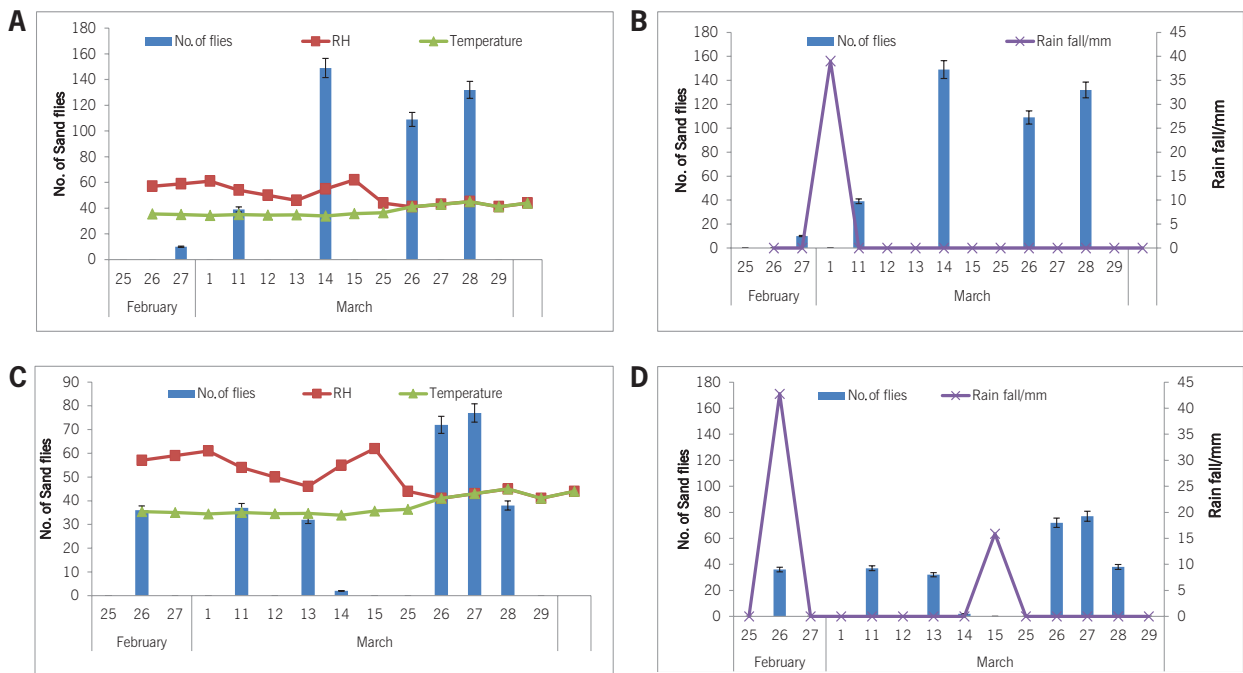
Table 01: Summary of the sand fly collection by different methods during the study period

Sampling Techniques	Total No. of Sampling Units	Total No. of collected sand flies	Per trap density
Light trap	20	253	12.65
Cattle baited net trap	9	369	41
Sticky trap	100	11	0.11
Hand collection	11 (Hours)	61	5.54 (per Hour)

Table 02: Relative abundance of Phlebotomus spp and Sergentomyia spp at each locality during the study period

Locality	Gender	Month	Sergentomyia	Relative abundance%	Phlebotomus	Relative abundance%
Ibbagamuwa	Female	Feb	11	8.3	16	8.0
		March	20	15.2	27	13.6
	Male	Feb	8	6.1	3	1.5
		March	55	41.7	22	11.5
Rideegama	Female	Feb	5	3.8	3	1.5
		March	9	6.8	15	7.5
	Male	Feb	0	0.0	51	25.7
		March	24	18.1	62	31.1
Total			132	100.0	199	100.0

Relative abundance: $nx/N * 100$, nx: number of individuals belonging to species x, N: total number of sampled individuals.



RH: Relative Humidity

A–Effects of RH and temperature on no. of flies in Ogodapola locality

B–Effects of rainfall on no. of flies in Ogodapola locality

C–Effects of RH and temperature on no. of flies in Omaragolla locality

D–Effects of rainfall on no. of flies in Omaragolla locality

Figure 01: Effect of meteorological factors on the number of sand flies in the two selected localities

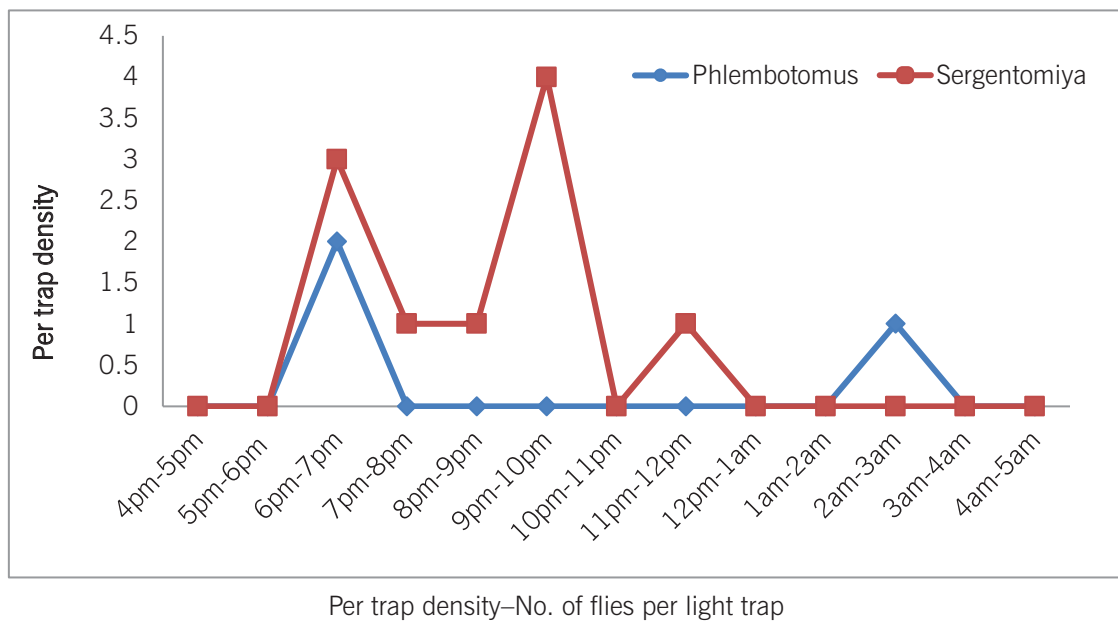
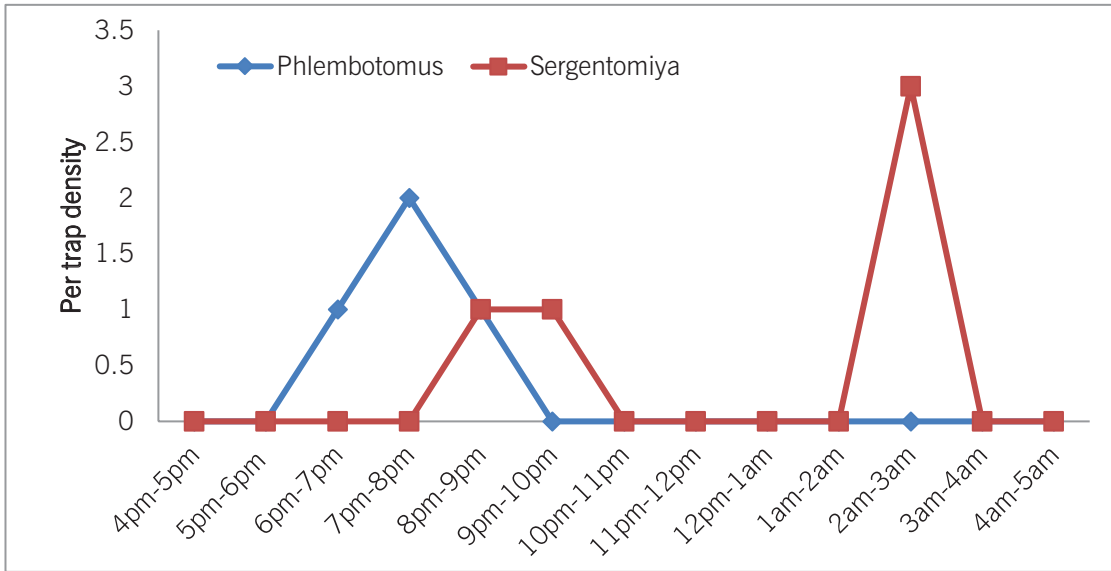


Figure 02: Two hourly activities of sand flies



Per trap density–No. of flies per light trap

Figure 03: Hourly activity patterns of sand flies–Indoor collection

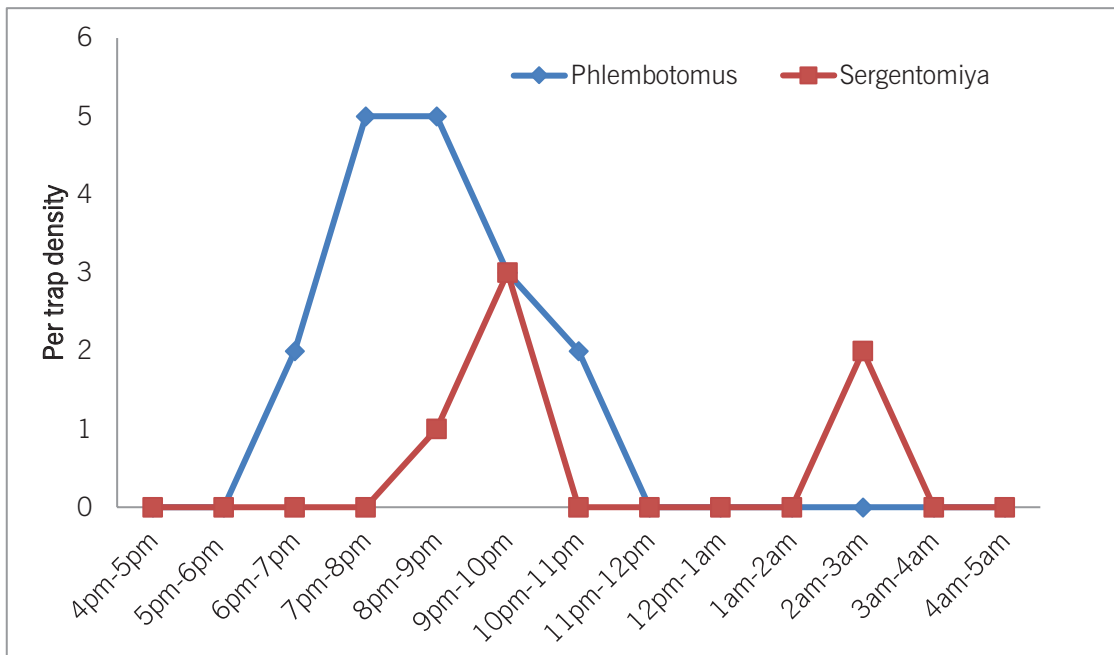


Figure 04: Hourly activity patterns sand flies–Outdoor collection

Coexistent dengue haemorrhagic fever and diabetic ketoacidosis: A therapeutic challenge

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Abstract

A 56-year-old Sri Lankan man presented with diabetic ketoacidosis (DKA) and he was in the critical phase of dengue haemorrhagic fever at the time of presentation. The concurrent presence of ketoacidosis and the leaking phase of dengue fever presents a challenge to a practising physician. He was successfully managed with careful fluid resuscitation taking into consideration the leaking phase of dengue fever and fluid depletion from diabetic ketoacidosis. The presence of diabetes increases the severity and the disease mortality in dengue fever. The metabolic disease-induced chronic inflammation and altered vascular endothelial integrity are thought to be the reasons for the increased mortality. Hyperglycemia results in polyuria which can mask oliguria and the depleted intravascular volume and shock status in dengue fever. Dengue fever can rarely precipitate diabetic ketoacidosis in diabetic patients. Using modified goal-directed fluid therapy according to the pathophysiology can avoid fluid overload and prolonged shock in complex situations.

Keywords: Diabetic ketoacidosis, dengue fever, dengue haemorrhagic shock

Background

Dengue is a mosquito-borne infection caused by the dengue virus. It is prevalent in Caribbean, South American, African, and Southeast Asian countries [1]. In Sri Lanka, it has become a major public health burden [2,3]. Sri Lanka has a significant burden of diabetes mellitus among its population [4]. Even though infection is a major precipitating factor for diabetic ketoacidosis (DKA), dengue fever is rarely known to cause DKA [5,6].

There are several potential interactions between dengue fever and DKA. The co-existence of both disease entities is a therapeutic challenge. Timely diagnosis and acute management with aggressive intravenous fluid administration, appropriate replacement of electrolytes, and administration of insulin are required to treat DKA [7]. In contrast, goal-directed careful fluid therapy is crucial in the management of dengue haemorrhagic fever. Hyperglycemia interferes with monitoring the patient's intravascular fluid status by resulting in polyuria even in volume-depleted or shock patients. Metabolic acidosis due to diabetic ketoacidosis can worsen the dengue shock state.

Case presentation

A 56-year-old man was admitted with polyuria, polydipsia, and postural giddiness. He was on aspirin and clopidogrel, having undergone primary percutaneous coronary intervention for inferior ST-elevation myocardial ischemia in 2017. He took losartan for hypertension and was on metformin for his type 2 diabetes mellitus. Further evaluation revealed a history of mild fever five days before admission which had settled at the time of presentation. He is a manual worker, nonsmoker and did not consume alcohol or illicit drugs.

On admission, the patient was conscious and rational, severely dehydrated, with cold peripheries and prolonged capillary refilling time. Blood pressure was 110/80 mmHg, pulse rate 100/min. Pulse volume was low. Lung fields were clear and air entry was equal bilaterally. The abdomen was non-tender, without evidence of ascites. His capillary blood sugar was high (> 600 mg/dl) with positive urine ketone bodies. Metabolic acidosis was evident in the venous blood gas analysis (Table 1).

Urgent fluid resuscitation was commenced as per diabetic ketoacidosis. A haematoma was observed at a site of venous cannulation and that led to the suspicion of the presence of a bleeding tendency or dengue fever. His regular dual antiplatelet and antihypertensives were withheld.

A full blood count revealed a platelet count of 4000/microliter and leukopenia. The full blood count results made dengue fever more likely. A bedside ultrasound scan of the abdomen showed free fluid in the hepatorenal pouch confirming the diagnosis of the critical phase of dengue haemorrhagic fever. Monitoring started assuming that the critical phase commenced six hours before admission. Packed cell volume (PCV) measurement before administration of fluid bolus was 60%. The PCV after administration of the first normal saline bolus (500 ml over one hour) was reduced to 58%. Another 500 ml normal saline bolus over one hour was given. After the second 500 ml bolus of normal saline, PCV was 55%, BP 115/80 mmHg, and pulse pressure was 35 mmHg. The rate of intravenous fluid was reduced to 350 ml over one hour and 250 ml over one hour in the next two hours. Intravenous insulin infusion (0.1 U/kg) continued with hourly capillary blood sugar measurements and electrolyte replacement. Hypokalemia was corrected with potassium chloride 40 mmol along with the normal saline infusions. Fluid therapy was modulated and reduced according to clinical parameters and PCV as per guidelines [3].

After total fluid resuscitation of 1690 ml, bilateral air entry was reduced in lung bases and finger-tip oxygen saturation was reduced to 92% on air. At that time, PCV was 50%, PR 110/min, BP 145/89 mmHg and pulse pressure 36 mmHg. A Dextran bolus (500 ml over one hour) was given, after which the air entry and oxygen saturation were improved, PCV reduced to 41%, tachycardia reduced to 100/min while blood pressure and pulse pressure remained normal. Fluid therapy was scaled down: 350 ml over one hour, 250 ml over one hour, 150 ml over one hour in the next three hours, and then continued as 100 ml/hour.

Insulin infusion was omitted once correction of acidosis was achieved and when bicarbonate was 13.6 mmol/l. He was established on a regular insulin regimen and frequent capillary blood sugar measurement was continued. Eventually, metabolic acidosis was corrected and ketone bodies were cleared.

He recovered from dengue haemorrhagic fever without complications. After recovery, the insulin regimen converted to oral hypoglycemic medication with gliclazide. Antihypertensives and antiplatelet were restarted. He was discharged home after arranging to follow up at the medical clinic.

Discussion

Diabetic ketoacidosis commonly presents with polyuria, polydipsia, nausea, vomiting, and abdominal pain. Orthostatic hypotension could be present at presentation due to intravascular volume depletion [7]. This patient presented with a full constellation of symptoms. The diagnosis of DKA was confirmed with a capillary blood sugar level of more than 600 mg/dl metabolic acidosis of pH 7.28, and positive urine ketone bodies.

The bleeding tendency was suspected because of the appearance of a haematoma during venous cannulation. As our patient gave a history of fever as well, dengue infection was suspected even before the laboratory investigations were available. Once DHF was confirmed goal-directed fluid therapy was instituted. Adequate fluid to restore the intravascular volume was given based on the trend in PCV. Dextran was used as per the guidelines. Blood pressure, pulse pressure, urine output, and PCV were monitored. Arterial blood gas, capillary blood glucose, and serum electrolytes were measured regularly and insulin infusion adjusted and potassium was replaced accordingly. It is important to avoid fluid overload during the management of the dengue leaking phase by avoiding overzealous intravenous fluid therapy. At the same time, it is vital to give adequate fluid when managing DKA to avoid persistent acidosis as it can lead to further complications. It is a therapeutic challenge to achieve the correct balance in fluid management when these two entities coexist. Close monitoring and judicious fluid management help to overcome this challenge.

Conclusion

This case report highlights the importance of considering the possibility of the coexistence of common diseases. It is vital to consider dengue infection when fever and bleeding tendency are noted. We emphasize the value of following the current guideline in managing fluid therapy in both these disease entities as it is paramount to achieve the correct fluid balance to avoid serious complications.

Author declaration

Author contributions: HWSP and KLRK led clinical management of the patient and reviewed the manuscript. WHM performed a literature survey, wrote and edited the manuscript. All authors read and approved the final version of the manuscript.

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Consent to participate: Written informed consent was obtained from the patient for publication of this case report.

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Table 1: First venous blood gas analysis

Parameter	Value
pH	7.28
pCO ₂	22 mmHg
HCO ₃	10.3 mmol/l
Base excess	-16.4 mmol/l
Lactate	5.9 mmol/l
Potassium	2.6 mmol/l

Table 2: Daily platelet count chart

Day of febrile illness	D 5 6 pm	D 6 5 am	D 6 2 pm	D 6 6 pm	D 7 5 am	D 7 2 pm	D 8 5 am	D 10 5 am
Platelet count 10 ³ /μl	4	14	13	20	21	59	73	110

Challenges related to information handling during the COVID-19 pandemic: Experience of a secondary care hospital in Sri Lanka

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Abstract

Information management is among the top priorities during the COVID-19 pandemic, as it is a key element in decision-making. This brief report describes the following challenges faced in information handling during the COVID-19 pandemic and the outcome of solutions introduced as a response: telemedicine, disease notification, record keeping, real-time hospital dashboards, recording/reporting hierarchies and clinic drug distribution.

Many countries experienced challenges in providing resources and finances, developing communication networks and in information management at the outset of the COVID-19 pandemic [1,2]. Information management was among the top priorities as it was a key element in decision-making. Challenges faced by Sri Lankan hospitals were similar, and effective use of information technology was imperturbably accepted by health staff and the general public [3]. This brief report focused to describe the challenges faced in information handling during the COVID-19 pandemic and the solutions introduced in response.

Homagama Base Hospital is a secondary care hospital in Colombo district with a capacity of 407 beds. It has the second-highest catchment population of the country as a health institution. It comprises medical, surgical, obstetrics/gynecology, paediatrics, psychiatry, and ear, nose and throat specialties. The hospital serves around 85,000 inward Patients, 100,000 clinic patients and more than 300,000 outpatients annually [4]. Emergency care is available twenty-four hours over

seven days of the week.

Hospital is equipped with a computerised hospital health information management system (HHIMS) developed by Information and Communication Technology Agency (ICTA). The Outpatient Department (OPD) functions completely through the computerised system since 2016, and in 2019 the family medical clinic which had the highest number of patient encounters started functioning through HHIMS. In the same year, the electronic laboratory information system was initiated which caters to the OPD. Data is saved in an institutional local server and a cloud backup is maintained. Software customization was done by ICTA while ground-level needs identification and implementation were coordinated by medical officers in health informatics guided by the hospital director.

With the onset of COVID-19 infection, the Director General of Health Services declared Homagama Base Hospital as a treatment centre for COVID-19 (suspected) patients with immediate effect. The hospital was given two days to discharge the admitted patients, terminate the routine services including OPD,

clinics and surgical procedures, and prepare to serve as a COVID-19 (suspected) patient treatment centre. Later when the number of confirmed cases began to rise in the country, the hospital was converted to a COVID-19 (diagnosed) patient treatment centre. In response to this, the hospital administration appointed a steering committee to facilitate hospital activities to meet the newly aroused challenges. The steering committee identified the possibility of using health informatics as a means of addressing the possible challenges in information handling at all levels among many other service needs.

A hospital information unit was established to identify and facilitate the conversion. A team of medical officers in health informatics from the Base Hospital Homagama, Western Provincial Directorate of Health Services and Ministry of Health voluntarily participated for need identification, coordination between hospital and software development agency, testing and implementation. Software customization was done by software engineers of ICTA and an agile method was adopted for development considering the uncertainty of requirement. The team identified the possibility of using health informatics solutions to address the challenges in communication barriers, record keeping and reporting, disease notification, provision of timely information for decision making at each level and coordination of clinic medicine distribution.

The key challenges addressed by the team were changes in information needs and problems in using the paper-based system. Information handling was critical for administrative decision making, managing logistics of the hospital, and disease control measures at the community level. Accuracy, completeness, and timeliness were very important in the context of a COVID-19 pandemic. Real-time information on bed occupancy was needed to accept patients from outside and allocate them to the wards ensuring optimal resource utilisation. Rapid patient turnover made the conventional paper-based logistic information pathways ineffective. Hospital operations such as meals allocation, supply of consumables to patients necessitated an efficient mode of information handling other than the conventional paper-based method. On the other hand, administrators were

looking for strategies to manage a possible mass influx of patients. A flexible admission system that enables patient admission to the hospital at multiple admission counters / multiple wards was needed. Maintenance of conventional hospital admission registers and having accurate hospital statistics is impossible in such a setting with a paper-based admission system.

From a preventive care perspective, disease notification was critical for contact tracing and quarantine process than at any other time in history. Due to the lockdown state, the routine postal pathway was not available, and not speedy enough in a setting of a rapidly spreading disease.

In addition to the disease notification process, which was established decades ago, new information needs arose in the setting of COVID-19 infection. Multiple task forces were established at provincial and national levels and state and military intelligence units were also participating in the contact tracing process owing to the scale and gravity of the pandemic. All those stakeholders' activities greatly depend on the information received from hospitals, as the first place of encountering suspected patients.

Multiple units of the ministries of health and defence requested patient information to coordinate preventive activities, prepare national statistics and coordinate logistic operations. The same information has been requested by several stakeholders in different formats. No stakeholder has considered the data structure of the hospital registries when designing their data formats. The time frames and structure of each unit did not have any uniform order. Some units needed daily data from 6 am to 6 am while some units prefer midnight to midnight. Satisfying these demands using a conventional hospital admission record system can be cumbersome, especially in a pandemic situation with a large number of patients.

Solutions for identified challenges

It was decided to use telemedicine solutions to address communication barriers and to customize HHIMS to facilitate record keeping, reporting, disease notification, provide information for decision making at each level and clinic medicine distribution. The admission module of the current HHIMS was

customised and the Bed Head Ticket was generated as a printed document from the system. Admissions, discharges, transfers and deaths were recorded using the computer system at the point of action.

- **Telemedicine:** Telemedicine solutions were used at the patient screening area which is the first contact area of patients to hospital, admission counter and in the wards. At the initial stage, intercom phones were used for communication owing to low cost and ease in configuration but encountered technical issues owing to routine spraying of disinfectant solutions using spray machines to sterilise the buildings. Both health staff and patients were annoyed by the doctor-patient encounters where they can't see the other party they are speaking with. This negatively affected the quality of the doctor-patient relationship. To address this issue, the institution shifted to videoconferencing. The NUC (Next Unit of Computing) devices were used. Internet access was provided by LGN (Lanka Government Network) through Wi-Fi connectivity. The NUC devices were installed inside a protective casing of board and glass to allow the disinfection process without damaging the equipment. Skype videoconferencing application and meet.gov.lk videoconferencing platforms were used interchangeably. This improved the quality of the doctor-patient relationship significantly.

Ward rounds had to be minimized as much as possible to minimize the risk to the staff and to limit the use of personal protective equipment. As a strategic solution hospital employed a robot equipped with videoconferencing equipment. It was used to monitor the ward and to communicate with individual patients. Because of the movability of the robot, in contrast to fixed video conferencing solutions, staff were able to communicate with patients by their bedside using video conferencing. This was of use when there were bedridden or disabled patients.

Critical care beds and the intensive care unit were provided with continuous video surveillance and two-way audio communication equipment. Special attention was made to provide a clear view of the monitors attached to the patient. This minimized the number of times staff had to enter the patient area to monitor patients.

Telemedicine solutions were readily accepted by the staff and significantly improved their perception of safety from possible infection from patients. Most importantly use of telemedicine significantly reduced the use of personal protective equipment in all patient care areas.

- **Disease notification:** The hospital HHIMS consists of a notification module, which activates electronic disease notifications to every encounter due to a notifiable disease. The system also provides the facility to easily send the notification form in H544 format to a predefined email address. This electronic notification system was used intending a complete, accurate and timely notification process. All the patients were notified, and all the notifications reached the intended endpoints on the same day of patient encounter at the hospital. Furthermore, e-notifications prevented the exchange of documents within multiple units of the hospital and outside the hospital, which was advantageous as a preventive measure against COVID-19 spread.

- **Record keeping:** Hospital admissions were recorded using HHIMS by admission nurses. Patients were registered into the HHIMS with their demographic and contact details and a health identification number is issued for every patient. A registered patient can be admitted to the hospital through the Admission, Discharge and Transfer (ADT) module. Bed head ticket number was issued automatically by the system. Registration and admissions were done at a single admission counter initially, but it was planned to do admissions simultaneously at each ward if a massive patient flow is experienced. All the wards were provided access to the HHIMS through Ethernet and Wi-Fi connectivity. Ward admissions, inward transfers and discharges were entered into the HHIMS by ward staff.

Due to automated admission number allocation, the integrity of the admission number was maintained despite the presence of multiple admission points. This allowed maintaining a single hospital admission register while functioning multi-point admissions.

- **Real-time hospital dashboard:** A hospital dashboard was developed to provide real-time statistics graphically for administrative, logistic and reporting purposes. The dashboard consists of two main sections: the daily information section and the

cumulative information section. The daily information section provided information on the number of currently admitted patients, their gender-wise and age-wise distribution, patient distribution within wards, daily admissions, discharge, transfer and deaths summary. The cumulative section provided cumulative patient total, outcome summary of all the cases and trend of patient encounters during the past seven days in graphical format. The dashboard was displayed at the hospital director's office, meeting room, main admission counter and health information unit.

The availability of real-time information empowered decision-making at each level. Hospital administration was able to make decisions on accepting patients from other institutions, resource allocation, staffing based on real-time information and provide briefings to superiors and media. Hospital daily logistics including the provision of food, consumables to patients were managed smoothly despite the complex context created by the total lockdown of the country. Availability, timeliness and accuracy of information played a significant role in the overall smooth functioning of the hospital workflow.

- **Reporting/Reporting hierarchies:** COVID-19 pandemic made real-time reporting of aggregated and individual information important more than ever. The standard method of collecting morbidity data was through indoor morbidity and mortality return (IMMR) which was prepared by the medical record unit on a quarterly and annual basis. But COVID-19 pandemic created a context where all the levels of the reporting hierarchy depend on real-time information for decision making owing to the critical nature of taking immediate decisions at all levels. This was critical for both preventive actions and the optimal functioning of logistic operations and resource allocation. New channels of reporting were needed to satisfy this need.

Aggregated admission, transfer and discharge information was needed by regional and provincial directorates of health, epidemiology unit, medical services unit, state intelligence services and military intelligence unit and provincial Covid taskforce. Whereas intelligence services and the epidemiology unit needed detailed individual patient information for contact tracing and coordinating screening and

quarantine measures. Due to the criticality of timeliness of reporting, email was preferred as the mode of communication. The hospital admission register was customised to meet the information need of the above stakeholders and made available as a downloadable PDF document which was emailed routinely to each stakeholder. The report can be generated for a selected duration of days and generated from 12:00 hour to 12:00 hour of selected days which was the standard practice in hospital settings.

- **Clinic drug distribution:** The hospital's routine functions including clinics were completely stopped. Patients of the hospital had no means of getting their clinic drugs. To address this issue, a call centre was established for clinic patients. All the patients who request clinic medicine were entered into the relevant clinic using HHIMS. A list of patients who requested medicine was given to the relevant clinic staff daily to coordinate dispatching of medicine, and administration for monitoring the process. This made cross-checking and responding to patients' inquiries about the state of their order more convenient, which is impossible in a paper-based system.

The hospital had 21 clinics, out of which family medical clinic (FMC) has the highest number of annual patient encounters and had 95,000 patient visits in 2019. The clinic operates through HHIMS, whereas all other clinics are still paper-based. Medicine dispatching in this clinic was observed to be significantly easier, faster and accurate.

Conclusion

The paper-based health information handling pathways were prone to be inefficient and ineffective in the context of a rapidly spreading pandemic. Rapid patient turnover and health service saturation, social lockdown and services and, communication disruptions due to distancing measures were unprecedented. Rapidly developing new information needs and the need for real-time information are the main reasons for this gap.

Telemedicine and health informatics solutions are important to address communication barriers and to facilitate record keeping, reporting, disease notification in a pandemic situation.

Author declaration

Author contributions: All authors contributed to the conceptualization and design of the study. MBRMCLJ, NDK, AKJMW, NMD, WDRP, SKPAF and AW contributed to the acquisition of data. UNP and ALAUL conducted the data analysis. JH, MBRMCLJ, AKJMW and SKPAF contributed to data interpretation and writing the manuscript. All authors read and approved the final manuscript.

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Novelty in the sphere of health human resources in Sri Lanka

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Abstract

A success story is reported on converting a manual recruitment scheme to a fully automated online scheme by the Human Resources (HR) Coordinating Division of the Ministry of Health in collaboration with the Department of Examinations, Ministry of Education, and the University of Moratuwa. This collaboration has successfully validated the educational qualifications of the applicants online and the procedures have been simplified for the applicants to complete the application within five minutes. The E manual published with details and prospects of courses on offer has greatly enhanced the intelligent course selection. This innovation has been internationally acclaimed and it had helped the Ministry of Health to address the shortage of nursing, professions supplementary to medicine, and paramedical categories in a positive manner.

As per a Cabinet decision, Human Resource (HR) Coordinating Division was established in 2017 in the Ministry of Health, Nutrition, and Indigenous Medicine, fulfilling a long-felt need. Positioning of the HR Coordinating Division was done as a “staff function” in the organizational context of the Secretary of Health and Director General of Health Services (DGHS) interface, where the Head of the Division reports to the Secretary while consulting the DGHS on relevant issues. One of the key activities of this newly created division was to introduce an online recruitment system to recruit trainees for various training courses conducted by the Ministry of Health (MOH) [1].

The MOH annually trains approximately 4,000 trainees of different categories: nursing; professions supplementary to medicine (PSM) including medical laboratory technologists, pharmacists, occupational therapists, radiographers, and also paramedical services including school dental therapists, health entomology officers, ophthalmic technologists, prosthetists and orthotists, public health inspectors, electrocardiographers (ECG recordists), electroencephalographers (EEG recordists) [2].

The recruitment process for the above categories had been a lengthy and labour-consuming task for the Ministry of Health. Following a notice in

the government gazette calling for applications for the above posts from GCE Advanced Level science stream qualified candidates, the Ministry receives around 20,000 to 30,000 applications by post. Even candidates without minimum qualifications apply. This necessitates significant hours of clerical work, sometimes leading to months; to open the envelopes, to open the applications, and enter the details into an MS Excel database.

Further, traditional paper-based recruitment systems are known for their shortcomings of lack of transparency, cost efficiency, timeliness, non-traceability, manual database keeping, and increased space required for storing paper-based applications [3].

The manual recruitment process took more than one and a half years to complete a recruitment cycle. The long recruitment process also resulted in a low yield of candidates. Further, prospective applicants and even some of the interview panel members had no idea about the courses on offer and their prospects. These flaws in this system contributed negatively to the country's health human resource stock as well as efforts to improve healthcare service delivery. The HR Coordinating Division introduced an online system to expedite the recruitment of trainees in collaboration with the Department of Computer Science and Engineering

of the University of Moratuwa and the Department of Examination of the Ministry of Education. Initially, it was a near-impossible task to convince the Ministry staff to switch from the traditional manual system which had been in operation for nearly 30 years. The new system application interface was user-friendly and login was via the Ministry of Health home page. Further, an E manual was published with the online application describing every course on offer in detail, along with the career development pathway for each course. On average it took only five minutes for the applicant to complete the application process. System was linked to the Ministry of Education and candidates' GCE Ordinary Level and Advanced Level results were verified within a few seconds, which earlier took many months. Using the online result verification, applicants without basic educational qualifications were not allowed to proceed from the very first stage. This reduced the work volume and increased the accuracy and transparency of the entire process.

For the first time in the history of the Ministry, the online system also facilitated the fulfilling the vacancies in the second round; created by non-registrants during

the first round. The online system helped to recruit trainees within a short time giving a high yield. The HR Coordinating Division has now successfully completed online recruitment for two cycles for nursing, PSM, and paramedical categories, recruiting around 9,000 trainees. Moreover, the Ministry of Health now has a good database of its future nursing, PSM, and paramedical human resource stock.

Our partners in this innovation acknowledged that they were able to learn how to successfully implement an E-recruitment drive and update their databases. Our staff now extend its fullest cooperation.

There had been many requests to expand the online scheme to other categories such as drivers and minor staff of the Ministry of Health. Several other Ministries too started similar recruitment schemes learning from our success. Continuation of the online system will help to reduce the shortage of PSM & paramedical and nursing workforce in the country.

(Above online recruitment scheme won an international award from Asia Pacific Action Alliance on Human Resources for Health (AAAH) in 2020)

Author declaration

Author contributions: DDS conceptualized the online recruitment scheme, developed and implemented it, and wrote the Brief Report based on his experience as the Head of Health HR Unit of the Ministry of Health. SDA provided policy-level advice and edited the manuscript.

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Anopheles stephensi: The new challenge in the prevention of re-establishment of malaria in Sri Lanka

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With an estimated 229 million malaria cases being reported in 87 malaria-endemic countries in 2019, malaria continues to be a major public health problem [1]. Following a decline of the malaria cases to near zero in 1963, malaria re-emerged as a public health problem in Sri Lanka in 1967. Despite the persistence of the vector, Sri Lanka interrupted malaria transmission and achieved zero indigenous cases since 2012. The certification of elimination from the World Health Organization was received in 2016. Sri Lanka is currently in the Prevention of Re-establishment (PoR) phase. During this phase, the focus is to maintain the country's malaria-free status by preventing the occurrence of introduced cases (cases contracted locally, linked directly to a known imported case) and indigenous cases secondary to introduced cases. Sri Lanka remains at high risk of re-establishment due to the continued presence of the malaria vector in the country as well as global travel and trade. Since the elimination, except one introduced case and one induced case of malaria reported in 2018 [2] and 2021 [3] respectively, all reported cases of malaria were imported (contracted abroad) [4]. In this background, as global travel and trade are inevitable, entomological surveillance and appropriate vector control measures play a vital role in sustaining malaria-free status.

The primary vector for malaria transmission in Sri Lanka is *Anopheles culicifacies*. *An. subpictus*, *An. annularis*, *An. vagus*, *An. tessellatus* and *An. varuna* have been identified as secondary vectors responsible for malaria transmission, all being rural species. In December 2016, for the first time in Sri Lanka, an invasive potential vector; *Anopheles stephensi*,

was found on the island of Mannar, during a routine entomological survey [5]. In September 2017, it was reported from the Vavuniya district and within one month, it was reported from the other three districts of the Northern Province. *An. stephensi* is a highly competent urban malaria vector, efficient in transmission of both *Plasmodium vivax* and *P. falciparum*. Empirical studies and records show that *An. stephensi* typically breeds in containers or cisterns with clean water [2]. Furthermore, it is found that this vector can quickly adapt itself to the local environment and withstand extremely high temperatures. Thus, it is considered an efficient vector of urban malaria. Until 2011, detection of *An. stephensi* was confined to several countries in South-East Asia and Arabian Peninsula [6]. It is implicated as the main vector of urban malaria in India and is reported to have caused malaria outbreaks [5]. A major issue encountered with *An. stephensi* is that the adult vector cannot be successfully controlled by main control methods used i.e., indoor residual spray (IRS) as they appear to be genetically resistant to a range of insecticides [6].

In Sri Lanka, *An. stephensi* is confined to four districts: Jaffna, Mannar, and Vavuniya districts (Northern Province) and, Kalmunai region (Eastern Province). Available entomological data reveals that *An. stephensi* primarily breeds in used/abandoned wells in Sri Lanka. Other breeding sites reported include overhead tanks, water storage cement tanks (ground level) and water storage containers (eg: barrels, buckets), and ponds [5]. Over the years, with improved transport accessibility and increased inter-district travel, the impending threat of *An. stephensi* introduction to

other areas, especially the Western Province is a matter of great concern. Previously malaria was an entirely rural disease in Sri Lanka and cities were spared of the disease because the vectors of malaria were rural species. Now with over 70% of the imported cases being reported from Western Province [7], the emergence of an urban vector like *An. stephensi* can have potentially dire consequences.

Eliminating or even controlling *An. stephensi* is a daunting task, needing continuous vigilance as well as well-executed control measures. It is vital to ensure the spread of *An. stephensi* is restricted to the current localities which by itself is a laborious task. In addition, continuous monitoring is also essential in other districts, where *An. stephensi* could migrate from the localities of Northern and Eastern Province. District borders with high population flux such as transport hubs are under continuous surveillance for *An. stephensi*. Hence, the Anti Malaria Campaign Head Quarters (AMC HQ) together with regional teams routinely conduct entomological surveys in high-risk areas of all districts to detect potential breeding sites. This activity is further strengthened by collaborating with the National Dengue Control Unit which has included *An. stephensi* identification in routine dengue larval surveys. This is facilitated by the fact that *An. stephensi* could breed in places where dengue vector breeds. This information is disseminated at the regional level. In areas where *An. stephensi* is already present, the AMC HQ and regional teams conduct frequent

entomological surveillance and carry out appropriate larval source management such as larviciding and introduction of larvivorous fish. By 2017, through rigorous vector control activities, AMC HQ was able to free several Medical Officers of Health (MOH) areas in Vavuniya (Vavuniya MOH), Kilinochchi (Karachchi and Palei MOHs), and Mullaitivu (Puthukudiirippu MOH) of *An. stephensi*. However, within this period the vector was reported in Jaffna, Kopai, Nallur, and Point Pedro MOH areas where control of *An. stephensi* was proving to be difficult. Following this, the AMC strengthened surveillance and control activities in Jaffna and Mannar, whilst maintaining vigilance in other districts. Yet, in June 2018, Kalmunai region reported *An. stephensi* in Akkaraipattu, Addalachchenai and Alayadivembu MOH areas with re-emergence of the vector in Vavuniya MOH in December 2019. A total of sixteen MOH areas in the four districts in North and East Provinces (including the above) have reported the presence of *An. stephensi* between 2017 to 2019. With the continued actions of the AMC HQ and regional teams, *An. stephensi* distribution has been brought down to ten MOH areas in 2020 and nine MOH areas in 2021 along with successful restriction of inter-district vector transmission. To date, there is no evidence of the expansion of *An. stephensi* to other districts of Sri Lanka. Considering the invasive nature and potential of this vector to transmit malaria in urban areas, strict vigilance and robust control measures are paramount to keep this vector at bay.

Author declaration

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Accelerated COVID-19 vaccination for Sri Lankans

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Sri Lanka has fared well in the face of the COVID-19 pandemic, due to its well-established and robust public health system. Distortions and non-scientific facts impeded the Ministry of Health's early response and mitigation process in the initial stages but were decisively defeated by excellent health promotional strategies. Most significantly, in this global crisis, when the country faces serious challenges, the efficient and effective mass immunization program that presently encompasses the entire country should

be emphasized. Despite global vaccine shortage and monopoly, the government was able to secure two doses of COVID vaccines and a booster shot required to vaccinate its citizenry. The successful vaccination campaign, on the other hand, reflects a well-planned and tailored primary health care approach, open and honest communication, people's understanding and readiness to receive COVID-19 immunization and the public's continued trust in the Sri Lankan public health system.



Photo credit: Dr Sarath Mandalawatta

Instructions to authors: Sri Lanka Journal of Health Research

The Sri Lanka Journal of Health Research publishes the following types of articles: editorials; leading articles; original articles including original research articles, systematic reviews and meta-analyses; case reports/case series; clinical audits; cover stories; picture stories; brief reports; updates on evidence-based practices in health policy and systems; manuscripts on continuous medical education; perspectives; opinion articles; commentaries; review articles; correspondence/letters to the editors; notices/obituaries/appreciations; and innovations.

Please refer to the following documents for more details:

- 1) Author guidelines;
- 2) Organization of the manuscript for original research;
- 3) Manuscript review flowchart;
- 4) Review process and decision framework;
- 5) Ethics framework; and
- 6) Author declaration

I. Author guidelines of the Sri Lanka Journal of Health Research

This document is intended to guide the authors in submitting manuscripts to the Sri Lanka Journal of Health Research (SLJHR), the official journal of the Ministry of Health, Sri Lanka. SLJHR is an open-access, peer-reviewed journal. Its mission is to efficiently and promptly publish rigorous, accessible, and relevant material that will help health professionals in Sri Lanka in their practice, lifelong learning, and career development.

01. Who is an author?

The SLJHR reserves the status of authorship for those who deserve credit for the intellectual contribution to the manuscript and can take the responsibility for the work. This is based on the International Committee of Medical Journal Editors (ICMJE) recommendations. The ICMJE also recommends that the authorship be based on the following four criteria:

- i) substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
- ii) drafting the work or revising it critically for important intellectual content; AND
- iii) final approval of the version to be published; AND
- iv) agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

In addition to being accountable for the parts of the work he/she has done, an author should be able to identify which co-authors are responsible for other specific parts of the work. In addition, authors should have confidence in the integrity of the contributions of their co-authors. All those designated as authors should meet all four criteria for the authorship, and all who meet the four criteria should be identified as authors. Those who do not meet all four criteria should be acknowledged.

The corresponding author is the individual who takes the primary responsibility for communicating with the journal during manuscript submission, peer-review, and publication processes. The corresponding author typically ensures that all administrative requirements of the journal such as providing details of the authorship, Ethics Review Committee approval, clinical trial registration documentation and disclosures of relationships and activities are properly completed and reported although these duties may be delegated to one or more co-authors. The corresponding author should be available throughout the submission and peer-review process to respond to editorial queries timely, cooperate with any requests from the journal for data/additional information, and respond to critiques/questions on the work after publication.

02. Types of manuscripts that SLJHR will consider:

The SLJHR will accept the following types of

manuscripts for publication: editorials; leading articles; original articles including original research articles, systematic reviews and meta-analyses; case reports/case series; clinical audits; cover stories; picture stories; brief reports; updates on evidence-based practices in health policy and systems; manuscripts on continuous medical education; perspectives; opinion articles; commentaries; review articles; correspondence/letters to the editor; notices/obituaries/appreciations; and innovations.

Further details about the format of each of these types are described under 03 (A) below.

03. Preparation of manuscripts for SLJHR and submission to the Journal:

03 (A) Preparation of manuscripts

1. Editorials and leading articles

These give a balanced overview of the current state of development of an emerging area. They usually do not exceed 1,500 words and are devoid of any tables and illustrations. It might have references. These may be solicited by the editors from the experts in a given field and SLJHR does not accept unsolicited manuscripts under this category.

2. Original articles

The SLJHR entertains the following categories of original articles: original research articles; systematic reviews; meta-analyses. Original research articles are based on original research studies where there is primary data collection.

Original articles have to adhere to the reporting guidelines relevant to the respective study design. These reporting guidelines help authors describe the study in adequate detail for it to be evaluated by editors, reviewers, readers, and other researchers. The authors are encouraged to visit EQUATOR (Enhancing the Quality and Transparency Of health Research) Network (<https://www.equator-network.org/reporting-guidelines/>) which is an international initiative that aims to improve the quality of research publications and US National Library of Medicine (https://www.nlm.nih.gov/services/research_report_guide.html) which provide a comprehensive list of reporting guidelines and other material to help improve reporting.

The reporting guidelines for specific study designs are as follows:

Type of study	Reporting guidelines
Randomised trials	CONSORT and Extensions
Observational studies	STROBE and Extensions
Systematic reviews	PRISMA and Extensions
Study protocols for clinical trials and systematic reviews	PRISMA-P, SPIRIT
Prediction model for individual prognosis or diagnosis	TRIPOD
Diagnostic accuracy studies	STARD
Case reports	CARE and Extensions
Clinical practice guidelines	AGREE, RIGHT
Qualitative research	SRQR, COREQ
Animal pre-clinical studies	ARRIVE
Quality improvement studies	SQUIRE
Economic evaluations of health interventions	CHEERS

Manuscript sections of original articles: Please refer to the document below titled “Organization of the manuscript for original research for the Sri Lanka Journal of Health Research”.

3. Case reports/Case series

The SLJHR will only publish cases with valuable clinical lessons. Case reports and case series should be prepared conforming to the Consensus-based Clinical Case Reporting (CARE) guidelines (<https://www.care-statement.org/checklist>). The word count is 1,500 for a case report and that for a case series is 2,000. These should not contain more than two tables/illustrations and five references. It could contain up to a maximum of two pictures. Case series need Ethics Review Committee approval but not case reports. However, obtaining the patient’s consent is mandatory for case reports.

4. Clinical audits

‘Clinical audit is a quality improvement process that seeks to improve patient care and outcomes through a systematic review of care against explicit criteria and the implementation of change. Aspects

of the structure, processes and outcomes of care are selected and systematically evaluated against explicit criteria. Where indicated, changes are implemented at an individual, team, or service level and further monitoring is used to confirm improvement in healthcare delivery.' (www.nice.org.uk. Principles of Best Practice in Clinical Audit 2002). Clinical audits are not considered as original research by the SLJHR. The authors are encouraged to go through the related links and the following when they submit manuscripts based on clinical audits. <https://www.hqip.org.uk/wp-content/uploads/2018/02/documenting-local-clinical-audit-a-guide-to-reporting-and-recording.pdf> (Documenting local clinical audit: A guide to reporting and recording, Healthcare Quality Improvement Partnership, UK). The word count is 1,500 – 2,500.

5. Cover stories

Authors need to submit cover stories based on a contemporarily or historically important issue/event in the areas of health services management and delivery. It needs to be submitted preferably with a picture that will appear on the front cover of the journal. If there is no picture associated with the cover story, the editors will find a suitable picture for the article. The title has to be catchy and the lead paragraph has to summarize the main ideas of the article. The word count is 250.

6. Picture stories

This is an unstructured narrative consisting of less than 300 words based on a picture that is powerful enough to create an understanding and/or empathy among the readership towards an issue that is important yet not sufficiently attended in healthcare delivery. The stories should also briefly discuss what is portrayed in the picture and should also highlight the challenges to the healthcare system. The picture could be an image or an illustration.

7. Brief reports

Brief reports could be based on original research, novel public health and patient management interventions, hospital management practices, etc. Public health innovations and best practices that have yielded evidence-based results are also considered. Brief reports should be limited to 2,000 words, three tables/illustrations and ten references, and may have an unstructured abstract of fewer than 300 words.

Articles that are based on ongoing projects without evidence-based results will not be accepted. Please see B.11 below too.

8. Updates on evidence-based practices in health policy and systems

These manuscripts need to be based on updates on health policy and guidelines relevant to Sri Lanka. The implications to the health system strengthening, patient care and public health practices should be highlighted. Unstructured articles with a word count of less than 1,000 are considered. Those do not require an abstract. Necessary references should be stated. Those articles without tangible outcomes will not be accepted. Please see B.11 below too.

9. Manuscripts on continuing medical education

These could be concerning medical, nursing, paramedical or professions supplementary to medicine. The article should clearly demonstrate the author's expertise in the area. Only the articles of sufficient quality which have clearly demonstrated the worth of the article in assisting relevant health professionals in carrying out their professional responsibilities effectively and efficiently will be published. The word count should be less than 750. Please see B.11 below too.

10. Perspectives

Perspectives intended for publishing in SLJHR has to present a new and unique viewpoint on existing problems, fundamental concepts, or prevalent notions on a specific topic, propose and support a new hypothesis or discuss the implications of a newly implemented innovation. These could also focus on current advances and future directions on a topic. They need to be intended to stimulate a discussion. These articles may contain original data as well as personal opinions. Abstract, tables and figures are not warranted. There can be references. The word count is 2,000-3,000.

11. Opinion articles

Opinion articles present the author's viewpoint on the strengths and weaknesses of a hypothesis or scientific theory. Opinion articles are generally based on constructive criticism and should be backed by evidence. However, opinion articles do not contain

unpublished or original data. These articles promote scientific discourse that challenges the current state of knowledge in a particular field. Opinion pieces are also relatively short articles, of around 2,000-2,500 words, typically with a short abstract of about 150 words, at least five references, and one or two figures or tables.

12. Commentaries

Commentary articles are generally agenda-setting, authoritative, informed and often provocative expert pieces calling for action on topical issues about scientific research and its political, ethical and social ramifications. They do not simply snapshot a problem, but roadmap a proposed solution in detail. Alternatively, comment pieces can be writerly historical narratives or conceptual or philosophical arguments of pressing contemporary relevance, told with authority, colour, vivacity and personal voice. These attempts to bring an original perspective before the widest readership, through erudite reasoning and giving examples. Commentaries can draw attention to or present criticism on a previously published article, book, or report, often using the findings as a call to action or highlighting a few points of wider relevance to the field. Commentaries do not include original data and are heavily dependent on the author's perspective or anecdotal evidence from the author's personal experience to support the argument. However, if an author intends to publish such content, he/she can solicit permission from the editors to submit this to SLJHR. Commentaries are usually short articles of less than 1,000 words and are in most cases invited by editors from experts in the field. They include a few references, and one or two tables and figures. No abstracts are needed.

13. Book reviews

These have to be unbiased analyses, as decided by the Editorial Committee, of books from the fields of medicine, nursing, allied health Sciences, complementary and alternative Medicine and related fields published during the last two years in Sri Lanka. The review should consist of an introduction including the bibliographic details of the book, intended audience, scope and objectives and a critical analysis of its contents. The editors of the newly published books are encouraged to send them to the journal if they wish to have a review published in SLJHR. If the Editorial Committee agrees that the relevant book needs a

review published in SLJHR, it will seek the contribution of the experts of that field to write the review. The word count is 1,000.

14. Correspondence/Letters to the editor

Correspondences are the readers' reactions to technical and other material published in SLJHR. These are made as a reply to a previously published article in SLJHR. These could range from methods to implications. These should be submitted within four weeks of the online publication of a manuscript. The original authors will have to frame appropriate responses to such correspondence. Correspondence submissions are not usually peer-reviewed and will be edited appropriately without altering the original meaning to suit the publication. These have to be less than 300 words and need to have a maximum of two authors.

15. Notices/Obituaries/Appreciations

We welcome suggestions of the readers to inform us of those deserving an obituary in SLJHR. These suggestions can be emailed to sljournalhr@gmail.com with the word 'Obituary notice' in the email title. The editors' decision will be the final. Notices and appreciations will be decided by the editors based on the objectives of SLJHR and the Ministry of Health, Sri Lanka. The word count is 500.

03 (B) Submission of the manuscript

The first issue of the SLJHR will be made from the articles submitted through email to the Editorial Office. From the second issue onwards, to submit an article, the corresponding author needs to log in to the journal management system through <https://sljhr.sljol.info/author/login/?submit=True>. The authors who have an ORCID account can log in through that and those who do not have will have to create an account. Once you sign in, you will be directed to the manuscript submission.

The manuscript submission consists of five stages: start; author details; article details; upload files; and review and submit. On the start page, there is an 'Author agreement'. You will be notified of the following submission requirements and you will have to make a declaration that your manuscript adheres to all these submission requirements. Please note that the SLJHR does not charge any publication fee from authors.

B.1	The manuscript has not been published elsewhere nor submitted to another journal for consideration for publication. If the manuscript has been partly or fully published elsewhere, a full statement of all previous publications should be attached. This should include the presentations of abstracts made from the same original article/clinical audit or other publication types. Any such work should be referred to specifically and referenced in the new manuscript. Copies of such material should be included with the manuscript to help the editors assess the situation about the redundancy of the material to be published. Authors are also encouraged to submit any previous communications from other journal editors or reviewers if the manuscript has been previously submitted to another journal.
B.2	The manuscript will not be submitted to another journal for review until the final decision is reached by the editorial board of SLJHR. If the authors decide to withdraw a manuscript from review, it could be immediately notified through the online system.
B.3	If the manuscript is accepted for publication, the authors grant the Ministry of Health, Sri Lanka a license to publish the article and to identify itself as the original publisher. Please read the Copyright Notice below.
B.4	The submission file needs to be in Microsoft Word or RTF file format.
B.5	The text is double-spaced; uses 10-point NewsGoth Lt BT font; all page numbers and line numbers are inserted; and all illustrations, figures, and tables are placed after the reference list.
B.6	The text adheres to the stylistic and bibliographic requirements outlined in the Author Guidelines, which are found in the "About the journal" tab.
B.7	The co-authors have read the manuscript and approved its submission.
B.8	A duly filled Cover Letter and the Author Declaration form should be separately uploaded. All authors have to place their signatures in the Cover Letter.
B.9	The authors agree to the terms of the Copyright Notice, which will apply to this submission if and when it is published by this journal.
B.10	The authors declare that the article is free from any conflicts of interest and ethical issues. When the authors have obtained Ethics Review Approval from an Ethics Review Committee accepted by the Ministry of Health Sri Lanka, it should be uploaded together with the manuscript. The administrative approval letters need also to be uploaded especially when the article/research is related to the work carried out by the Ministry of Health, Sri Lanka.
B.11	When a manuscript is submitted under the categories of brief reports, updates on evidence-based practices in health policy and systems and manuscripts on continuing medical education, it is always good to include a description of the author's expertise in the respective areas in the Cover Letter.

04. Copyright notice

The public has the freedom to use, copy, distribute, remix, adapt, and build upon the authors' work, as long as they credit the author/s for the original creation. The Ministry of Health, Sri Lanka will be identified as the original publisher. Authors of the articles published in SLJHR retain the copyright of their articles. The authors, the Ministry of Health Sri Lanka and the readers are free to reproduce and disseminate the published work provided that the original work is properly cited.

05. Privacy statement

The personal information which appears in SLJHR will be used exclusively for the stated purposes of this journal and will not be made available for any other purpose or to any other party.

06. Editorial procedure

Each manuscript submitted to the SLJHR is evaluated by the editors in chief. The manuscripts that do not meet the criteria listed under the Author Guidelines of SLJHR will be returned to authors without considering its content for review. The manuscripts which have been submitted following the Author Guidelines will be further processed.

07. Peer-review process

The SLJHR follows a double-blind peer review process, which means that both reviewer and author remain unknown to each other. Each article is reviewed by two independent reviewers and a statistical expert within three weeks. The names of the authors will not be revealed to the Editorial Committee until the final decision on the acceptance/rejection of the manuscript is taken. The estimated time from submission to the first decision is within 10 weeks.

The review will focus on health implications, originality of the work, the scientific rigour of the manuscript and ethical conduct. The review will be done among the members of the editorial committee if it is within the expertise of the committee. If the editors in chief/editorial committee feel that the submitted article needs review by an external reviewer, it will be reviewed by two members of the external review panel. The external reviewers will be experts on specific content areas and will represent different categories of health professionals.

Each reviewer is supposed to go through the whole manuscript, make the necessary comments and changes in the manuscript in its MS Word document using Comments and Tracked Changes, and also give independent recommendations at the time of submitting the decision. When submitting recommendations, they will have to declare that they do not have any conflicts of interest in reviewing the relevant manuscript. The final decision on the manuscript will be made based on 'The decision framework for the Sri Lanka Journal of Health Research'. Selected articles based on that framework will be discussed at the editorial committee meeting.

The editorial committee meeting will be held once in two months at the start. All the reviewers are supposed to send their comments two weeks before this meeting. All primary reviewers are supposed to join the meeting in person or through video conferencing. An attendance policy will be in place to ensure adequate participation of the editorial committee members to the meeting.

The decisions for any manuscript will be as follows:

- 'Accepted'—Manuscript is accepted for publishing

without further revisions to the manuscript;

- 'Revisions required'—The author needs to resubmit the manuscript with suggested minor or major changes to the article for review by SLJHR again; and
- 'Rejected'—The author is not entitled to resubmit the same manuscript to SLJHR again.

The comments and recommendations will be communicated to the authors within one week after the decision is made. Resubmission after revisions will have to be submitted within three weeks. All resubmissions will have to be submitted in compliance with the instructions stated in the due format addressing each concern/comment made by the editors and reviewers.

Two reminders will be sent to the authors about the deadlines for resubmissions. If there is no response from the authors even after two reminders or the resubmission is delayed without any valid reason, these articles will be removed from the system.

When the members of the editorial committee also wish to submit manuscripts to SLJHR, these too will be processed in the same way as all other manuscripts received by the journal. However, due to conflicts of interest, these manuscripts will not be reviewed and edited by the same members and they do not participate in the final decision-making process. The number of manuscripts published where the Editorial Committee members and editors in chief are involved will be kept to a maximum of one.

Authors' appeal

All authors have the liberty to appeal if they think the decision of the SLJHR on a submitted manuscript is unfair. Such appeals will be answered by the editors in chief based on the stated editorial policy. However, in an appeal, the decision of the editors in chief will be final.

Comments of readers and authors

Readers and authors are also welcome to submit comments to the published articles. Authors of the criticized article have the opportunity for responding to such comments. All such written material should be submitted as any other manuscript through an online submission system.

08. Section policies for future publications in SLJHR

No	Type of the manuscript	Open submissions	Solicited submissions	Peer-reviewed
1	Editorials/Leading articles	-	x	x
2	Original articles	x	-	x
3	Case reports/Case series	x	-	x
4	Clinical audits	x	-	x
5	Cover stories	x	x	x
6	Picture stories	x	x	x
7	Brief reports	x	x	x
8	Updates on evidence-based practices in health policy and systems	x	x	x
9	Manuscripts on continuous medical education	x	-	x
10	Perspectives	x	x	x
11	Opinion articles	x	-	x
12	Commentaries	-	x	x/-
13	Book Reviews	-	x	x
14	Correspondence/Letters to the editor	x	-	-
15	Notices/Obituaries/Appreciations	-	x	-

II. Organization of the manuscript for original research for the SLJHR

General comments

- The SLJHR entertains the following categories of original articles: original research articles; systematic reviews; meta-analyses. Original research articles are based on original research studies where there is primary data collection.
- All original articles will have to adhere to the reporting guidelines relevant to the respective study design as specified in the Author Guidelines.
- All parts of the manuscript, including tables and figures, legends, references must be of double spacing. The computer language is English (UK).
- Keep abbreviations to a minimum, particularly when they are not standard. If it is necessary to use an abbreviation, make sure it is spelt out fully in the text or a legend the first time it appears.
- The word count for the manuscript, excluding the abstract, references, figures and tables and supplementary material is 2,500–4,000.
- The manuscript should accompany a 'Title Page', which contains general information about the article

and its authors. This usually includes the manuscript title, author information, any disclaimers, sources of support, word count, and sometimes the number of tables and figures.

Title of the manuscript

- The title should be clear and concise, reflecting the essence of the study. It may be catchy/interesting to the reader.
- It may specify the study population and the study setting and may contain important keywords.
- A full stop is not needed at the end of the title and it cannot contain the phrases such as "a study on"/"an investigation into".

Authors

- The list of authors should be in the order of which the names should appear at the time of publication.
- The full name and the institutional affiliation of all authors, and the email address of the corresponding author need to be stated. The ORCID of the first/ corresponding author needs to be included.

The main text: General comments

- The manuscript has to be arranged according to the following sections: abstract; background; objectives (need not be divided as general and specific); methods (without any subheadings); results (may contain subheadings); discussion (without any subheadings); conclusions and recommendations; information under author declaration with author contribution, conflicts of interest, ethics approval, acknowledgement and funding; references; and tables and figures.
- In each section, the sentences have to be clear and short. Each sentence should start with a word and not with a number or an acronym. Each paragraph usually conveys a single idea and may consist of several sentences. It is better to shift to the next paragraph when a new idea is generated.

Abstract

- The abstract should be structured under the following headings: background, objectives (to include the general objective only), methods (a concise version of study design, study setting, study duration, study population, sampling technique, sample size, study instruments, data collection, statistical analysis and any other relevant information), results (on the specific objectives in a concise form), conclusions (according to the specific objectives) and recommendations, and keywords (derived from the title, usually 3–5).
- The word count is 350.

Background

- The Background starts by defining the research problem (central concept of the study or the dependent variable).
- Description of the nature of the problem (the discrepancy between what it is and what it should be), the size and severity (magnitude) of the problem and distribution of the problem (who is affected, where, since when, and what are the consequences for those affected and for the services).
- An analysis of the major factors that may influence the problem (probable causes) and the unknown factors, and a discussion of why certain factors need more investigation if the problem is to be fully understood.
- A description of any solutions to the problem that have been tried in the past, how well they have worked, and why further research is needed (justification for your study).

- A description of socio-economic and cultural characteristics and an overview of health status and the healthcare system in the country/district, as far as these are relevant to the problem.
- Justification for the study should be based on the identified gaps—theoretical gaps, methodological gaps, empirical gaps and contextual gaps. Potential benefits of the study findings (how the knowledge generated will be useful and generally applicable to solve the identified research problem) should be mentioned here. The justification has to be done convincingly.

Objective/s

- Objective/s should be clearly phrased in operational terms using action verbs (not to use action verbs such as to understand, to study, etc.). The general objective, and when indicated, specific objectives have to be included. Inclusion of the study setting, study population and the study period within the statement of the objective is not essential unless the inclusion of these clearly explains the objective/s furthermore.

Methods

- This section has to contain the following whenever appropriate in a single paragraph (however, there is no need to have subheadings for the following or name these subcategories in the text): study design; study setting; study period; study population/s with inclusion and exclusion criteria; sampling method and sample size; study instruments; study implementation with relevant details such as data collectors and training of them; data analysis; administrative requirements; ethical issues; and definitions of relevant variables/operationalisation of the variables.

Results

- Results have to be written in the past tense.
- The sample size and the response rate need to be stated.
- Description of the sample in terms of relevant socio-demographic characteristics is necessary where relevant.
- The author may organize the results into different paragraphs for the different objectives.
- Detailed results should be presented in tabulated form (tables) whenever appropriate. Figures/charts may be used sparingly according to the need. Tables

and figures should be numbered according to the order in which it appears in the text.

- The maximum number of tables to be included is four and the maximum number of figures is two. Other material may be included as supplementary material separately as suitable.
- Always the percentages described in the text should be supported by the relevant raw data (frequencies) in parenthesis and vice versa. eg: 78.5% (n=252)
- Relevant descriptive and inferential statistics should be presented in detail with an interpretation of the findings in the text.

Discussion

- This section must include the results in contrast to the findings of other studies along with the public health relevance of the findings, suggestions for future research and ethical issues. Limitations of the study, if any, need to be included here.

Conclusions and Recommendations

- Conclusions should be the answers to the objective/s written in summary form with minimal statistical information.
- Recommendations should be relevant and arising out of the study. Those should be practical and clearly stated in terms of implementation.

References

- The Vancouver style needs to be followed.
- Just enough references that are required for your paper are to be cited.

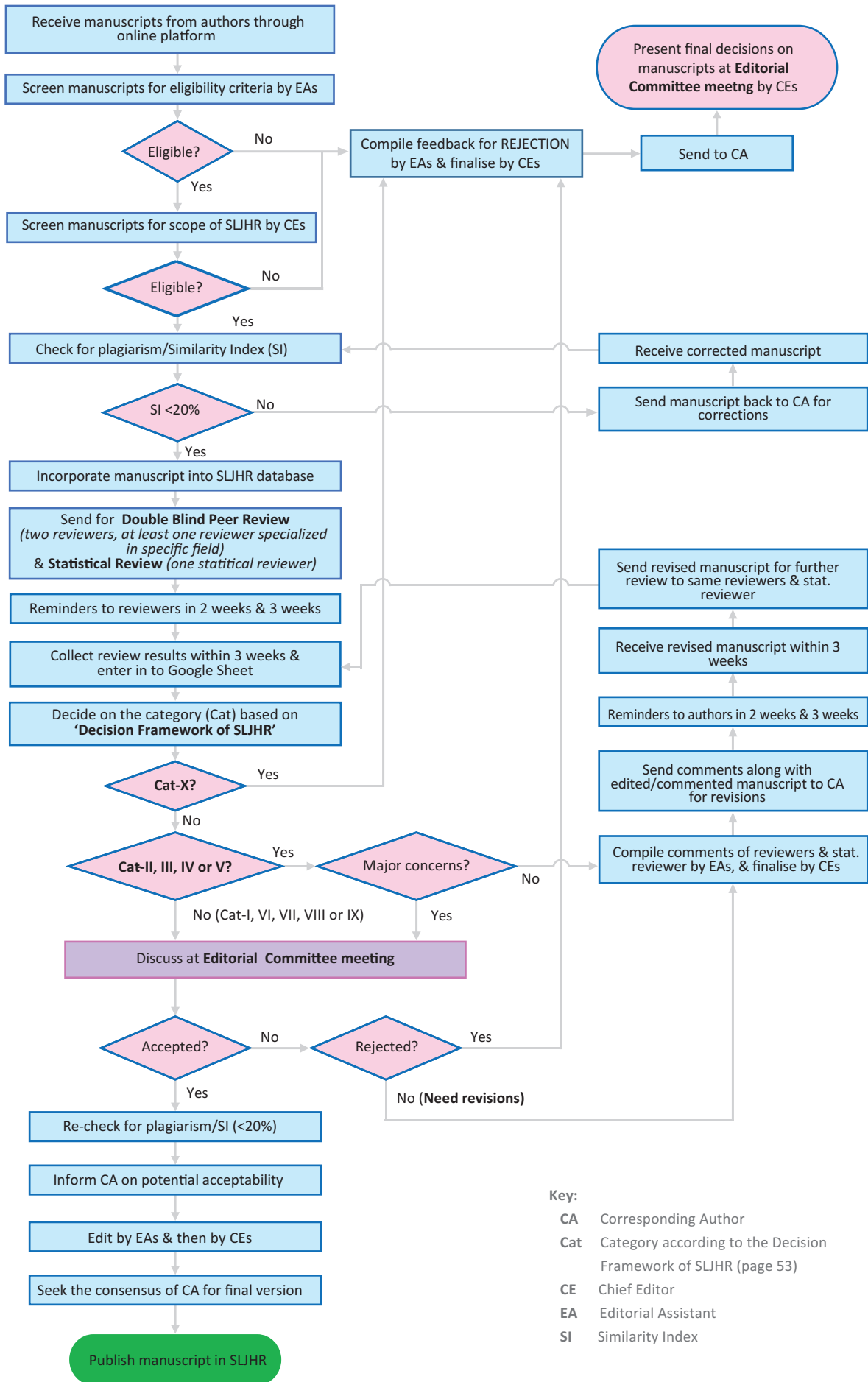
Tables and Figures

- The row heading and text inside each cell should be left-aligned and the numerical values should be right-aligned.
- Important values need to be in bold.
- The font size of the content in each cell should be adjusted to fit the size of the cell.
- No space should be kept between parenthesis and the value included in the parenthesis. eg: 78.5% (n=252)
- When there are two or more categories in respect of a single variable, make sure that every value in the range belongs to either category.

Author declaration

- **Author contributions** – The respective roles performed by individual authors from conception to the dissemination of the research should be mentioned.
- **Acknowledgements (optional)** – this has to be confined to those who do not qualify to be an author, but still who have extended support in carrying out the research.
- **Funding and conflicts of interest** – All financial and non-financial conflicts of interest need to be declared. Sources of funding are also to be mentioned.
- **Ethics approval and consent to participate** – If your study involves human subjects and/or animals, you need to provide the name of the Ethics Review Committee. If the study was exempted from the review process by an Ethics Review Committee, this too needs to be stated. If verbal informed consent was obtained, the reason/s for not obtaining the written consent must be provided.

III. Manuscript review flowchart



Key:
 CA Corresponding Author
 Cat Category according to the Decision Framework of SLJHR (page 53)
 CE Chief Editor
 EA Editorial Assistant
 SI Similarity Index

IV. Review process and the decision framework of the SLJHR

Each manuscript will be screened by the editorial board (editors in chief/nominated editorial committee member/editorial assistants) to see whether the article has been prepared according to the instructions given in the Author Guidelines and to see whether the required material eg: Author Declaration, Ethical Clearance (when needed) and other supplementary material have been attached. (This will be applied from the second issue onwards).

1. Each manuscript will be reviewed by two reviewers, at least one from the discipline concerned or related to the discipline maintaining the anonymity of both the authors and the reviewers. Hence the journal policy would be to maintain a double-blind review. However, if the editorial committee/reviewers feel that the author(s) need help to develop the manuscripts, this will be accommodated through a separate panel of advisors of SLJHR.
2. The Manuscript Review Form contains a clear marking scheme to ensure uniform assessment of manuscripts, and the reviewers will be requested to give the reviewer decisions on the reviewed manuscript as 'Accepted without revisions', 'Minor revisions are required', 'Major revisions are required' and 'Rejected'.
3. The decisions on the further proceeding of the manuscript will be given based on the decision matrix of SLJHR shown. N.B. In case any editorial committee member wishes to discuss or inquire about any article, at any point, it is allowed. Articles for which the editorial committee or editors in chief thinks need special review will be sent to a third reviewer.
4. The comments and recommendations of the reviewers and editors will be communicated to the authors within one week of making the decision.
5. Authors are advised to fill up the table in due format addressing each comment of the reviewers and editors, and also advised highlighting the changes they have made to the manuscript following reviewer comments. Revised manuscripts will have to be submitted within 3 weeks of receiving manuscripts for revise.
6. Two reminders on the deadlines for resubmission will be sent to the corresponding authors after two weeks and three weeks of sending the manuscript revision notifications. If there is no response from them after three weeks of sending the manuscripts for revision and if the resubmission is delayed without any valid reason, these articles will be removed from the system of the SLJHR.
7. The revised articles submitted by the authors after addressing the reviewer comments will be re-sent to the same reviewers. If the reviewers are happy that the articles need no further revisions, those manuscripts will be discussed in the editorial committee meeting before being published. Once approved by the editorial committee for publication, the language and content will be improved by the editorial assistants and the language experts. The final manuscript for publication will be sent to the author by the editors in chief with the suggested final revisions, and once the author agrees to the final revisions, the manuscript will be published in the Sri Lanka Journal of Health Research.

Reviewer 1 \ Reviewer 2	Accepted without revisions	Minor revisions required	Major revisions required	Rejected
Accepted without revisions	Category-I Accepted and manuscript will be discussed at editorial committee meeting (EC) before informing authors.	Category-II Revisions required – Manuscript will be discussed at EC only if there are major concerns raised by reviewers/chief editors. Otherwise, chief editors send reviewer comments to authors without waiting for EC's decision.	Category-IV Revisions required – Manuscript will be discussed at EC only if there are major concerns raised by reviewers/chief editors. Otherwise, chief editors send reviewer comments to authors without waiting for EC's decision.	Category-VII Manuscript will be discussed in EC followed by a decision.
Minor revisions required	Category-II Revisions required – Manuscript will be discussed at EC only if there are major concerns raised by reviewers/chief editors. Otherwise, chief editors send reviewer comments to authors without waiting for EC's decision.	Category-III Revisions required – Manuscript will be discussed at EC only if there are major concerns raised by reviewers/chief editors. Otherwise, chief editors send reviewer comments to authors without waiting for EC's decision.	Category-V Revisions required – Manuscript will be discussed at EC only if there are major concerns raised by reviewers/chief editors. Otherwise, chief editors send reviewer comments to authors without waiting for EC's decision.	Category-VIII Manuscript will be discussed in EC followed by a decision.
Major revisions required	Category-IV Revisions required – Manuscript will be discussed at EC only if there are major concerns raised by reviewers/chief editors. Otherwise, chief editors send reviewer comments to authors without waiting for EC's decision.	Category-V Revisions required – Manuscript will be discussed at EC only if there are major concerns raised by reviewers/chief editors. Otherwise, chief editors send reviewer comments to authors without waiting for EC's decision.	Category-VI Manuscript will be discussed in EC followed by a decision.	Category-IX Manuscript will be discussed in EC followed by a decision.
Rejected	Category-VII Manuscript will be discussed in EC followed by a decision.	Category-VIII Manuscript will be discussed in EC followed by a decision.	Category- IX Manuscript will be discussed in EC followed by a decision.	Category-X Rejected. manuscript will not be discussed in EC and chief editors inform the decision to the author.

1. At the submission of any manuscript, the authors need to make a declaration that the manuscript is free from any conflicts of interest and ethical issues. When the authors have obtained ethics review approval from an Ethics Review Committee (ERC) accepted by the Ministry of Health Sri Lanka, it should be uploaded together with the manuscript. The administrative approval letters need also to be uploaded especially when the manuscript/research is related to the work carried out by the Ministry of Health Sri Lanka.
2. Based on the tools & guidelines developed by the National Health Services UK, available at the following links,
 - <http://www.hra-decisiontools.org.uk/ethics/>
 - <https://www.nsfh.nhs.uk/Get-involved/Documents/Is%20my%20Project%20Research%20Evaluation%20or%20Audit.pdf>
 - <http://www.salisbury.nhs.uk/InformationForPatients/Departments/Research/ResearchDocs/Documents/defining-research.pdf>The Editorial Committee may exempt the following types of articles from the need to have ERC approval:
 - Research involving secondary use of data (use of data initially collected for another purpose) when no form of identifier is involved. E.g., personal health records, employee records, student records, computer listings, banked tissue. If any form of identifier is involved and/or if private information of individuals is involved, ERC approval is necessary.
 - Quality assurance studies, program evaluation, audits, performance reviews, improvements of the health services which include activities normally administered in the ordinary course of operation in the Ministry of Health Sri Lanka which have been undertaken on the instructions of the Secretary of Health or with the approval of the Secretary of Health are exempted from ERC review. If data collected for such activities is later analysed for a research purpose, it could be considered secondary use of information not originally intended for research. However, if these endeavours include activities that are not normally administered in the ordinary course of operation in the Ministry of Health Sri Lanka and designed specifically to undertake the study in question, these need ERC approval.
 - Research about individuals in the public arena using only publicly available or accessible records without contact with the individual/s does not need ERC approval. However, research about a living individual in the public arena if s/he is to be interviewed and/or private papers accessed needs ERC approval.
 - Research that are involving naturalistic observation in public venues.
 - Research that is based on the review of published/ publicly reported literature.
3. All the other original research needs ERC approval. The ERC approval date has to precede the data collection of the study.

Important:

All authors are advised to read the following before they place their signatures on the last page of this document. Please check all applicable boxes and provide additional information as requested.

Title of the manuscript:

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01. Correspondence with the editorial office

The corresponding author declared on the title page of the manuscript is: [Insert name here.]

- This author submitted this manuscript using his/her account in the editorial submission system.
- We understand that this corresponding author is the sole contact for the editorial process (including the editorial submission system and direct communications with the office). He/she is responsible for communicating with the other authors about progress, submissions of revisions and final approval of the manuscript.
- We confirm that the email address shown below is accessible by the corresponding author, is the address to which corresponding author’s editorial submission system account is linked, and has been configured to accept email from the editorial office of Sri Lanka Journal of Health Research.
[Insert the email address you wish to use for communication with the SLJHR here.]

02. Conflicts of interest

- Potential conflict of interest exists:
We wish to draw the attention of the editor to the following facts, which may be considered as potential conflicts of interest: *[State the nature of the potential conflicts of interest below.]*
- No conflict of interest exists.
We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial or non-financial support for this work that could have influenced its outcome.

03. Funding

- Funding was received for this work.
All of the sources of funding for the work described in this publication are acknowledged below: *[List funding sources and their role in study design, data analysis, and result interpretation.]*
- No funding was received for this work.

04. Intellectual property

- We confirm that we have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, concerning intellectual property. In so doing we confirm that we have followed the regulations of our institutions concerning intellectual property.

05. Research ethics

- We further confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.
- Ethics review committee approval was obtained and administrative clearance has been obtained from the respective organizations.
- Written consent to publish potentially identifying information, such as details of the case and photographs, was obtained from the patient(s) or their legal guardian(s).

06. Authorship

The International Committee of Medical Journal Editors (ICMJE) recommends that authorship be based on the following four criteria:

- i) substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
- ii) drafting the work or revising it critically for important intellectual content; AND
- iii) final approval of the version to be published; AND
- iv) agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

All those designated as authors should meet all four criteria for authorship, and all who meet the four criteria should be identified as authors. For more information on authorship, please visit <http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html> too

- All listed authors meet the ICMJE criteria. We attest that all authors contributed significantly to the creation of this manuscript, each having fulfilled the criteria as established by the ICMJE.
- One or more listed authors do(es) not meet the ICMJE criteria.
- We believe these individuals should be listed as authors because: *[Please elaborate below.]*
- We confirm that the manuscript has been read and approved by all named authors.
- We confirm that the order of authors listed in the manuscript has been approved by all named authors.

07.

- We certify that the manuscript has not been published elsewhere nor submitted to another journal for consideration for publication. If the manuscript has been partly or fully published elsewhere, a full statement of all previous publications should be attached. This should include the presentations of abstracts made from the same original article/clinical audit or other publication types. Any such work should be referred to specifically and referenced in the new manuscript. Copies of such material should be included with the manuscript to help the editor assess the situation about the redundancy of the material to be published. Authors are also encouraged to submit any previous communications from other journal editors or reviewers if the manuscript has been previously submitted to another journal.

08.

- We certify that the manuscript will not be submitted to another journal for review until the final decision is reached by the editorial board of SLJHR. If the authors decide to withdraw the manuscript from review, it will be immediately notified through the online system.

09.

- If the manuscript is accepted for publication, we grant the Ministry of Health, Sri Lanka the authorization to publish the article and to identify itself as the original publisher. We have read the Copyright Notice in the Author Guidelines.

We the undersigned agree with all of the above.

Author's name (First, Last)	Signature	Date
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N.B. Please note that all authors need to put their signatures. E-signatures are acceptable. The corresponding author cannot sign on behalf of other authors.

Content in this inaugural issue

Messages from the Honorable Minister of Health and the officials of the Ministry of Health

Cover Story

One Team, One Heartbeat for One Goal

Editorial

A thriving health system with an evidence-based culture: The potential catalytic role of Sri Lanka Journal of Health Research

Perspectives

'This is how we did it', the strong voice of resilient people:
A paradigm shift for risk communication during fatigue phase of COVID-19 pandemic

Original Research

- Patient-centred interviewing in Outpatient Departments: A doctor-client perspective
- Comparative analysis of cultural competence of senior and junior nursing students
- Abundance, composition, peak active-period and vertical flight range of sand flies (Diptera: Psychodidae), the vector of leishmaniasis in Kurunegala district

Case Report

Coexistent dengue haemorrhagic fever and diabetic ketoacidosis: A therapeutic challenge

Brief Report

- Challenges related to information handling during the COVID-19 pandemic: Experience of a secondary care hospital in Sri Lanka
- Novelty in the sphere of health human resources in Sri Lanka

Update

Anopheles stephensi: The new challenge in the prevention of re-establishment of malaria in Sri Lanka

Picture Story

Accelerated COVID-19 vaccination for Sri Lankans

Instructions to authors: Sri Lanka Journal of Health Research

- Author guidelines
- Organization of the manuscript for original research
- Manuscript review flowchart
- Review process and the decision framework
- Ethics framework
- Author declaration



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