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SPECIAL ISSUE:

Ageing with Health and Dignity



Contents

In This Issue	1
<hr/>	
SPECIAL ISSUE EDITORIAL	
Ageing with Health and Dignity Peter P Yuen	3
<hr/>	
RESEARCH ARTICLE	
Treasure in Elderly Care Learning: A service-learning experience at a neighbourhood centre in Hong Kong Author(s): Roderick Fung, Ben Y.F Fong	5
<hr/>	
RESEARCH ARTICLE	
Community Ageing with Health and Dignity Through A Service-Learning Initiative Author(s): Hiu Lam Yee, Ben Y.F Fong, Tommy K.C NG, Billie S.M Chow	11
<hr/>	
ANALYSIS OF MANAGEMENT PRACTICE	
Improvement of Elderly Health Care Voucher Scheme in Hong Kong Author(s): Cheryl C.W Ho, Tommy K.C Ng	18
<hr/>	
RESEARCH ARTICLE	
Time Banking for Elderly in Hong Kong: Current practice and challenges Author(s): Tommy K. C. Ng, Noel T. S. Yim, Ben Y. F. Fong	23
<hr/>	
RESEARCH ARTICLE	
Medical Quality and Well-Being Perception of Senior Tourists Author(s): Pimtong Tavitiyaman, Wanlanai Saiprasert	30
<hr/>	
REVIEW ARTICLE	
Overview of Palliative Care Service in Hong Kong Author(s): Hilary H.L Yee, Ben Y.F Fong, Tommy K.C Ng	39
<hr/>	
VIEWPOINT ARTICLE	
Green Burial in Hong Kong Author(s): Cynthia S. Y. Lau, Hilary H. L. Yee, Tommy K. C. Ng, Ben Y. F. Fong	45
<hr/>	
RESEARCH ARTICLE	
The Deployment of Virtual Reality (VR) to Promote Green Burial Author(s): Yui Yip Lau, YM Tang, Ivy Chan, Adolf K.Y. Ng, Alan Leung	53
<hr/>	
RESEARCH ARTICLE	
Active Aging Management in Iran: Designing a model Author(s): Zeinab Gholipour, Mahmood Mahmoodi Majd Abadi Farahani, Leila Riahi, Kamran Hajinabi	61
<hr/>	
REVIEW ARTICLE	
Improvement of Safety in Operating Theatres by Training and Teamwork Author(s): Carina Y.H Lam, Tommy K.C Ng, Hilary H.L Yee	71

VIEWPOINT ARTICLE

Home Hygiene and Prevention of Infections

79

Author(s): Zoe F.Y Lai, Sukhpreet Kaur

VIEWPOINT ARTICLE

The Role and Responsibility of Clinical Pharmacists in Rheumatology Clinic: An exploratory study in Hong Kong **85**

Author(s): Shirley Wai Ying YIP, Gary Chung Hong Chong

REVIEW ARTICLE

Quality Management of Inpatient Medication Administration in Hong Kong Public Hospitals

91

Author(s): Kiu Yan Kwong, Ben Y.F Fong

RESEARCH ARTICLE

**Retrospective Evaluation on Patient Screening and Counselling Service on Direct-acting Antivirals
Against Hepatitis C**

99

Author(s): Bob Ka Him Wong, Gary Chung Hong Chong

IN THIS ISSUE

This special issue responds to publications arising from presentations at the 2020 CPCE Health Conference held in Hong Kong in January. The conference was conducted by the College of Professional and Continuing Education of the Hong Kong Polytechnic University in association with a number of organisations including the Centre for Ageing and Healthcare Management Research and our colleagues from the Hong Kong College of Health Service Executives.

The theme of the conference was 'Ageing with Health and Dignity – Implications for Public Policy, Service Delivery Workforce, Technology and Financing'.

A further general call was made by APJHM for this themed issue and we were pleased to accept an appropriate article from health management academic colleagues from Iran.

The editorial for this issue is appropriately provided by the Conference Chair, Professor Peter Yuen who is the Dean of CPCE at the Hong Kong Polytechnic University. The first article in this issue is provided by Fung and Fong from the School of Professional Development of the Hong Kong Polytechnic University. In a case study it describes 'service learning' as a useful learning activity for students to understand and analyse the health and social conditions of the elderly in a practical environment. The experience is described as 'Treasure in elderly care learning'.

In a similar context the second research article is provided by YLee, Fong, Ng and Chow. It is described as a community service-based learning initiative conducted in four selected elderly centres in Hong Kong. The students identified and improved skills and learned better ways to communicate with elders and to respond quickly to changes in designed activities to elders. In the next article Ho and Ng describe the 'improvement of the elderly health voucher scheme in Hong Kong. The scheme provides

financial support by the government to the elderly for having more choices in selecting private primary health care services. The scheme is described as having a high participation rate, yet the amount of the subsidy is not sufficient to meet the needs of the elderly. The study suggests a need for increased funding and improved standards of monitoring the performance of service providers.

In our fourth article Ng, Yim and Fong describe a system to reduce the burden of the ageing population through 'time banking'. This is described as an approach to maximise social capital through exchanging one's time to serve others that can be saved as a credit to use later when requiring services. The review article suggests that further time is required for governmental, technical, and educational support. In our next article Tavitiyaman, from the Hong Kong Polytechnic University and Saiprasert from the Chiang Mai University Thailand. This research describes the medical quality and wellbeing perceptions of senior tourists in their quest for healthcare in other countries.

Yee, Fong and Ng in our next article provide a descriptive overview of palliative care services in Hong Kong. They then suggest that guidelines are required with criteria to screen patients for palliative care needs in advance. They suggest that professional education and training be expanded as well as the need to improve public knowledge and education. They also suggest increased funding on palliative care as well as the need for further research.

The next two articles relate to the concept of 'green burials.' The first article by Lau, Yee, Ng and Fong describes the context of decreasing space and capacity for traditional funerals much favoured in Chinese cultural contexts and a lack of readiness to adopt the concept of green burials. They provide the context and challenges in attempts to promote more and better use of this concept.

The second of these two articles Lau, Tang, Chan, Ng and Leung in an approach that is attempting to utilise the deployment of virtual reality to promote the concept of 'green burial.' The authors ask the questions about the potential of this technology to debunk current community perceptions and change the community acceptance of this practice.

In our next article health management colleagues from Iran present an article on 'active ageing management: designing a model'. The article by Gholipour, Abadi Farahani, Riahi and Hajinabi suggest that active ageing practices have not received sufficient attention in Iran. Their research seeks to identify factors that might substantiate a policy model to address and improve public policy around active ageing.

Lam, Ng and Yee provide our next article on the improvement of safety in operating theatres by training and teamwork. They suggest a management plan that focusses on human resources, professional training and retention of staff and teamwork. Lai and Kaur from the Hong Kong College of Community Health Practitioners next provide a timely article on home hygiene and the prevention of infections reminding the readers that proper practices lead to the reduction of infectious diseases. Yip and Chong provide an explanatory study on the role and responsibility of clinical pharmacists in a rheumatology clinic. Arthritis is a leading chronic disorder amongst older people. The research aim was to improve patient medication adherence and enhance medication safety. Kwong and Fong continue this theme in the next article on the quality management of inpatient medical administration in Hong Kong public hospitals. They suggest that the elimination of potential risks arising from prescribing, dispensing and drug administration processes brings the achievement of medication safety. Wong and Chong provide our final research article providing a retrospective evaluation on patient screening and counselling service on direct-acting antivirals against hepatitis C.

The APJHM appreciates the contributions of our authors and of the organisers of the conference in the submission and acceptance of these articles.

DS Briggs AM
Chief Editor

AGEING WITH HEALTH AND DIGNITY

Peter P. Yuen, Special Issue Editor



I am grateful to be given the opportunity to write this Editorial. As mentioned by Dr. Briggs's introduction ("In this Issue"), the articles in this Special Issue were selected from papers presented to the CPCE Health Conference 2020 in Hong Kong. The 2020 Conference is the fifth consecutive annual conference organized by the College of Professional and Continuing Education (CPCE) of The Hong Kong Polytechnic University, supported by many partner institutions, including the Australasian College of Health Services Management and the APJHM.

The 2020 Conference, with the theme "Ageing with Health and Dignity: Implications for Public Policy, Service Delivery, Workforce, Technology and Financing", aims to address the problems associated with the ubiquitous and sustaining nature of population ageing from different angles in the Asia Pacific region. Many countries in this region are experiencing a high speed-high-speed ageing process in the coming few decades. While most countries in this part of the world have long life expectancies and a relatively high per capita GDP, we know well that many of our elderly residents do not age with health and dignity. For example, in Hong Kong, waiting time in public hospitals for the diagnosis and treatment of some chronic conditions are measured in years. Many elderly persons have no choice but to accept the pain, discomfort and poor quality of life during the long wait (Yuen 2014). Close to 7% of the elderly population in Hong Kong are institutionalized in nursing homes, which is double/triple the rate of many of other countries (Chiu 2009). Many of these nursing homes are of questionable quality. Over 90% of all deaths in Hong Kong occur in public hospitals, with conditions that are not suitable for the terminally ill – shortage of staff, crowded environment, and very restrictive visiting hours. Over 40,000 people die in these conditions every year, many of whom

endure extraordinary suffering in their final days of life which is totally unacceptable (Woo et al 2018). Hong Kong definitely has a long way to go in terms of ageing with health and dignity.

Contributors to this Special Issue attempt to provide solutions through tackling problems in different domains at the different phases of a person's lifecycle, including the education and involvement of the younger generation on ageing issues, promoting active lifestyle and a healthy living environment for the well elderly, early disease detection, the adoption of safer practices in hospitals and in drug administration, innovative long term care delivery, better palliative care and the wider adoption of green burial rituals.

The Conference was held on 13 January 2020. COVID-19 was then still perceived by most as a local problem in Wuhan. While the Conference did not focus on the pandemic itself, the emphasis on the elderly and the measures proposed are not irrelevant. The weaknesses of most health and long-term care systems are now acutely exposed by the pandemic. From the few months of the pandemic, it is clear that the elderly suffered most. Poor general health status of many elderly made them more vulnerable when infected. The overall death rate from COVID-19 for persons aged over 80 is 7.8% as compared with the death rate of the general population of 0.66% (Verity et al 2020). The over-reliance on hospitals for services has left many with chronic conditions without care for months. In Hong Kong, more than 10,000 patients every day had to have their services postponed. Follow-up appointments of more than half of their patients had also been delayed. (Zhang 2020). There were some serious outbreaks in long term care institutions in some countries. One study in the USA shows deaths from COVID-19 in nursing homes account for more than half of all fatalities in the 14 states that were being studied. In another study, it shows that in New Hampshire, 72% of deaths have been nursing home residents (Glenza 2020). With visitors banned

in order to control the spread of the virus, almost all dying patients died in isolation, away from their loved ones, without receiving the more dignified end-of-life care.

The findings and recommendations by the authors in this Special Issue should provide insights for policy makers, care providers, and managers for reform after the pandemic. While each jurisdiction must design its own policies and systems based on its unique socio-political-economical context, enabling the population to age in health and dignity should still be the priority common goal for all to strive for.

Peter P. Yuen,
Special Issue Editor and
Dean of the College of Professional & Continuing
Education, The Hong Kong Polytechnic University, Hong
Kong.

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TREASURE IN ELDERLY CARE LEARNING: A SERVICE-LEARNING EXPERIENCE AT A NEIGHBORHOOD CENTRE IN HONG KONG

Roderick C. H. Fung¹, Ben Y. F. Fong¹

1. School of Professional Education and Executive Development, The Hong Kong Polytechnic University, Hong Kong

Correspondence: dad709394@gmail.com

ABSTRACT

Service-learning is a useful learning activity for students to understand and analyse the health and social conditions of elderly recipients. It offers a practical environment for the study of ageing. Students make the service-learning meaningful, by combining the course idea and concepts in the activity during service. Students enhance learning experience by finding an appropriate health suggestion to the elderly while investigating the health conditions of the elderly. Students enrich additional vision by designing effective activities for the elderly and explaining the course idea to the elderly. The elderly provide opinion in the activity and inspire students to have a better management for further life and service-learning. In this study, an experience of service learning in elderly home is described. It covers several themes: (a) preparation of service learning, (b) analysis of designed activities, (c) reflection on this service-learning, (d) comparison of in-class learning and service-learning.

KEYWORDS

service-learning, students, elderlies, community elderly centre, site services, communication, teamwork, challenges

INTRODUCTION

Critical thinking and effective learning are always accepted as the essential elements in the learning process. In Hong Kong, the education system is very much a "spoon-

fed" and 'cramming' education approach. Teachers always inculcate the teaching materials to the students as the major and common teaching modality. Under such a "normal" direction and practice, the students must memorize all the notes for the internal and open examinations in primary and secondary schools. In tertiary education, some teaching institutions have adopted service-learning in the subjects offered to undergraduates. This innovative teaching and learning module may stimulate critical thinking and effective learning among the students. In recent years, service-learning has become an initiative teaching module instead of the convention in-class learning approach for some subjects at universities in Hong Kong. Community centres and institutions are used as learning venues and hubs for students to serve selective recipients in or near their living environment. In this study, an experience of service learning in an elderly home is described with the coverage of the preparation of service learning, analysis of designed activities, reflection on this service-learning and comparison of in-class learning and service-learning.

WHAT IS SERVICE LEARNING

Service-learning is classified as education through experiential learning. It combines the community service and academic study into one process. It also provides some specific and designated learning outcomes for students to achieve. Students increase the learning experience from the reflections. To maintain good service-learning, it must include three elements: application of academic knowledge and skill, collaboration with the organization to carry the community service, and reflection

on each session. [1] Therefore, service-learning is a complicated learning system as learning and service-providing must be processed simultaneously. To complete the learning outcomes, service-learning includes four stages: investigation and preparation, action, reflection, and demonstration. [2] Through the four stages, students will have a clear mind about the services and follow the steps to attain the performance and outcomes.

CASE OF A NEW SERVICE-LEARNING SUBJECT

A new service-learning module was introduced as a compulsory subject, Practices in Health Promotion, in the year 1 study of the top-up undergraduate programme in Health Studies (HS) by the School of Professional Education and Executive Education (SPEED) at The Hong Kong Polytechnic University in 2019.

STUDENT PARTICIPATION

A total 36 students were admitted to the HS and hence the same number of students took the new service-learning subject. The class was divided into four groups, of 8 to 12 students, and each group was assigned to one community elderly centre under the management of Sik Sik Yuen, a prestigious religious non-government organisation (NGO) with a long history in Hong Kong. Two groups were carrying out home visits predominantly as the service. The remaining groups were serving the elderly recipients at the premises of the centres. One of these two latter groups was invited to be involved in the "Dementia Community Support Scheme", a new joint initiative of the Social Welfare Department and the Hospital Authority, to serve senior citizens who were known to suffer from mild dementia. This paper reports the experience of service-learning activities carried out by one of the groups, of 12 students, at a centre, which incidentally was situated within walking distance of one of the campuses of SPEED.

INVESTIGATION AND PREPARATION

The senior management of Sik Sik Yuen was very supportive to this project. Four centres were selected to accommodate the students during the ten weeks of service. The course content (Appendix A) was presented to them and the heads of the four centres. Six University teachers were appointed site supervisors, who met and discussed with the respective centre in-charge and staff to work out the scope and implementation issues of the

services and the detailed logistics of site services by the students. Some site-specific adjustments were made to the arrangements and contents as a result of the situations and circumstances surrounding the centre venue, personal life of recipients and carers, progress of site delivery at individual centres. Site Supervisors shall make appropriate arrangements as they see fit, in consultation with centre-in-charge and the subject lecturer.

Before the service-learning, all students attended three lectures on health promotion. These classes covered some fundamental concepts and theories about the subject. Student needed to acquire the academic knowledge before applying the theory and skills in the services. On the first day of service, the twelve students were separated into six groups of two people. Each group needed to investigate the needs of recipients (Appendix B).

The first task then was to build up a friendly relationship with the senior citizens, but there was an obvious generation gap between the students and the elderly. A communication strategy was applied. Mikelić Preradović [2] has stated that language skills are required to decline such as the vocabulary and repetition should be adjusted to suit the elderly. Williams, Kemper and Hummert [3] believe that the Communication Enhancement Model can promote effective communication and decrease the use of elderspeak. This model suggests that an active understanding of the factors influencing the health conditions of the elderly must be applied by the provider. [4]

By using the communication strategy and model, it helped to have an in-depth understanding of the target recipients. Then the students could choose appropriate vocabulary and language skills for the elderly recipient. They also built up a relationship with each other and fostered communication. At the same time, students formulated the type of questions for the elderly because some health issues might touch on personal privacy during the needs assessment consultation. For example, it is difficult to ask the question like 'regular medication' and 'mental status' at the first encounter. it was also an embarrassing question-asking style for the students to handle.

Once the results were collected, student would suggest some approaches and provide health information to the elderly. Most of the recipients were found to be suffering from a sleeping disorder, having a 'yum cha' (Cantonese breakfast) habit and bothering with negative thinking of

"no one cares about them". Diet can affect sleeping quality. For instance, a carbohydrate diet will increase the blood sugar level rapidly and the body releases insulin to lower the blood level by the physiological mechanism. This hormone-releasing can obstruct sleep. 'Yum cha' includes different types of dishes, called "Dim Sim", rich in carbohydrates. To address these problems, three types of activities were designed by the students, including interacting activities, informative sessions, and role-playing games, which had drawn the attention of the recipients and enhanced the effectiveness of health promotion.

ACTIONS AND DEMONSTRATION AT THE CENTRE

HEALTH SEMINARS – INFORMATION SESSIONS

The structured health seminar mainly talked about essential knowledge and provided direct information to the recipients concerning about their health and habits. In each topic, the student presenter would analyse the causes and impact of health conditions because accurate health knowledge might arouse the attention of the elderly and motivate the recipients to undergo behavioural change. To illustrate, the seminars covered talks about the nutrition values of the variety of the dim sum. The recipients were willing to change their habits to more healthy eating when they learned the health knowledge from the information sessions.

GAMING AND EXERCISE – INTERACTING ACTIVITIES

Interacting activities like gaming and exercise attract the attention of the audience through participation. Gaming can build up an entertaining ambiance and thus decrease boredom. Through the group game, it can also eliminate the generation barrier and increase friendship. An exercise is a practical approach to health promotion. In the design of exercise, students had considered the physical ability and strength of the elderly. It would be hard to the elderly recipients to perform complicated workout because of the weak and degenerative body conditions. Simple exercise was appropriate for the elderly as they are vulnerable. In the tutorial of exercise, the student instructor had mentioned the benefits of each exercise, particularly arising from the variation of exercise. These activities were welcome and highly appreciated by the recipients.

ROLE PLAYING GAMES

Before the role-play session, students examined the present-day elderly's situation and would contribute empathy to the recipients in the acting. Through the played

role of cast as an elderly, performing students could feel about the conditions of the elderly. In the role-playing game session, a condition of loneliness and isolation about the elderly individual was cast. This could increase the awareness among the students about elderly care. In general, most elderly individuals lacked family caring as family members put much time into other activities.

SUPERVISION

Guidance and assistance were provided by site supervisors. During the service, site supervisors assisted the students to develop their ability in applying principles and concepts of health behaviour which motivate individuals to adopt a healthy lifestyle. Although all formal assessments were to be done by site supervisors, centre supervisors also provided advice to students, and feedback to subject lecturer and site supervisors during the service duration. More specifically, the progress and general health status of recipients would be communicated to the students for them to understand the impact of the services being provided.

REFLECTION AND DISCUSSION

In this service-learning module, students learned a lot of social skills and team skills in health promotion. Although there were limitations, team skills were employed to solve the predicament. For example, in the exercise activity it was hard to talk about the benefits and demonstrate the exercise simultaneously. To resolve this issue, a student demonstrator was assigned to provide better understanding of the exercise. The service-learning subject also offered a practical learning chance for the students through the application of the course content in the service, using the core idea acquired in the course. [5] By applying the idea, the students might need to consider the variable factors and the effectiveness of the promotion approach. After all, service-learning is an experiential education circumstance for students to have practical learning and to promote their learning experience. A discussion meeting for all the students and supervisors was held during mid-way of the site services to share the experience, issue of concern or interest, difficulties, and interesting or memorable encounters, as well as comments on the subject. In addition, individual students submitted two reflective journals as part of the course assessment in addition to group projects.

COMPARISON OF IN-CLASS LEARNING AND SERVICE-LEARNING

In in-class learning, the teacher plays a significant role in teaching. During the class, no student will interrupt the teacher even when the student has a question. Students can only ask question either permitted by the teacher or after the class. The role of a teacher is like a driver who manages the class as his/her desires. [6] Teachers have the decision on the teaching module and dictate the teaching materials for the students. In addition, the classroom is another important factor in in-class learning. The classroom generally is equipped for simple teaching performance, but it is not effective in sessions such as 'the health promotion on elderly' conducted at the community centre.

In in-service-learning, a further working circumstance is provided. Students can think about the combination of the venue environment and equipment to maximize the effectiveness of activities. Students will contribute a lot of time to the task preparation and to design appropriate activities for the elderly to realise the course idea. Unlike in-class learning, service-learning is creative and much more interesting in learning because the student can test and prove their ability in the activity design and leading the show. However, service-learning involves different types of tasks for the students such as preparation, action, reflection, and demonstration. As a result, service-learning is an experiential education for students to obtain knowledge via a service practice.

Under a practical learning place, students can be more familiar with the place of their future working field. However, students need to get familiar with the learning module and apply the academic study effectively in service-learning outside their usual campus environment. It can potentially become a complicated learning condition for students, resulting in extra demand, efforts and even stress. Under such challenging teaching and learning arrangement, students must overcome the difficulties independently among themselves, even though the teacher supervisor will provide professional advice and guidance.

CONCLUSION

Service-learning is a learning practice that helps the students to link the course knowledge into the community. It has been demonstrated that students and the elderly can learn from each other in the site service at the

community centre. The elderly is also a treasure to students because they share their precious life experience with the students. From the experience, students learn the skills in a life lesson while the elderly can increase the knowledge about health. Service-learning becomes a knowledge-exchange platform for the participants and recipients, and vice versa. Furthermore, the project has increased the students' awareness and understanding of the conditions in the community and provides them a sustainable education to develop their critical thinking.

ACKNOWLEDGEMENT

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APPENDIX A: COURSE CONTENT

Course content

Week	Contents	Schedule
#Weeks 1 – 4	Learning on relevant health promotion concepts/models and service skills.	3 hours on Saturdays (7, 21 & 28/9/2019) at PolyU Hung Hom Bay Campus (HHB)
Week 5	Briefing by centre supervisor, and social meeting recipients and carer/family. Relationship building: games and demonstrations.	Visit 1 101A* - Thur, 3/10/2019 101B* - Fri, 4/10/2019 101C* & D* - Sat, 5/10/2019
Week 6	Needs assessment: baseline questionnaire, and discussion of common health concepts with recipients and carer/family.	Visit 2 101A - Thur, 10/10/2019 101B - Fri, 11/10/2019 101C & D - Sat, 12/10/2019
Week 7	Baseline health assessment, and reinforcement of common health concepts with recipients and carer/family.	Visit 3 101A - Thur, 17/10/2019 101B - Fri, 18/10/2019 101C & D - Sat, 19/10/2019
Week 8	Talk on general health knowledge and attitude, and addressing individual's needs, followed by discussions.	Visit 4 101A - Thur, 24/10/2019 101B - Fri, 25/10/2019 101C & D - Sat, 26/10/2019
Week 9	Advice and demonstration on nutrition and eating patterns: games.	Visit 5 101A - Thur, 31/10/2019 Fri, 1/11/2019 101C & D - Sat, 2/11/2019
Week 10	Physical exercise, engaging the recipients and carers/families.	Visit 6 101A - Thur, 7/11/2019 101B - Fri, 8/11/2019 101C & D - Sat, 9/11/2019
Week 11	Role play on psychosocial needs addressing issues of anxiety, depression, stress, sleep, leisure, and social support.	Visit 7 101A - Thur, 14/11/2019 101B - Fri, 15/11/2019 101C & D - Sat, 16/11/2019
Week 12	Practical advice on pain management, medication compliance, alcohol use, and smoking cessation.	Visit 8 101A - Thur, 21/11/2019 101B - Fri, 22/11/2019 101C & D - Sat, 23/11/2019
Week 13	End-of-project follow-up health assessment. Each recipient will receive a souvenir card, with information of assessment and health advice, designed and prepared by the students.	Visit 9 101A - Thur, 28/11/2019 101B - Fri, 29/11/2019 101C & D - Sat, 30/11/2019

*101A, B, C and D are group labels. #Week 2 was a public holiday.



SEHS4669 Practices in Health Promotion

Semester 1, 2019/20

NEEDS ASSESSMENT

(This template serves as a guide to what should be covered in the Need Assessment in Week 6 and at the end of the Project. Reports of the two assessments can be completed separately or as a combined report of the two assessments. One report will cover on recipient. These Assessment reports are counted as part of the Service Performance Assessment. Please submit the reports via Moodle in the pdf format.)

Name of Recipient:

Name of Student(s):

Group and Name of Centre: Group 101

1. General health knowledge and attitude
2. Self-care routines and Helpers / Carers
3. Regular medications
4. Drug compliance
5. Alcohol use
6. Smoking history
7. Nutrition status and Eating pattern
8. Physical exercise and Mobility
9. Mental status: anxiety, depression, stress, sleep
10. Pain and Management
11. Social and psychological support
12. Utilisation of health services
13. Health assessment
 - blood pressure
 - pulse rate
 - height
 - body weight
 - Body Mass Index (BMI)
 - waist-to-hip ratio
 - gait
14. Other remarks or comments

COMMUNITY AGEING WITH HEALTH AND DIGNITY THROUGH A SERVICE-LEARNING INITIATIVE

Hilary H. L. YEE¹, Ben Y. F. FONG², Tommy K. C. NG¹, Billie S. M. CHOW²

1. School of Professional Education and Executive Development, The Hong Kong Polytechnic University

2. College of Professional and Continuing Education, The Hong Kong Polytechnic University

Correspondence: hilary.yee@speed-polyu.edu.hk

ABSTRACT

BACKGROUND

A new compulsory service-learning subject was introduced in the Practices of Health Promotion module of Bachelor of Science in Applied Sciences (Health Studies), run by the School of Professional Education and Executive Development, The Hong Kong Polytechnic University. It aims to develop students' ability to apply learned principles and concepts of health behaviour from lectures into a community setting, by completing elderly site services arranged at four selected elderly centres.

METHODS

36 students were enrolled in the subject. An analytical framework was developed based on specific themes, sub-categories and categories. Data extracted from students' reflective journals were put into qualitative analysis software, Qualitative Data Analysis (QDA) Miner 5 of Provalis Prosuite for analysis.

RESULTS

5 themes and 24 categories were created based on the data analysed from students' reflective journals. The three highest frequency themes are 'Skills learned' (170 text units, 32.6% of total), 'Challenges' (140 text units, 26.8% of total), and 'Elders characteristics' (135 text units, 25.9% of total).

CONCLUSIONS

Communication, teamwork and organising activities to the elderly are the most cited skills learned by students. They have also identified elders' personality and characteristic

when communicating with them. Although there were challenges when interacting with the recipients and centres, students have overcome most of them and have learned better ways to communicate with elders and reacted quickly by changing the content of designed activities provided to elders.

KEYWORDS

service-learning; students; elderlies; site services; communication; teamwork; challenges

INTRODUCTION

Service-learning (SL) is 'a philosophy, pedagogy, and model for community development that is used as an instructional strategy to meet learning goals and/or content standards'. [1] It is becoming more popular in education curriculum as it provides an opportunity for learners to apply their acquired academic knowledge and skills into a real-world situation by providing services in a community setting. It does not only help learners to explore their roles and civic responsibility as citizens, but to also benefit the community.

Many studies on SL have shown positive outcomes on different personal development aspects, including improved skills on critical thinking, problem solving, communication, enhanced sense of social responsibility and a deeper understanding of learning concept. [2,3,4] Academically, participation in SL has been found to be a predictor of university graduation rates as SL enhances

academic challenge and improves student's time-management skills which in turn motivates students to persist in their degree, leading to academic success. [5] Comparing students who are enrolled in SL and non-SL module, the former group engages more in collaborative learning with other students and faculty which further strengthens student's academic growth and assists them to reach graduation.

Due to the proven positive outcomes of SL and its wider application in education curriculum, a compulsory SL subject was introduced in the Practices of Health Promotion module of Bachelor of Science in Applied Sciences (Health Studies) by the School of Professional Education and Executive Development (SPEED), The Hong Kong Polytechnic University in 2019. It aims to develop ability of the students to apply principles and concepts of health behaviour to motivate elderly to adopt a healthy lifestyle, and to develop a sense of empathy, social responsibility and professionalism. In the SL subject, 36 students undertook nine weeks of compulsory site services

at four selected elderly centres under the guidance of site supervisors.

In order to examine the learning outcomes of this new SL subject and whether the intended learning objectives have been met, a qualitative analysis was conducted on the individual reflective journals from students. The results indicate that students have learned different skills and overcome most of the challenges when communicating with the elderly. Overall, the main objectives are fulfilled, and students have learned from serving the elderly on how to promote health with dignity in a community setting.

METHOD

PARTICIPANTS

A total of 36 students were enrolled in the SL subject. They were divided into four groups, Group A, B, C and D, and visited four designated elderly centres. The service content is shown in Table 1.

TABLE 1. SERVICE CONTENTS OF THE SERVICE GROUP

GROUP	NUMBER OF STUDENTS	TARGET SERVICE RECIPIENTS	CONTENTS
A	8	Elderlies in Ho Chui District Community Centre	Dementia Community Support Scheme
B	8	Elderlies living in Sau Mau Ping public housing estate	Home visits
C	12	Elderlies in Ho Wong Neighbourhood Centre for Senior Citizens	Centre activities
D	8	Elderlies living in Chak On Estate	Home visits

CONSTRUCTION OF ANALYTICAL FRAMEWORK

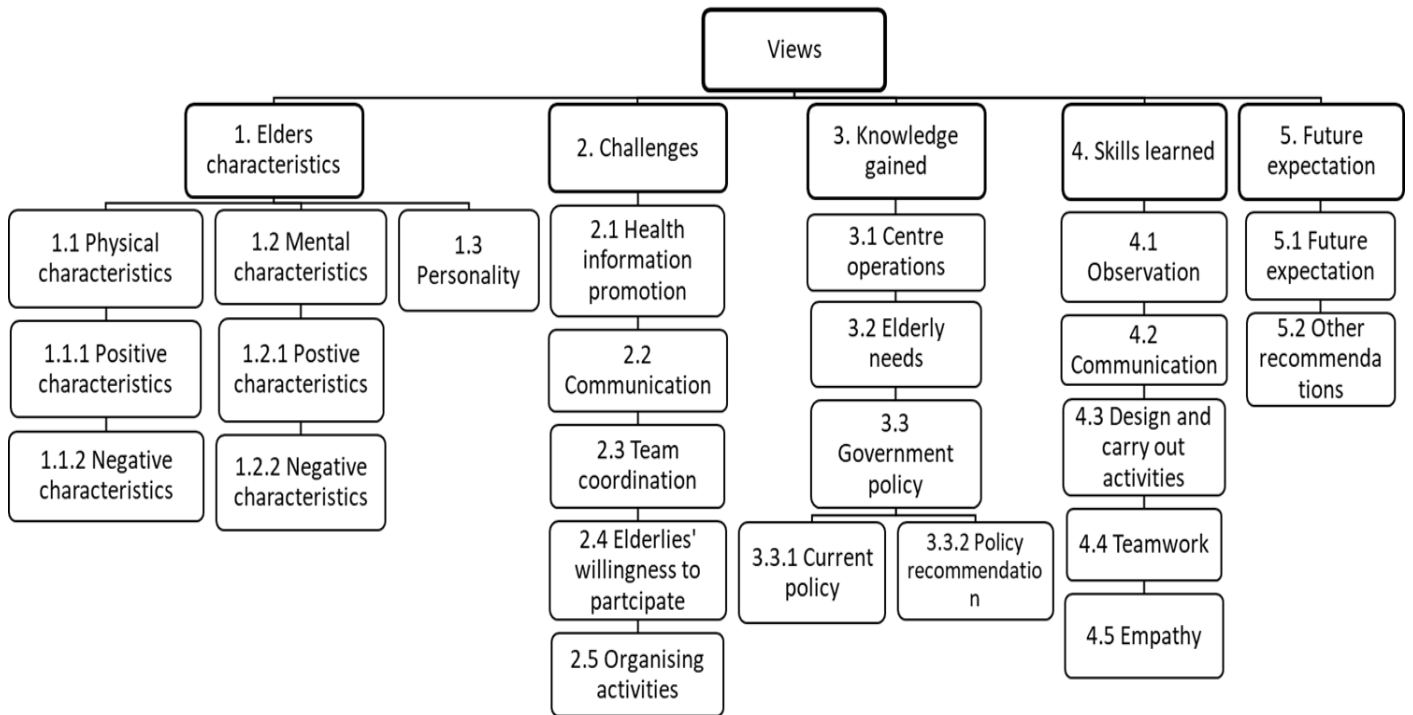
Based on the Grounded Theory approach [6], an analytical framework was developed in the current study, derived from the content analysis of the reflective journals written by the 36 students. 'Text Units' were identified in the content as phrases and sentences that represented the main points of views. 'Categories' were then generated by grouping text units with similar meaning. Some categories were subdivided into 'Sub-categories'. 'Themes' were created by grouping 'Categories' with similar meaning and an analytical framework for the current study was formed.

Figure 1 shows a detailed hierarchy chart of the relations between themes, categories and sub-categories of views collected.

DATA ANALYSIS

Data collected from students' reflective journals was inputted into a qualitative analysis software, Qualitative Data Analysis (QDA) Miner 5 of Provalis Prosuite for analysis. Based on the coded data according to specific themes, sub-categories and categories of the analytical framework, total frequency counts of text units and percentage of total number were calculated.

FIGURE 1. HIERARCHY CHART FOR ANALYSIS OF VIEWS COLLECTED



RESULTS

Analytical framework for qualitative views – the Themes
 The views were grouped under 5 themes and 24 categories based on the analytical framework. The 5 themes and their associated frequency counts in terms of text units totalling 522 are shown in Figure 2. The top three themes are Theme

4 'skills learned' (170 text units, 32.6% of total), Theme 2 'challenges' (140 text units, 26.8% of total), and Theme 1 'elders characteristics' (135 text units, 25.9% of total).

Top 6 categories of views

The frequency counts in terms of 'text units' of the top 6 categories of views are shown in Table 2 and presented in Figure 3.

FIGURE 2. THEMES OF VIEWS IN DESCENDING ORDER

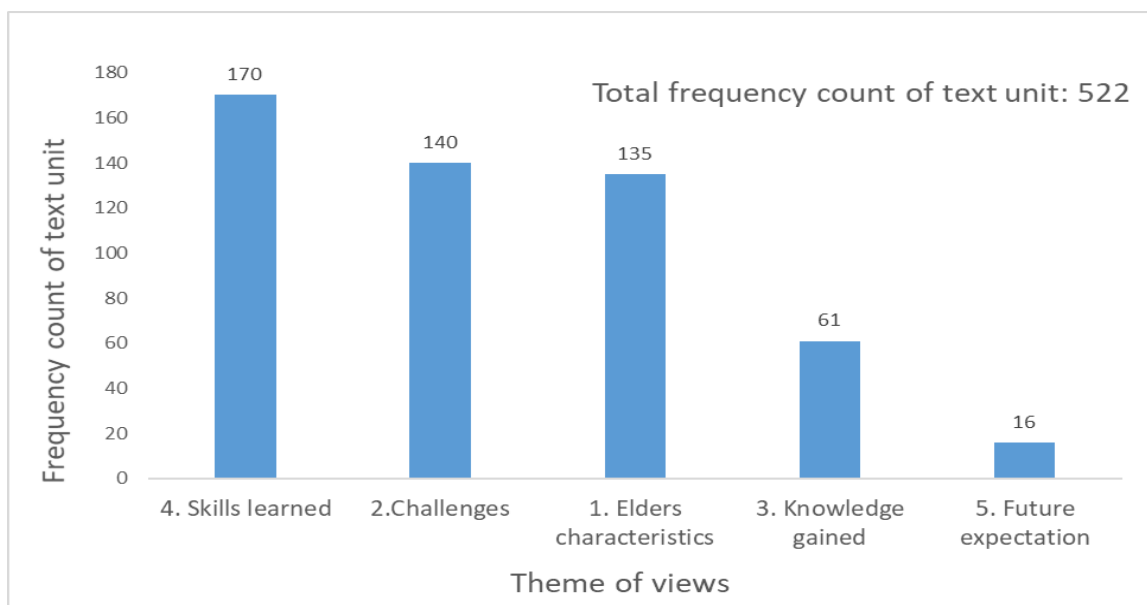
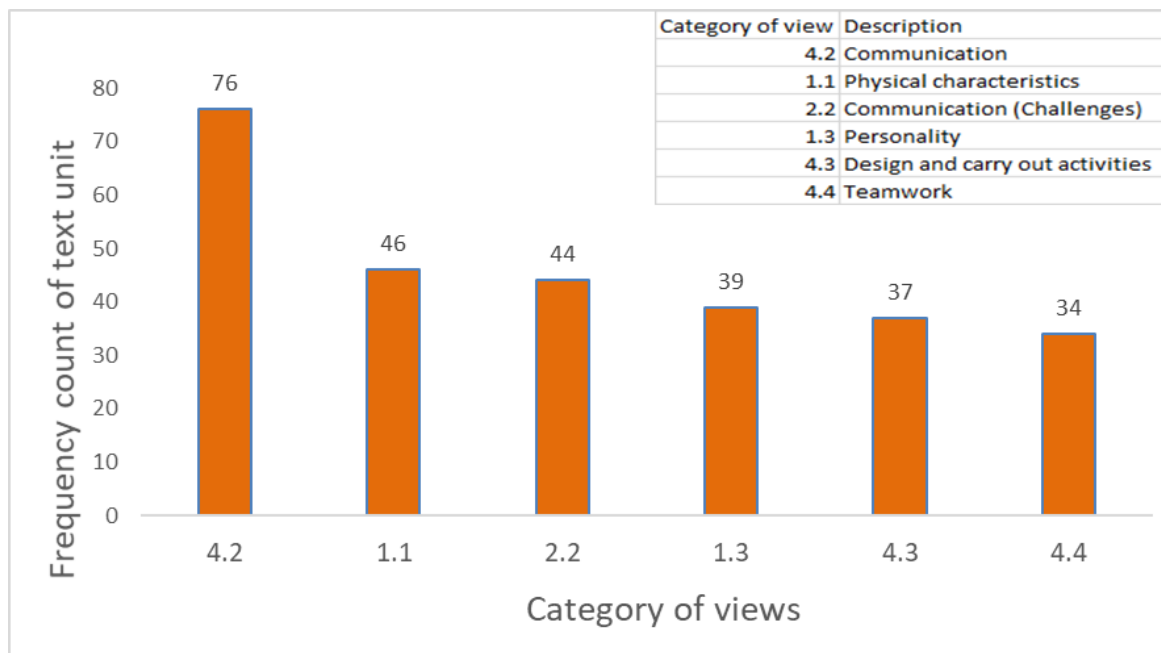


TABLE 2. TOP 6 CATEGORIES OF VIEWS IN DESCENDING ORDER

ITEM	CATEGORY OF VIEWS (ASSOCIATED THEME)	FREQUENCY COUNT OF TEXT UNITS	PERCENTAGE OF TOTAL NUMBER
1	4.2 Communication (4. Skills learned)	76	15.4%
2	1.1 Physical characteristics (1. Elders characteristics)	46	8.5%
3	2.2 Communication (2. Challenges)	44	8.9%
4	1.3 Personality (1. Elders characteristics)	39	7.9%
5	4.3 Design and carry out activities (4. Skills learned)	37	7.5%
6	4.4 Teamwork (4. Skills learned)	34	6.9%

*Remark: The frequency counts of text units with 30 above are shown in Table 2.

FIGURE 3. BAR CHART SHOWING TOP 6 CATEGORIES OF VIEWS IN DESCENDING ORDER



SUMMARY OF VIEWS

This section presents the summary of views expressed based on the significant points identified in each theme and category of view.

SUMMARY OF THEME 1: ELDERS CHARACTERISTICS

1a This theme has the third highest frequency count among the 5 themes. Under the category of 'elders characteristics', students clearly identified the characteristics of the elders that they encountered. Under 'physical characteristics', most identified views were on 'negative physical characteristics' from elders such as heart disease, high blood pressure, and knee and back pain. Under 'Mental characteristics', students from group A, who served demented elders, identified symptoms of dementia such as memory loss and difficulty in analysis as 'Negative mental characteristics'.

1b Under 'personality', a lot of students identified positive personality of elders such as being friendly, kind and talkative. Most elders were happy to communicate with the students.

SUMMARY OF THEME 2: CHALLENGES

2a This theme has the second highest frequency count among the 5 themes. Under 'communication', which is the third highest frequency count in category of views, most students pointed out that they were a lack of experience communicating with elders, causing difficulty in starting a conversation. Some of them were nervous to talk with the elders while some felt hard to find a common topic to discuss due to generation gap. Two of them also mentioned having language barrier as the elders spoke other Chinese dialects.

2b Students pointed out that a few elders were not too willing to engage in conversations or activities under category 'Elderly willingness to participate'. A few of the elders preferred not to expose their personal information while a few did not want to do physical exercises. However, it was mentioned that situation had improved after encouraging the elders to participate and changing the way of communication with them such as showing appreciation, using eye contact and body touch (also refer to point 4a).

2c Under 'organising activities', students from group A had discovered that some activities made elders felt tired and hard to follow the instructions, while group C had once miscommunicated with the Centre and faced with technical problems, resulting in carrying out the activity without the PowerPoint presentation. Moreover, two students on home visits had to change their original plan to doing stress test with the elders.

SUMMARY OF THEME 3: KNOWLEDGE GAINED

3a Under 'Current policy', some students wrote about the current supports to elders given by the government, such as enhancing community care services, providing healthcare vouchers and giving grant to community centres to provide elderly services. Recommendations included to increase the numbers of healthcare workers, to provide more funding to organisations that support elders and to set up retirement protection.

3b Under 'centre operation', a few students from groups A and C pointed out they had learned about the daily operations and services such as physical and mental supports provided by the community centres.

SUMMARY OF THEME 4: SKILLS LEARNED

4a This is the theme with the highest frequency count among the 6 themes, and 'communication' has the highest frequency count among the 24 categories. Improved communication skills were frequently mentioned by students. They identified the problems they had encountered when first communicating with the elders and learned how to improve that communication. Most students mentioned they had learned to be good listeners, 'be patient and talk slowly with gentle tone'. Some of the students had learned to open and continue conversations by introducing more about themselves and showing appreciation. A few of them had shown attentiveness and made use of non-verbal communication skills such as suitable body touch, eye contact and facial expression. They also wrote about avoiding talking about politics, privacy and personal information, or speaking English in between sentences.

4b Under 'design and carry out activities', students mentioned the need to consider the elders' ability. Hence, they had to set the content of the activities to be meaningful and joyful. Some students reflected the need to guide and assist the elders carefully during the activities

by better preparation. Safety consideration was also pointed out by students mainly from groups A and C.

4c Under 'Teamwork', the importance of teamwork was mostly mentioned by students from group A and C. They identified how to cooperate and help with each other in conducting and solving problems during activities.

4d Under 'empathy', although the frequency count of this category was less than others, 11 students talked about demonstrating empathy towards the elderly when communicating with them. Three of them mentioned that they had learned to show empathy by understanding elders' health conditions and concerns.

SUMMARY OF THEME 5: FUTURE EXPECTATION

5a Under 'future expectation', some students expected they would do better in the coming services. Expectations included promoting more health information, organising more meaningful activities and improving problems encountered. One student recommended to conduct home visits in other low-income areas.

DISCUSSION

The intended learning objectives of the SL subject in this study include equipping students with the knowledge of health promotion methods and theories in different settings, developing students' ability to apply learned principles and concepts in elderly community, and building a sense of empathy, social responsibility and professionalism. The results have demonstrated that the main objectives have been met and students have positive learning outcomes.

From the above analysis, skills learned, challenges and the elders' personality and characteristic have been described the most by the students. Communication, teamwork and design of site activities are the most cited skills learned. Students have also faced the challenge of communicating with the recipients, who are essentially strangers, and due to their lack of experience in dealing with elderly people. Personality of the elders has dictated on how the students would encourage recipients' willingness to engage in conversations and activities during the site service participation. Despite the limited space in the recipients' home, which is unfavourable to carrying out activities, and

miscommunication with the centre on some occasions, students have reacted quickly by changing the contents of activities. Students have also learned to consider the elders' ability when planning service activities. They have overcome most of the challenges and have found better ways to communicate with elders such as showing appreciation, using proper tone and to be patient listeners.

There are two key limitations of this study, namely the lack of comparison between students who have participated in the SL subject and those who have not, and the students' attitude before and after the completion of the subject. Some studies have found no significant differences or added value in academic learning, performance in discipline rate, attendance or drop-out rate, and civic attitudes between these two groups. [7,8] Studies that favour SL as an effective learning module may have students who are already aware of the requirements and expected outcomes prior to the completion of the subject. An alternative explanation for the positive SL outcomes is because the students are service-oriented and have an interest in providing direct contact services to clients, and thus they are more likely to prefer SL courses. [9] To further examine the effectiveness of this new SL subject in Practices of Health Promotion, a pre-post design and longitudinal study approach could be adopted in the future to identify the changes of students' attitude, learning outcomes, and the long term impacts of SL on students.

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IMPROVEMENT OF ELDERLY HEALTH CARE VOUCHER SCHEME IN HONG KONG

Cheryl C. W. Ho¹, Tommy K. C. Ng¹

1. School of Professional Education and Executive Development, The Hong Kong Polytechnic University

Correspondence: speed18037204@gmail.com

ABSTRACT

Elderly Health Care Voucher Scheme is a financial support provided by the government to the elderly for having more choices in selecting private primary health care services. It has been launched for more than ten years (including pilot scheme). The success of the voucher depends on its effectiveness so that Hong Kong elderly can benefit from it. The aim of this article is to analyse whether the voucher scheme has achieved its goals and what improvement can be made. The scheme is successful in encouraging the elderly to use private primary care, considering that the participation rate of the scheme is high, and elderly could use private health care services to supplement public health care services. Yet, the amount of the subsidy is insufficient to support the needs of the elderly and the providers of the voucher are not enough for Hong Kong elderly. Also, it is found that private health care services give the old generation an impression of expensiveness and unreliable even with the support of the Health Care Voucher. To improve the Elderly Health Care Voucher Scheme and solve the problems, the government should increase the amount of the voucher, set standards for regular monitoring, cooperate with private health care providers and invite more providers. Ultimately, the elderly would enjoy greater flexibility in choosing medical services in meeting their needs and the scheme can effectively achieve its purpose.

KEYWORDS

elderly health care, voucher scheme, primary care, private health care services

INTRODUCTION

The ageing population is rising in Hong Kong and will rise from 116 million in 2016 to 237 million in 2036. [1] In other words, the elderly accounting for the overall population will increase almost double from 16.6% to 31.1% in the same period. It is foreseeable that the spending on elderly health care will increase. To deal with the ageing population, the Hong Kong Government has launched the Elderly Health Care Voucher Scheme (the Scheme) to encourage the elderly to utilise private primary care instead of public health service. The aim of this study is to analyse the effectiveness of the health voucher scheme and provide suggestions for improvement.

HONG KONG ELDERLY HEALTH CARE VOUCHER SCHEME

The Elderly Health Care Voucher is a subsidy provided by the Hong Kong Government for the elder adults to select private primary health care services. [2] It aims to allow the elderly to choose the most suitable private medical services with financial incentives to support current private health care services and improve primary care for the elderly. The scheme encourages the elderly to establish a closer relationship with private doctors who will become familiar with their health situation and promotes the concept of family doctors. The scheme was launched in 2009 as a pilot scheme. Each elderly who was aged 70 or above could obtain five vouchers at HK\$50 each year. Based on the Interim Review in 2011, the Scheme was extended until 2014. [6] After years of operations, the amount of the Elderly Health Care Voucher had been increased to HK\$500 in

2012, HK\$1,000 in 2013 and HK\$2,000 in 2014 a year. In order to increase the flexibility on the utilisation of voucher, the face value was decreased to HK\$1 units in 2014. The Scheme started to allow the amount to be accumulated to an upper limit of HK\$3,000 since January 2014. The value of the upper limit was soon adjusted to HK\$4,000 in June 2014 and, is now at HK\$8,000 since 2019, with the allowance of \$2,000 every two years in using on optometric services. In addition, the eligibility age was dropped from 70 to 65 years in 2017 to cover and benefit more elderly.

EVALUATION

UTILISATION

The utilisation rate of the Health Care Voucher has risen from 28% to 78% between 2009 and 2017. [3] It shows that the Scheme is successful in encouraging the elderly to use private care considering that the participation has increased and most of the elderly has joined the scheme. [3]

The average frequency of each elderly visiting private western medicine trained doctors have increased from 0.62 per year in 2009 to 3.45 per year in 2015, increasing by 5.6 times. [4] For the average frequency of visiting public hospitals, it has only increased from 5.81 per year to 6.38 per year. Thus, the increase of average frequency of visiting private western medicine trained doctors is higher than that of visiting public hospitals. Not only increasing in visiting private doctors, the number of times that elderly using public services has decreased, because the average frequency of public hospital visits of each elderly was 6.65 per year in 2013, 6.47 per year in 2014 and further dropped to 6.38 in 2015. [4] As mentioned, the purpose of the Health Care Voucher is to provide chances for elderly to use private health care services to supplement public health care services. The increase in using private services through the voucher and decrease in using public services has showed the Health Care Voucher achieved this aim.

PREVENTIVE CARE

The scheme is not effective in promoting preventive care because the increasing trend of the utilisation on preventive care has not matched the participation rate. The percentage of voucher claim transactions on preventive care has risen by only 6% (from 7% to 13%) from 2009 to 2017. [5] The elderly are unwilling to pay for preventive care in the private services. [6] They prefer to pay for consultations of acute diseases. Likewise, they are

fairly satisfied with current public health care system because of the low charges. They also perceive the private health care services expensive even with the support of the vouchers. In their opinion, it is not worth to choose the expensive services when there is "no difference" in the quality of services at public and private hospitals and clinics.

As an objective of the Scheme, the elderly is encouraged to choose primary health care services. Primary health care contains promotion on health, prevention of diseases, treatment, chronic diseases and rehabilitation. [7] From Census and Statistics Department, more than three quarters of people aged 70 years and above suffer from different kinds of chronic diseases. [8] The possibility of suffering from multimorbidity by the elderly seems to be 18 times more than people aged between 14 and 25. [9] In order to avoid the chronic diseases from becoming worse, consultations for preventive measurements should be done earlier in the management of chronic diseases. [9] However, some of the preventive services and medicines for chronic diseases are expensive in the private sector. The voucher amount is not enough to cover the consultation fees and individuals need to pay for the services as well. As the result, the elderly is not willing to see private doctors, especially for diseases which require continual follow-ups. They mainly spend the vouchers for common clinic consultations only. [10] Therefore, the Scheme cannot really achieve the goal of promoting primary care.

CO-OPERATION BETWEEN THE GOVERNMENT AND PRIVATE PROVIDERS

Unfortunately, complaints about the Scheme in its operational procedures, suspected fraud and improper claims, etc., increased from 24 to 72 from 2015 to 2017 respectively. There were totally 235 complaints from 2015 to 2018. [11, 12] Committing frauds and misconducts may lead to the lack of trust between the elderly and the providers. [9] In order to encourage the elderly to use more private services, trust between the user and service provider is the key factor. [13] Therefore, willingness to use the private services may be reduced due to the lack of trust. Wong et al. have recommended that 'high commitment' (HC) mechanisms are useful in changing the behaviour, especially when the government launches a public-private partnership where the patient does not have a strong trust in the private services providers. [13] To maintain a HC, private services providers should be engaged in all stages related to the policy development and launching. Wong et al. have also suggested that the

private sector should participate more in logistic arrangements. [13] However, private providers in Hong Kong appear to support the programme passively as the government has turned a deaf ear to their concerns, such as the request on technical support. The patient registration process of the Scheme requires an advanced IT system and staff support. Private providers have difficulties in seeking help from the government. Therefore, the current situation is unhealthy in that the commitment level is not high enough and may lead to difficulty in promoting the Scheme. The co-operation and ongoing dialogue between the government and private providers must be strengthened.

GEOGRAPHICAL COVERAGE

With the development of the Great Bay Area in the Guangdong Province, some Hong Kong elderly may choose to live there for the rest of their life. [14] It is time consuming and costly if these older adults need to come back to Hong Kong to seek medical consultations. In June 2019, the government has increased the coverage of the Scheme. Elderly living in Great Bay Area and holding the Hong Kong Identity card can use the voucher for using private health care services at the Hong Kong University-Shenzhen Hospital (HKU-SZ Hospital) in Shenzhen, currently the only designated site in the Great Bay Area under the Scheme. [2]

RECOMMENDATIONS

INCREASE THE VOUCHER AMOUNT

The government should increase the amount of the voucher to meet the needs of the elderly. In this way, the elderly does not have to save and accumulate their vouchers for a few years to prepare for some expensive health care services, such as dental services and optometric services. Thus, they can receive treatment without delay.

PROMOTE THE USE OF PREVENTIVE CARE

Promotion of preventive care should be enhanced. Chong et al. suggest that the voucher office should work and co-operate with service providers to promote the Scheme for preventive services, through delivering leaflet, holding educational talks and carnival. [10] Then, the elderly can understand more about the importance of preventive care. The government can also promote the preventive care through categorizing the voucher, i.e. classifying the original voucher to general health care voucher and preventive care voucher. [9, 10] Lai et al. have proposed

to the launch the vouchers for specific purposes as the most effective way. [9] With this arrangement, the kinds of services "cashed" by voucher will be restricted and elderly who do not want to "waste" the preventive care voucher will try to use it. Then, the utilisation rate of health care voucher on preventive care will be expected to increase. Hopefully, the need for hospitalisation will be decreased in the longer term and the quality of life of the old people should be enhanced as a result of better health.

INCREASE TRANSPARENCY OF FEES

Increasing the transparency of the charges of private health care services to the elderly may increase their willingness to spend more on private services such as preventive care and consultations with the family doctors. If the elderly do not know the costs of the services, they may be hesitant to use the services because they are concerned about the fees being too high that they could not afford.

INCREASE GEOGRAPHICAL COVERAGE

The current geographical coverage of the Scheme outside Hong Kong is limited and should be expanded. Expanding the use of vouchers to regions other than Greater Bay Area and the HKU-SZ Hospital can provide even more choices for Hong Kong elderly living in the mainland. [6] Similarly, the elderly should be allowed to use health care services with the vouchers in many more parts of the Mainland since with the support and convenience of the High Speed Rail, which is making the travel so easy. Expanding the coverage of the health care voucher to beyond the Greater Bay Area is indeed a milestone of the Scheme.

Encourage private services providers to join the Scheme To achieve HC, it is necessary to encourage more private services providers to enrol in the Scheme. [9] It will be more convenient for the elderly to have access the private services. In addition, more providers will potentially lead to competition. On the other hand, providers can gain from the increased utilisation of services through positive images among the users, reasonably low fees and high quality. Eventually those providing low quality or offering services with high price will be weeded out "naturally" and as a matter of fact. The elderly will benefit from higher commitment of the private sector and more choice of service providers.

MONITOR THE PERFORMANCE OF SERVICE PROVIDERS

In order to increase the trust between the elderly and the service providers, quality should be ensured through

monitoring and, guidelines should be implemented. [9, 10] Even when low quality services are weeded out in the private sector, it does not mean that the elderly will readily trust the private services providers. Currently, the monitoring function by the government is not enough because only 2% of total claims had been inspected in the years from 2009 to 2018. [6] If more cases have been inspected and more service providers monitored, manipulation of accounts can potentially be prevented. For example, regular checking, attention to abnormal transactions, handle complains etc. should be noted closely by the Voucher Office. [6] Such measures can help to result in increased trust of the elderly and thus increase their willingness to utilise the vouchers on private services. Therefore, the government should implement some measures in the monitoring the performance of providers and checking the administrative processes. [9]

CONCLUSION

The Scheme has successfully encouraged the elderly to use private primary care and thus helps to reduce some of the burden of public health care services. However, the amount of the vouchers and number of private service providers can be increased to further meet and cater for the needs of the elderly. Unwillingness to pay for the "perceived" expensive private health services, lack of promotion on preventive services, inadequate and ineffective monitoring, and the reliability of private services providers are the reasons that the elderly does not use the voucher on preventive care or private health services as anticipated. Therefore, improvement strategies and measures are recommended to increase the effectiveness and to meet the objectives of the Scheme.

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TIME BANKING FOR ELDERLY IN HONG KONG: CURRENT PRACTICE AND CHALLENGES

Tommy K. C. Ng¹, Noel T. S. Yim¹, Ben Y. F. Fong¹

1. School of Professional Education and Executive Development, The Hong Kong Polytechnic University

Correspondence: tommy.ng@speed-polyu.edu.hk

ABSTRACT

To reduce the burden of the ageing population, time banking can be one of the possible approaches in the community to maximise social capital. Time banking aims to exchange one's time to serve others and the time of service can be saved as credit so as to swap for services when necessary. It can create a virtuous cycle for providing and receiving services. Several positive outcomes to service providers and recipients of time banking are identified in this review paper. Nevertheless, there is a lack of practical adoption of time banking in Hong Kong. To analyse the challenges of the adoption of time banking in Hong Kong, the current practices of time banking in Hong Kong will be evaluated. To promote time banking in Hong Kong, governmental, technical and educational support are recommended.

KEYWORDS

time banking, volunteering, ageing population, social capital, service learning

INTRODUCTION

Low birth rate and ageing population are two of the major social and population issues in Hong Kong, affecting adversely the development of the city. The trend of birth in Hong Kong has been deteriorating over the past 36 years from almost 17 live births per thousand populations in 1981 to 7 live births per thousand population in 2017. [1] However, the number of people aged 65 years or above is projected to increase from more than 1 million to more than 2.3 million in 2036. [2] The decline in fertility and increase in life expectancy are the main causes of the increasingly ageing population, not only leading to financial burden on the next generation but also insufficient manpower in serving the elderly.

To alleviate and ease the inevitable issue, the idea of time banking may be beneficial to the ageing population and the society. The concept of time banking can bring important implications to the community, including social, physical and psychological changes in services, and social capital. Time banking can be a virtuous circle for providing and receiving services in the community so as to lighten the excessive burden on the health care system arising from the ageing population. Likewise, volunteering is the main component of time banking. This paper aims to explore the current practices and challenges of time banking in Hong Kong.

CHARACTERISTICS OF TIME BANKING

CONCEPT AND DEVELOPMENT OF TIME BANKING

Time banking is popularised in the United States in the mid-1980s and aims to effectively and humanely utilise social welfare services through the principle of co-production. [3] It helps to build up and strengthen the social capital in the local community. [4] The concept of time banking is then widespread worldwide and is adopted in some countries. The main target service recipients of time banking are the older adults. Time bank or time banking are defined as providing an hour of service to others can earn an hour of credit or dollar, which can be used to exchange for an hour of service. [5] It means when a person provides three hours of service to help others, for example bringing meals to the elderly and accompanying with the elderly to the hospital, the person can earn and bank in three hours of credit or time dollars. The credits or time dollars can then be used to "purchase" services from others when necessary.

Time banking is a system for the exchange of time and services among elderly. [6] The development of time banking aims to reach the vulnerable and isolated elderly who may have a lack of local friends and family members to provide minimum care and accompanying medical consultations.[7] Reciprocity and trust are the norms of the basic spirit of time banking. Reciprocity is emphasised for promoting the concept of time banking. [8] Additionally, time banking advocates the idea of egalitarianism and service recipients are not the only ones to play the role of receiving. The time value of any service is equal, and every recipient has the responsibility to provide services to participants. The banks are normally created by local charity organisations or non-government organisations [9] to record the debits (hours of service received) and credits (hours of service provided) in the community.

POSITIVE OUTCOMES OF TIME BANKING

In essence, time banks help to enhance human bonding within the local community. [10] Time banking also facilitates the seeking of assistance and promotes trustworthiness in the community. [11] These align with volunteering services provided to recipients, leading to some potentially positive outcomes.

SOCIAL HEALTH

Social life is important to the elderly because they may be lack of care and concern from their family members. Social

interaction is crucial to physical and mental health, but it is easily neglected. Time banking can enhance social activities within the community so that the elderly can socialise and communicate more with others. Recipients of time banking can go to the institutions regularly to meet and get support from the service providers. They have the opportunity to reconnect to the community with access to assistance with empathy from others to lighten up their life. [12] Likewise, the home environment of the recipients can be improved without cost under the utilisation of time banking. For example, the elderly can exchange renovation or improvement service from the service providers via time banking. Trust building is essential for the development of a relationship while strengthening trust among service providers and recipients is commonly found in time banking. [13] Hence, relationship and trust can be built within the community. [6] Moreover, volunteerism in time banking may help eliminate the isolation of elderly, strengthen community participation and boost the self-esteem of the elderly. All of these have an impact in the improvement of social health. [14]

PHYSICAL HEALTH

Adopting time banking in the community may improve the physical health of the elderly. It has been shown that the number of visits to hospitals has declined because volunteers are more likely to provide preventive health service, which in turn reduces the risks from diseases and injuries. Some instrumental support offered as direct support to the elderly can promote health. [15,16] In addition, a companionship with the elderly is also a time banking service, such as accompanying the elderly to the medical centre for follow up treatment, medical consultation and exercise. [17] With more engagement with the volunteers, the amount of walking activity of the participants is increased and this can lead to better health outcome. [18] Active lifestyle of the participants, health interventions and travelling around are also found in time banking. All these services can directly facilitate the elderly to achieve better physical health because some participants feel calmer when participating in a time banking scheme. [7]

PSYCHOLOGICAL HEALTH

A timely time banking plan has positive impact on the psychological health of the elderly. People who live alone will not only have an improved self-rating in physical health but also mental health because of the change of emotion when contacting with others. [19] Although individuals in

the time banking system may think they do not have specific abilities or skills to serve the community, they are still valued by others for providing services to the recipients so that they are also important in serving in the community. [20] Time banking helps the elderly to affirm their personal values and to establish a belief that they are not truly a burden to others. Additionally, time banking activities allow the service providers and users to increase self-confidence and self-esteem. [21] On the other hand, they will be more willing and ready to ask for help when they need assistance. Thus, they are highly satisfied and engaged in time bank. [17] Overall, apart from the improvement of physical and social health, psychological health of the service recipients can be enhanced. It shows that time banking contributes to health with positive attitude towards life.

DEVELOPMENT OF SOCIAL CAPITAL

Time banking can contribute to the development of social capital. Social capital is about how the engagement of individuals generate benefits to the individuals within the community. [22] Time banking can connect the individuals within the community to provide service and it must lead to positive outcomes to the participants. Stronger sense of community, which is the outcome of social capital, can be found from the participants of time banking. [23] Participants with increased self-efficacy have higher sense of community. Building up the relationship in the community and making request of time banking contributes to social capital. It is vital that the positive outcomes of time banking can facilitate the development of social capital for the benefits of the community.

CURRENT PRACTICE IN HONG KONG

Similar to other developed counties or regions, Hong Kong is also facing the problem of an ageing society. At the same time, the predicted shortage of health care professionals can also affect the quality of long-term health care services. In Hong Kong, the implementation of time banking is still in the very early stage of development and it has been believed to be changing from the recipient

society to the participant society. [24] In 2017 Hong Kong Sheng Kung Hui Welfare Council launched a three-year time banking project named as "Zhi Fu - Elderly Mutual Help Development Scheme" in Tseung Kwan O, one of the eighteen administrative districts in Hong Kong. The main purposes of this project include promoting elderly to help each other, improving their relationship with neighbours

and increasing the participation of elderly within the community. The activities and events are proposed by the elderly while the social workers play the assistive role. [25] Almost 200 elderly members have registered with the project to provide volunteer care services to each other within the community. Members are able to accumulate over 1,000 hours of service, which is equivalent to the credit for exchanging service in the time bank. The elderly in the community are keen to serve each other and the effectiveness of time banking will be beneficial to all stakeholders. Nevertheless, the promotion and Governmental support of time banking is insufficient. Information seminars about time banking conducted by the Hong Kong Professional Teachers' Union are not regular events. As usual, the Government would not set up time banking unless non-governmental organisations have plans. [26,27] Therefore, much more work and further research on time banking are necessary in Hong Kong.

CHALLENGES OF ADOPTING TIME BANKING IN HONG KONG

Compared to other countries, there is insufficient promotion of the concept of time banking in Hong Kong, where less than three non-governmental organisations (NGOs) are providing time bank services. Promoting time banking to the community is rarely reported but social media can provide opportunity for the youngsters and the general public to get more exposure to the concept of time banking. Social media can also assist in advocating the exchange of time credits and encourage the members and non-members to attend promotional events. Apart from social media, information seminar pertinent to time banking is utterly insufficient and inadequate. Regarding education, the concept of reciprocity under time banking is not common in Hong Kong. Hence the concept of time banking cannot be delivered and popularised without enough, suitable and effective promotion.

Furthermore, volunteer projects organised by educational institutions may not be able to sustain the volunteerism of students. Sustainability and continuous volunteering of students to the community are also questionable. Secondary school students only have the Other Learning Experience (OLE) project related to community service. It was discovered that secondary school students cannot develop their personal and social responsibility in the community. [28] It can be inferred that they will not keep participating in volunteer service in the future although

they have certain prior experience. In addition, time banking is a kind of volunteer scheme and, if time banking is adopted into the OLE related community service for secondary school students, the continuity and sustainability of time banking may not be reached. Instilling the importance of volunteering in the community to the students has the room for improvement to increase the participation of youths into the time banking scheme.

With the lack of promotion, there are barriers for the participants to understand the difference between time banking and volunteering. [17] The membership of time banking in Hong Kong is less than 200, even though the demand for time bank services is high. [25] The people in need may just seek the traditional volunteer services when they cannot receive timely and appropriate care and services for a long time. Over time, the concept of time banking will cool down. In the meantime, the misunderstanding of time bank can lead to an altruism problem. [29] Time banking requires service providers to request assistance when necessary to create a chance for other participants to provide reciprocal services and to exchange for the time to service. Nevertheless, some members do not intend to receive any service but only enjoy to providing it. This causes an imbalance of the exchange of time and service. Therefore, promotion is extremely essential for the adoption of time banking in the Hong Kong community.

Governmental support is inevitable for adopting new service and system in the community. To facilitate the adoption of time banking in Hong Kong, the government should allocate resources for creating time banks in the community. Although the Hong Kong Government would like to promote public health to alleviate the burden and pressure of the health care system due to the ageing population, the current policy does not mention much about long term planning. Furthermore, the lack of governmental financial support is one of the major challenges of adopting time banking in Hong Kong since the concept of time banking is organised and established by the NGO, which bears the operating costs. Besides, the NGO needs to conduct various types of events for promoting and coordinating time banking.

RECOMMENDATIONS

To further generalise the concept of time banking in Hong Kong, the Government should provide more resources in

the community and subsidies for NGOs, including educating the community about the importance of time banking and coordinating the activities for the exchange of time and service. As the time banks cannot earn enough income to cover the administrative costs, government's financial support can help the promotion and operations of time bank. Apart from governmental support, commercial organisations can also provide assistance in the promotional process of time banking. Device development, including website and application, can establish the basic platform for users to not only exchange of service but also increase the exposure of this concept to the public. [30]

To promote the use of time banking, positive attitude towards the request and offer is essential. The ease of use in time banking platforms is positively associated with the positive attitude. [31] Electronic application of time bank can provide user friendly platform for exchange of service and also reduce the burden of human resource. An online platform is found to be useful in some countries to display the lists of services that are offering and being requested by the recipients. [32] It can facilitate the exchange of services since request of assistance from the recipients can be recorded on the Internet and service providers can offer help through online registration. Mobile application can be used to enhance the exchange of immediate request because it allows the service recipients to ask for assistance more conveniently than using website platform. The interested service providers can quickly respond to the requests by mobile phones, which enhance the possibility of exchange on the time sensitive issues.

Furthermore, educational support and promotion can allow students to familiarise with the concept of time banking. Emphasising the effectiveness of time banking and volunteering in the schools may allow students' involvement of volunteer service in the community. Likewise, service learning embedded with the concept and practice of time banking can lead to positive outcomes for the students because they can gain beneficial experience apart from learning from textbook or in the classroom. [33] Young people should be encouraged to join time banking projects. In addition, the involvement of students may be beneficial to the relationship between young people and older adults. [34] Moreover, earning time credits earlier in life could have direct and indirect benefits. Youths can apply their skills and techniques to optimise the operations of time banking for the improvement in the community. Furthermore, youths who participate in volunteering and

Other Learning Experiences (OLE) services are found to remain involved for providing services in the community. [28] Overall, a virtuous cycle can be formulated to better promote and sustain time banking in the community.

Hong Kong people are in general altruistic but less willing to seek help from others, and this behaviour can be a social problem arising from altruism. [35] To tackle this issue, the approach of time banking can be modified from earning for oneself to earning for family members, relatives or people in the society. If the participants can earn time credits for their family and relatives or donate the time credit to people in need, it matches the characteristics of altruism through helping others. Therefore, the service providers do not only help the recipients but also other potential recipients in the community. In the end, the proposed new approach can create more service opportunities for service providers.

PATH TO IMPACT

The development of time banking provides the chance for the elderly to reconnect to the community and to establish self-confidence. The exchange of time and service can be beneficial not only to the service recipients but also to the providers in the social, physical and psychological aspects. In other developed countries, such as United States, United Kingdom and Japan, the time banking concept is more developed. Insufficient promotion and financial support by the Government are the main causes leading to the lagged development and operations of time banking in Hong Kong. The Government should take the initiative to publicise and promote the concept of time banking. A supporting policy and funding mechanism will pave the path to benefit the community.

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MEDICAL QUALITY AND WELL-BEING PERCEPTION OF SENIOR TOURISTS

Pimtong Tavitiyaman¹, Wanlanai Saiprasert²

1. School of Professional Education and Executive Development, The Hong Kong Polytechnic University, Hong Kong

2. Management and Entrepreneurship Department, Faculty of Business Administration, Chiang Mai University, Thailand

Correspondence: pimtong.t@cpce-polyu.edu.hk

ABSTRACT

OBJECTIVES

Advanced medical treatments and service quality for Hong Kong residents are well regarded. However, numerous senior residents continue to explore alternative medical treatments and wellbeing activities outside the region. The research objectives of this study are 1) to assess the perception of senior tourists of the medical quality attributes of medical tourism destinations and 2) to compare the different perceptions of tourists of medical service attributes, wellbeing and behavioural intention towards medical tourism destinations.

DESIGN

The questionnaire instrument was written in English and Chinese based on the literature review. The target population was senior residents with experience in seeking medical treatments and services abroad, specifically, outside Hong Kong. Convenience sampling was employed to recruit senior respondents to answer the questionnaire. Data collection was from July to October 2019 in residential areas and senior citizen neighbourhood centres in Hong Kong.

RESULTS

Results show that among the 74 respondents, only 42% have overseas medical experiences. The countries involved are Taiwan, South Korea, Japan, China, the United States, Malaysia and Thailand. The senior residents have a more positive perception of medical quality (e.g. appointment procedure, short waiting time and physician reliability) and wellbeing (e.g. response to needs and social wellbeing) in overseas medical destinations compared

with Hong Kong. However, no mean difference is observed in behavioural intention between Hong Kong and overseas medical destinations from the perspective of the senior respondents.

CONCLUSIONS

Hong Kong senior residents may consider travelling overseas to seek medical treatments and wellbeing activities. Senior residents tend to travel to nearby countries for cosmetic/plastic surgery, eye surgery/Lasik and dental surgery. Moreover, senior residents perceive the communication skills of physicians and staff overseas in answering enquiries on medical procedures whilst receiving medical treatment as high quality compared with Hong Kong.

KEYWORDS

medical quality, wellbeing perception, behavioural intention, Hong Kong, medical destination, senior resident

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INTRODUCTION

The medical tourism industry integrates the medical and tourism sectors and is a specific form of tourism in which 'people travel to overseas countries to obtain medical, dental or surgical services whilst simultaneously being holiday makers, in the more conventional sense'. [1] Medical tourism presents outsourced medical services in other countries, where the costs of such offerings are lower than those in the tourists' home country. [2] According to the Transparency Market Research (2016), the benefits of medical tourism worldwide reached US\$46 billion in 2016. [3] Benefits of tourism are growing at a rate of more than 20% annually. [4]

A research gap exists in the academic examination of medical tourism. The concept of medical tourism has been investigated by numerous scholars, few studies have covered the development of medical tourism in Hong Kong, [5, 6] especially from the perspective of senior tourists. Senior groups as tourists are predicted to become a powerful consumer group in the future. [7] Senior tourists are not one large homogenous group, but small homogeneous groups based on reasons for travelling for pleasure. [8] People are living longer and seeking alternatives for curing sicknesses and enhancing wellbeing and quality of life. In addition, past travel experiences and media exposure can influence tourists' perception of medical tourism destinations. [9]

The purpose of this study includes the following: 1) to assess senior tourists' perception of the medical quality attributes of medical tourism destinations and 2) to compare tourists' different perceptions of medical service attributes, wellbeing and behavioural intention towards medical tourism destinations. This study can substantially contribute to medical tourism destinations in planning marketing campaigns to attract senior groups and promote sustainability.

LITERATURE REVIEW

PERCEIVED MEDICAL SERVICE QUALITY FOR THE SILVER MARKET

Service quality is often used to measure the delivery process (technical quality) and outcomes (functional quality). [10] Superior service quality can increase the level of patient-perceived value and satisfaction, which can

affect their behavioural intention. [10] Service quality in the medical sector includes aspects of technical and functional qualities that reflect tangible (e.g. appearance of physical facilities and medical equipment), expertise (e.g. staff performance in relation to tasks) and outcome (e.g. success of final treatment) quality measures. Chuang, Liu, Lu and Lee [11] explained the two main paths of medical tourism. The first path relates to the evolution of medical tourism and its association with problems, motivational factors, marketing strategies and economic analysis. The second path concerns organ transplantation, ethics, risks and regulatory-related issues. Medical tourism destinations have attempted to develop infrastructures and regulate proper healthcare policies to promote the optimistic prospects of the medical and healthcare industry. Although the advancement of medical treatments and services is well regarded in Hong Kong, limited resources in hospitals, clinics, physicians and staff exist. Certain residents prefer other countries as a travel alternative, including for receiving medical services.

The literature has explained the examination of medical tourism in numerous countries. For example, different perceptions of medical tourism in South Korea among patients from the United States, Russia, Japan and China are explored. [12] Meanwhile, Wu, Li and Li described the perception of Chinese tourists of medical tourism in Taiwan. [13]

PERCEPTION OF PSYCHOLOGICAL WELLBEING

Psychological wellbeing is defined as an individual's self-evaluation of feelings of happiness and life satisfaction. [14] Psychological wellbeing is associated with emotional states and mental health, such as happiness, delight, satisfaction, depression, worry and anxiety. The determinants of wellbeing are categorised as competence, relatedness and health, wealth, personal values and freedom of choice. [15] The perception of wellbeing is interchangeable with the concept of quality of life, welfare and happiness. [16] Currently, world populations are older and live longer and have increased opportunities to enhance their quality of life and wellbeing by travelling and participating in recreational activities.

BEHAVIOURAL INTENTION

Blackwell, Miniard and Engel described intention as 'subjective judgments about how we will behave in the future. [17 p.285] Fishbein and Ajzen [18] explained behavioural intention as functions of 1) evaluative beliefs towards tourism products, 2) social factors that tend to

provide a set of normative beliefs to tourists and 3) situational factors that can be anticipated at the time of vacation plans or commitment. Zeithaml, Berry and Parasuraman [19] classified customers' future intentions into four categories, namely, 1) referrals, 2) price sensitivity, 3) repurchase behaviour and 4) complaining behaviour. The stronger the intention to engage in a behaviour, the more likely the performance of that behaviour. Behavioural intention is used commonly as a predictor of customer loyalty and firm success. [9] The effect of the perceived value of medical services influences the behavioural intention of tourists. [13]

METHODS

RESEARCH DESIGN AND SAMPLING APPROACH

This was an exploratory study. The target population of this study was local senior tourists living in Hong Kong with experience in seeking medical treatments abroad. A convenience sampling approach was used, and senior members from ageing centres and associations as well as local senior residents were chosen.

INSTRUMENT DEVELOPMENT

The questionnaire used in this study consisted of three sections. Section I asked the respondents to indicate their perception of overseas medical service attributes. Section II was designed to compare the respondents' perception of medical service quality, wellbeing and behavioural intention towards home and host medical destinations. Seven-point Likert-type scales with end-anchors labelled 'strongly disagree' and 'strongly agree' were used in Sections I and II. Related literature on the perceived service quality of medical attributes and future behavioural intention was adopted. [5, 20, 21] Three items for the wellbeing perception measure were adopted from Hwang and Hyun. [22] Section III consisted of close-ended questions. The respondents were asked to provide their demographic profiles such as gender, age, and education level. The questionnaire was in English and in Chinese and back-to-back translation was moderated to test the validity of the items.

DATA COLLECTION PROCEDURE AND DATA ANALYSIS

Data collection was conducted in ageing centres and local residential areas in Hong Kong. The administrative staff of ageing centres and associations asked the seniors to participate in this study voluntarily. Meanwhile, research assistants approached local senior residents to participate in answering the questionnaire. Data were collected from July to October 2019, and 74 respondents returned the questionnaire.

The descriptive statistics of frequencies and percentages were employed to describe the profile of the respondents, their medical treatment behaviours and perception of overseas medical experiences. T-test analysis was used to test the mean differences of the senior tourists' perception of perceived quality, wellbeing and behavioural intention towards home and host medical services. [23]

RESULTS

CHARACTERISTICS OF SENIOR RESPONDENTS

Table 1 shows the demographic characteristics of the respondents. A total of 63.9% of the respondents are female, and 36.1% are male. Most of the respondents are over 50 years (97.3%), and only 2.7% are between the ages of 40 and 49 years. In terms of income, 29.7% of the respondents earn less than HK\$10,000 per month, and 33.8% receive HK\$10,001–30,000 monthly. 39.2% of the respondents have completed high school education or lower, 20% have associate or higher degrees, 27% have a bachelor's degree and 13.5% have a postgraduate degree. Many of the respondents are self-employed (18.1%) and retired (36.1%).

TABLE 1: DEMOGRAPHIC CHARACTERISTICS AND MEDICAL TOURISM EXPERIENCES OF RESPONDENTS

ATTRIBUTES	N	%
Gender		
Male	13	36.1
Female	23	63.9
Age		
40-49 years old	2	2.7
50-55 years old	29	39.2
56-60 years old	21	28.4
61-65 years old	17	23.0
Above 65 years old	5	6.7
Income (monthly HK\$)		
< HK\$10,000	22	29.7
HK\$10,001-30,000	25	33.8
HK\$30,001-50,000	23	31.1
HK\$50,001-80,000	4	5.4
Education		
High school or below	29	39.2
AD/HD	15	20.3
Bachelor degree	20	27.0
Postgraduate degree	6	8.1
Professional certificate	5	5.4
Occupation		
Government official	5	6.9
Teacher/professor	3	4.2
Executive/manager	6	8.3
Administrative staff	9	12.5
Professional/technician	10	13.9
Self-employed	13	18.1
Retiree/Not working	26	36.1

PERCEIVED MEDICAL SERVICE QUALITY BY MEDICAL TOURISM DESTINATION

Perceived medical service quality by medical tourism destination is presented in Table 2. Among the seven medical tourism destinations, the respondents perceive the United States as having the most positive medical service qualities (mean = 4.56), followed by Japan (mean = 4.32) and Taiwan (mean = 4.17). Meanwhile, the respondents perceive China and South Korea as having the least positive medical service qualities, with a mean of 4.05 and 3.66, respectively. The top three medical attributes are 'the physicians adequately explained my condition, examination results and the medical process' (mean = 4.53), 'the physicians paid adequate attention to my concerns in deciding on a medical procedure' (mean = 4.46) and 'the physicians allowed me to ask many questions' (mean = 4.43). Meanwhile, the respondents rate the following as the least positive medical attributes: 'the process for setting up the medical procedure appointment was simple and easy' (mean = 3.77) and 'assistance with financial arrangement, including advance estimates for fees and payments' (mean = 3.74).

DIFFERENT PERCEPTIONS OF MEDICAL SERVICE ATTRIBUTES BY MEDICAL TOURISM DESTINATION

Table 3 describes the mean differences between medical service attributes, wellbeing, and behavioural intention by medical tourism destination (Hong Kong and overseas destination).

For perceived medical quality attributes, 8 out of 20 items differ significantly. The respondents perceive more positive

experiences in overseas medical destinations compared with Hong Kong. These items include 'medical staff was polite and friendly' (meanHong Kong = 3.57, meanoverseas = 4.23, t-value = -3.95, $p < .01$), 'the physicians adequately explained my condition, examination results and the medical process' (meanHong Kong = 4.00, meanoverseas = 4.52, t-value = -3.37, $p < .01$) and 'the physicians paid adequate attention to my concerns in deciding on a medical procedure' (meanHong Kong = 3.81, meanoverseas = 4.35, t-value = -3.30, $p < .01$). By contrast, the respondents perceive only two items in terms of medical quality attributes that are more positive in Hong Kong compared with overseas medical destinations. These items are 'the process for the medical procedure appointment was simple and easy' (meanHong Kong = 4.10, meanoverseas = 3.81, t-value = 2.18, $p < .05$) and 'ease of assembly and transmission of medical record/information' (meanHong Kong = 4.13, meanoverseas = 3.87, t-value = 2.10, $p < .05$).

In terms of wellbeing perception, two out of four items have mean differences between Hong Kong and overseas medical destinations. The respondents perceive wellbeing more positively in Hong Kong compared with overseas medical tourism destinations. These items are 'the medical treatment met my overall wellbeing needs' (meanHong Kong = 4.00, meanoverseas = 4.32, t-value = -2.55, $p < .05$) and 'the medical treatment played a very important role in my social wellbeing' (meanHong Kong = 4.03, meanoverseas = 4.32, t-value = -2.51, $p < .05$). However, no mean difference is observed in behavioural intention towards medical tourism destinations.

TABLE 2: COMPARISON OF PERCEIVED MEDICAL QUALITY BY MEDICAL TOURISM DESTINATIONS

MEDICAL TOURISM ATTRIBUTES	TAIWAN (N=7)	SOUTH KOREA (N=6)	JAPAN (N=4)	CHINA (N=4)	USA (N=4)	MALAYSIA (N=2)	THAILAND (N=2)	MEAN AVERAGE
1. The process for the medical procedure appointment was simple and easy	3.86	3.50	4.00	4.00	4.00	3.00	4.00	3.77
2. Ease of assembled and transmitted of medical record/information	4.00	3.33	4.00	4.00	4.25	3.50	4.00	3.87
3. It is short waiting time for the medical examination	3.71	3.50	4.00	4.50	4.00	4.00	5.00	4.10
4. The physicians paid enough attention to my concerns	4.29	3.67	5.00	4.00	4.75	4.50	5.00	4.46
5. The physicians adequately explained my condition, examination results, and medical process	4.86	3.83	5.00	4.25	4.75	4.50	4.50	4.53
6. The physicians allowed me to ask many questions	4.71	3.83	4.50	4.50	5.00	4.00	4.50	4.43
7. The medical staff has good communication skills	4.57	3.33	4.50	4.25	5.00	4.00	4.50	4.31
8. Medical staff was polite and friendly	4.50	3.67	4.50	4.00	4.50	4.00	4.50	4.24
9. The hospital has state-of-the-art facilities and equipment	4.00	3.83	4.50	3.50	4.75	4.00	4.00	4.08
10. Hospital care facilities were easy to find	4.14	3.83	5.00	3.50	4.50	4.00	3.50	4.07
11. The hospital amenities were conveniently located	4.14	4.00	3.75	3.75	4.00	4.00	3.50	3.88
12. The hospital has a strong concern of patient safety	4.29	4.00	4.50	4.00	4.50	4.50	3.50	4.18
13. The hospital's attention to patient's privacy and disclosure	4.43	4.00	4.50	4.00	4.75	4.50	4.00	4.31
14. The hospital has acceptable protection against medical malpractice and liability	4.29	3.83	4.50	4.25	4.50	4.50	4.00	4.27
15. The payment procedure was quick and simple	4.14	3.67	3.75	4.25	4.50	4.50	4.50	4.19
16. Convenient package pricing	3.86	3.67	4.0	4.25	4.25	5.00	4.50	4.22
17. Assistance with financial arrangement	3.86	3.33	4.25	4.0	3.25	4.00	3.50	3.74
18. Convenient hospital transportation arrangement	4.00	3.67	4.00	4.25	4.25	3.50	4.00	3.95
19. Good coordination of arrangements among the patient, hospital, and other businesses	3.71	3.33	4.25	3.75	4.25	4.00	4.00	3.90
20. I am very satisfied with services received	4.14	3.50	4.00	4.00	4.50	4.50	4.00	4.09
Mean average	4.17	3.66	4.32	4.05	4.41	4.12	4.15	4.13

TABLE 3: MEAN DIFFERENCES OF PERCEIVED MEDICAL QUALITY BY MEDICAL DESTINATIONS

Construct	Mean (SD)		t-value	Sig.
	Hong Kong	Overseas		
Perceived medical quality				
1. The process for the medical procedure appointment was simple and easy	4.10 (.70)	3.81 (.54)	2.18	.03*
2. Ease of assembled and transmitted of medical record/information	4.13 (.71)	3.87 (.56)	2.10	.04*
3. It is short waiting time for the medical examination	3.35 (1.01)	3.94 (.81)	-2.37	.02*
4. The physicians paid enough attention to my concerns	3.81 (.94)	4.35 (.79)	-3.30	.00**
5. The physicians adequately explained my condition, examination results, and medical process	4.00 (.77)	4.52 (.67)	-3.37	.00**
6. The physicians allowed me to ask many questions	3.87 (.76)	4.45 (.72)	-3.15	.00**
7. The medical staff has good communication skills	4.10 (.70)	4.29 (.69)	-1.29	.20
8. Medical staff was polite and friendly	3.57 (.81)	4.23 (.72)	-3.95	.00**
9. The hospital has state-of-the-art facilities and equipment	3.71 (.73)	4.10 (.70)	-2.44	.02*
10. Hospital care facilities were easy to find	3.94 (.44)	4.06 (.72)	-.94	.35
11. The hospital amenities were conveniently located	3.77 (.61)	3.87 (.76)	-.72	.47
12. The hospital has a strong concern of patient safety	4.16 (.77)	4.16 (.68)	.00	1.00
13. The hospital's attention to patient's privacy and disclosure	4.23 (.84)	4.26 (.72)	-.20	.83
14. The hospital has acceptable protection against medical malpractice and liability	4.13 (.71)	4.23 (.84)	-.61	.54
15. The payment procedure was quick and simple	4.16 (.82)	4.10 (.59)	.38	.70
16. Convenient package pricing	3.87 (.88)	4.06 (.62)	-1.18	.24
17. Assistance with financial arrangement	3.77 (.76)	3.71 (.78)	.31	.75
18. Convenient hospital transportation arrangement	3.97 (.83)	3.97 (.70)	.00	1.00
19. Good coordination of arrangements among the patient, hospital, and other businesses	3.90 (.70)	3.84 (.68)	.49	.62
20. I am very satisfied with services received	3.90 (.79)	4.06 (.62)	-1.15	.25
Wellbeing perception				
1. The medical treatment met my overall well-being needs	4.00 (.57)	4.32 (.65)	-2.55	.01*
2. The medical treatment played a very important role in my social well-being	4.03 (.70)	4.32 (.65)	-2.51	.01*
3. The medical treatment played a very important role in enhancing my quality of life	4.26 (.63)	4.48 (.62)	-1.65	.10
Behavioral intention				
1. Say positive things to my relatives and close friends	4.06 (.77)	4.26 (.72)	-1.18	.24
2. Recommend to my relatives and close friends	4.13 (.76)	4.26 (.68)	-.89	.38
3. Continue to use this hospital/clinic service in the future	4.16 (.73)	4.03 (.70)	.84	.40
4. Spend more money on the medical treatment even if the price increased	3.68 (.94)	4.03 (.65)	-1.94	.06

*P< .05, **P< .01

DISCUSSION AND CONCLUSION

This research assesses tourists' perception of medical quality attributes by medical tourism destination and compares tourists' different perceptions of medical service attributes, wellbeing, and behavioural intention by medical tourism destination. The results support the previous study of Wu et al. [13]

The results show that tourists rate medical tourism attributes differently. Most of the Hong Kong seniors consider visiting medical tourism destinations near the region, such as China, Japan, Malaysia, South Korea, Taiwan and Thailand. Only the United States is mentioned by the senior tourists for medical visits in a different continent. The tourists have a more positive perception of the medical treatments they received in the United States, Japan and Taiwan. Medical tourism attributes that are perceived positively include high-quality physicians and staff, specifically, their excellent communication skills and ability to answer questions responsively and explain medical procedures well, which is like the study of An. [12] Meanwhile, physicians in Japan focus on medical procedures and processes. Furthermore, the respondent's rate medical services received in China and South Korea as the lowest. The tourists have a low perception of hospital facilities and locations in China. Tourists who have received medical treatment in South Korea rate the communication skills of the staff, ease of obtaining medical information and waiting time for medical examinations as low.

This investigation on perceived medical quality and wellbeing indicates that such perceptions differ depending on the medical tourism destination. Senior tourists who have received medical treatment in overseas medical tourism destinations have a positive perception of the quality of physicians and staff in terms of being polite and friendly to patients, providing adequate information on medical procedures and paying attention to the patient's needs. Satisfactory hospital facilities and short waiting time are rated more positively in overseas destinations compared with Hong Kong. In addition, overseas physicians and staff are willing to answer questions, provide details on medical procedures and processes and are polite and friendly. This perception may be due to the hospital or clinic situations in Hong Kong, which are often extremely busy and packed. Thus, the medical staff may not have extra time for the patients. Hong Kong medical services are well perceived in

terms of ease of medical procedure appointments and ease of assembly and transmission of medical records.

Managerial implications are provided. Firstly, medical tourism destinations can offer certain medical treatments and services that can meet seniors' preferences in terms of time and finances, such as medical check-ups and dental surgery. This implication can enhance travel itineraries embedded with medical treatment purposes. Secondly, Taiwan and South Korea are major medical tourism destinations for Hong Kong senior tourists. However, the United States and Japan are highly rated in terms of overall satisfaction in medical services. These countries can improve the level of medical and service standards to sustain medical tourism awareness. Lastly, high-quality physicians and staff are the key strengths of overseas medical tourism destinations. Hospitals, clinics and medical tourism management should emphasise quality training for medical staff and related employees to enhance the quality of medical care. [13] The promotion of this service niche can strengthen the positioning of hospitals and clinics in medical tourism destinations. For instance, South Korea is recommended to position itself as a medical tourism destination in terms of high-tech-related sophisticated treatment; fostering excitement, sense of belongingness and self-respect; and being well-respected. [9, 23]

LIMITATIONS AND FUTURE RESEARCH

This study is not without limitations. The sample size of seniors with medical tourism experiences abroad is relatively small. Increasing the number of respondents can reflect comprehensive insights. The data were collected during the political instability in Hong Kong. Therefore, the perception of local medical treatments and services may differ. Future research can be conducted at a different time to enhance the generalizability of the perception of the respondents.

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OVERVIEW OF PALLIATIVE CARE SERVICE IN HONG KONG

Hilary H.L Yee¹, Ben Y.F Fong², Tommy K.C Ng¹

1. School of Professional Education and Executive Development, The Hong Kong Polytechnic University

2. College of Professional and Continuing Education, The Hong Kong Polytechnic University

Correspondence: hilary.yee@speed-polyu.edu.hk

ABSTRACT

Palliative care service is a growing trend for patients with terminal illnesses. The purpose of palliative care is to improve the quality of life for the patients and their family by providing comprehensive care such as symptoms control, pain relief and counselling support. More and more people prefer to spend the final stage of their life in a comfortable environment with adequate care. However, Hong Kong is only ranked 22 in 2015 Quality of Death Index, and hence enhancement of palliative care service is much needed. This review paper aims to evaluate the current resources and development of palliative care service in Hong Kong and suggest improvement of the service. This study reveals that the system in Hong Kong lacks a comprehensive policy, thus limiting organisations to provide the service to small-scale operations and resulting in fragmentation of the co-operation between the public and private sectors. Factors such as professional training, community engagement, culture and financial issues are affecting the development and adequacy of palliative care service.

KEYWORDS

palliative care; quality of life; Quality of Death Index; palliative care guideline; government policy; end of life issues

INTRODUCTION

The World Health Organization (WHO) defines palliative care service as:

'an approach that improves the quality of life of patients, both adults and children, and their families facing the problems associated with life-threatening illnesses through the prevention and relief of suffering by means of early identification impeccable assessment, and treatment of pain and other problems, physical, psychosocial, or spiritual.' [1]

One of the most widely known life-threatening illnesses is cancer. There were around 30,000 new cancer cases in Hong Kong in 2016, which was an increase of 3% as compared with the previous year, [2] Apart from the conventional treatments like radiotherapy and chemotherapy in cancers, palliative care is an approach to manage symptoms and side effects of cancers and their treatments. According to the statistics from the Hospital Authority (HA) of Hong Kong, around 68% of cancer patients had received palliative care before death in 2012-2013. Often, the service is offered as soon as cancer is diagnosed, during cancer treatment or continued after treatment. [3]

In addition to cancer patients, palliative care also covers patients who suffer from other serious illnesses such as Parkinson's disease, dementia and chronic life-limiting diseases such as cardiovascular diseases, chronic respiratory diseases or AIDS, [4] In Hong Kong, 44% of

patients with end-stage renal failure have received palliative care. [3] Based on individual's needs, palliative care services may include pain relief, management of distressing symptoms like vomiting and shortness of breath, emotional support and counselling for both patients and their families, and helping them to explore their beliefs and values. It is a team approach to find out the needs of patients and their families and offer a support system to improve their quality of life when facing problems associated with life-limiting and terminal illnesses. [1] In addition to clinical care, the professional team provides psychological, emotional, and social care, and thus palliative care is called supportive care or comfort care.

RESOURCES OF PALLIATIVE CARE SERVICES IN HONG KONG

HOSPICE BEDS

Currently, there are approximately 360 hospice beds available in 16 hospitals under the HA that provide comprehensive palliative care such as symptom control and psychological counselling for terminally ill patients and their family. [3] Based on the total population of 7.41 million in 2017 [5], there are around 4.8 in-patient hospice beds per 100,000 of the Hong Kong population. Non-government organisations (NGOs) such as the Haven of Hope Christian Service (HOHCS), Hong Kong Anti-Cancer Society (HKACS) and Society for the Promotion of Hospice Care (SPHC) also provide hospice care services. HOHCS provides 124 beds for palliative and hospice care services, while the Jockey Club Home for Hospice (JCHH) offers 30 part-public and part-private beds under SPHC. The Hong Kong Anti-Cancer Society Jockey Club Cancer Rehabilitation Centre (JCCRC) provides 180 beds to cancer patients or seriously ill patients. [6]

HUMAN RESOURCES

There were around 300 nurses engaged in the provision of palliative care up to 2011 [7]. As palliative care is not a compulsory module in the nursing courses, nurses who are interested in working in this field need to take postgraduate courses or diplomas. They include a specialty nursing programme in palliative care provided by the Hospital Authority Institute of Advanced Nursing Studies, a diploma in oncology and palliative care for healthcare professionals, a higher diploma in community healthcare for senior citizens. There are also some structured palliative care training workshops provided to nurses as well as other

healthcare workers by institutions such as the HKACS, SPHC and the Federation of Medical Societies of Hong Kong. [8] There are 49 specialist palliative care physicians in Hong Kong. [9] There are currently only 22 registered specialists in palliative medicine which is a subspecialty of medicine. [10] Since 2012, clinical psychologists and medical social workers are also included in the public healthcare sector to promote a multidisciplinary palliative care team and to support the psychosocial needs of patients and their families. [11]

TYPES OF PALLIATIVE CARE

There are mainly four types of palliative care including, inpatient, outpatient, home and day care. Inpatient palliative care is suitable for patients with moderate to serious or unstable symptoms. They require daily treatments, most often at hospitals, medical centres or nursing homes. Some patients who are suffering from late stage diseases will have rehabilitation treatment to maintain their daily living activities. For patients who are staying in an acute unit, doctors and nurses from the palliative consultative team will visit them regularly to provide consultation and support. [12]

Outpatient care is suitable for stable and discharged patients. Patients who are in late stage with specialty treatment or psychological issues are normally referred to outpatient care clinics. [12]

Home care assists patients who are weak and unable to attend follow-up care in the outpatient clinic. The home care team will go to the patients' home to care for them and to monitor their health conditions. They may also help patients and their family and relatives to plan and prepare the death at their home. The team will stand by and counsel families and relatives before and after the patients' death to manage psychological breakdown during the whole process. [12]

Day care is suitable for patients who are stable and require monitoring every day. It provides the patients social activities and group or individual psychological counselling service to improve their quality of life. Usually, there is a resource centre in the day care service that provides education material to family and relatives and, medical equipment for patients to use. [12]

END-OF-LIFE SERVICES

End-of-life (EOL) care is an integral part of palliative care and is the provision of care and support for patients who are approaching death. The Social Welfare Department (SWD) of the Hong Kong Government has been adjusting the subsidy amount for contract residential care homes for elderly (RCHEs) and requires them to integrate EOL care into their care services on palliative care. [13] SWD aims to have all contract RCHEs providing EOL care services by the end of 2019-20. [14]

As palliative care service is mainly provided by HA, it has supported the development of palliative care by issuing different guidelines, including guidance for clinicians on advance directives in adults in 2010, do-not-attempt cardiopulmonary resuscitation (DNACPR) in 2014 and guidelines on life-sustaining treatments in the terminally ill in 2015. In addition, the Hong Kong west community geriatric assessment team of the HA has initiated an EOL pilot programme for the RCHEs, in cooperation with the Tung Wah Group of Hospitals Jockey Club Care and Attention Home since 2009. [15] The programme provides opportunities for RCHE staff to receive palliative care training in Taiwan and has shown in return a reduction of acute hospital admissions of their patients.

In order to have a multidisciplinary team for palliative care, HA has continued to offer more education and training programmes for health professionals in general hospital wards, staff in home care, and professional societies in recent years in order to equip them with better skills and knowledge in palliative care. [11] Since 2012, a funding of around \$12 million per year has been initiated by HA to recruit clinical psychologists and medical social workers in the public healthcare sector, with the aim of addressing the psychosocial needs of patients and their family.

ADVANCE DIRECTIVE POLICY

Advance directive (AD) is a legal statement, usually in writing, in which a person has signed in advance to indicate the kind of healthcare he or she would like, if he or she would wish to have extraordinary life-sustaining treatment to prolong life in the future. The purpose of setting an AD is to safeguard a person's will and preference for future medical or personal care when he or she is no longer mentally competent. [16,8] It also aims to benefit people in receiving appropriate palliative care services and improve their quality of life. AD should be made voluntary and optional to all individuals.

The concept of advance directive has been promoted in a non-legislative approach under the existing common law framework since the report made by Law Reform Commission of Hong Kong in 2006. [8] Hong Kong currently relies on the common law framework and the Strategic Service Framework for Palliative Care made by the HA [3] to carry out advance care planning (ACP) and a valid AD with patient's consent to receiving health treatment. Due to the legal uncertainties, health professionals are under difficult situations to follow or unfollow an AD which may create conflicts with patient's will and right to refuse treatment. Therefore, the Hong Kong Government launched a public consultation in September 2019 to solicit the opinion of the public on legislation of AD and dying in place.

POLICY RECOMMENDATIONS

TO ESTABLISH A GUIDELINE TO ASSESS THE NEEDS OF PALLIATIVE CARE

Apart from stepping up the effort in legalising AD after the public consultation, a guideline with criteria assessment is also needed to facilitate the medical team to screen patients for unmet palliative care in advance. Two assessment guidelines, assessment at the time of admission and assessment during day hospital should be developed. [17] Both guidelines should be divided into primary and secondary criteria to screen patients at basic needs and high likelihood of palliative care needs respectively. In assessment during the admission, the primary criteria should assess patients' frequency of admissions to the hospital, complexity of the care requirements, decline in body function and so on, while the secondary criteria should assess the age of patients, their admission from long-term care facility, cognition condition, availability of social support, chronic disease and so on. During the hospital stay, primary criteria should include difficulty of controlling physical or psychological symptoms, length of staying in intensive care unit, disagreements or uncertainty among patients, staff etc. For secondary criteria, transplantation of solid-organ, emotional or spiritual distress of patients, family should be assessed. With a well-developed guideline, the medical team can respond effectively upon identification of issues and initiate referrals to doctors specialised in palliative care for further consultation. Thus, the patients can benefit from adequate management of pain and symptoms, and emotional, spiritual and social issues in advance.

EXPANDING PROFESSIONAL EDUCATION AND TRAINING

Education on palliative care curriculum should be expanded and made compulsory in the training of health professionals. Currently education opportunity in palliative care is limited to the diploma and workshops provided by the University of Hong Kong School of Professional and Continuing Education and School of Continuing and Professional Studies of The Chinese University of Hong Kong. For nurses, apart from certificate programmes provided by the Hong Kong College of Gerontology Nursing and Hong Kong Association of Gerontology, more certification programs for both hospice and palliative care nurses should be provided. The Hong Kong government should enable nurses to be formally registered as specialised nurses in palliative care instead of being diploma and certificate holders. These measures will increase the incentives for professionals to work and develop in this field and to position themselves in their career.

There should be on-the-job training courses on improving communication skills and how to handle the topic of death with sensitivity. Doctors, nurses, social workers and other staff in hospitals should discuss EOL issues and palliative care service with patients and their family members during early hospitalisation period, but not at the very late stage of illness. They should be trained to identify the right timing to initiate referral to avoid any delay and to explain the care and treatment options clearly to patients and their family. In particular, such training should be promoted to specialties and units that are not interested in, or have a low awareness or inadequate knowledge on palliative and EOL care.

IMPROVING PUBLIC KNOWLEDGE AND EDUCATION

To clarify the concept of palliative care service and to avoid misunderstanding, the government should actively promote palliative care service to the public through regular talks, workshops and seminars in the community, and through the social media. In local hospitals, eye-catching posters and leaflets about palliative care services should be displayed in order to let patients and their relatives obtain, understand and use information of the service. On the other hand, family members of patients often play an active role in making health-related decisions including medical treatment as they would want to prolong a patient's life. There are patients who would rather refuse discussing future care with family members to avoid tension.

Through education at schools and community activities, students and the public can learn how to respect the wish and preference on medical treatment of the patients as some of whom may not want others to make the decision for them based on their own value. People can also learn to accept death as part of life and the ways to choose the most suitable health care services. To encourage more people to talk about death and bereavement in the society, organising 'Death Cafes' can allow participants to freely voice out their views and concerns over death with one another. Moreover, talks about different cultural perspectives on death can also educate the public to have a wider view on death.

INCREASING FUNDING ON PALLIATIVE CARE SERVICE

Since expenditure on public and private health care in the Hong Kong is only about 5.8% of the Gross Domestic Product (GDP) in 2017/2018 (Hong Kong's Domestic health Accounts, 2019), compared to other countries like Japan (10.7% of GDP) and United Kingdom (9.6% of GDP), the proportion for palliative and EOL care expenditure is relatively limited. Palliative care and EOL investment should be a policy priority. The government should provide sufficient funding on palliative care service by increasing the supply of specialists and facilities such as hospices and RCHEs.

A department responsible for palliative care in public and private hospitals should be setup to manage patients' referrals and communication between different healthcare and social services sectors. In addition, equipment such as vehicles and medical instruments for patient transferal service should also be provided. Palliative care service should not only rely on the provision by HA but should be widely expanded to include NGOs and the private sector. Instead of one-off funding, continuous funding and charity programme to NGOs can support them to provide sustainable service in the community as well as designing a caring environment in patients' wards and arranging more home visits by care providers.

RESEARCH ON PALLIATIVE CARE

Research incentive is another area to be improved in palliative care. Research related to effects and impacts of palliative and EOL care services on patients and their family members have always been limited. Local data are important as findings from other countries may not be

applicable or culturally appropriate to Hong Kong. Therefore, the government should provide research funding schemes and facilitate the setup of research centres in order to analyse the demand and supply of palliative care, and facilitate new and innovative interventions to improve the quality of service.

CONCLUSION

Palliative care service in Hong Kong is becoming more comprehensive and diverse. However, Hong Kong is only positioned at 22 in the 2015 Quality of Death (QOD) Index. [18] When comparing with other developed eastern economies such as Taiwan, Japan and Korea, Hong Kong is still lagging behind in meeting the international standard in palliative care. As reported in the 2015 QOD Index by Economist Intelligence Unit, Hong Kong was at low positions in terms of spending on healthcare and policy evaluation, and the capacity to deliver palliative care services, and public awareness of palliative care. With the growing ageing population and prevalence of chronic diseases, there is a service need to develop long-term care planning in palliative care involving the government, hospitals, hospices, palliative specialists and the community.

The most recent public consultation concerning EOL legislative proposals launched by The Food and Health Bureau (FHB) is to revise the current common law position in respect of AD. With a more comprehensive legislation on AD, conflicting regulations can be avoided and patients' right and interest on dying in place can be respected. The amendment of AD can also help to give an impetus on the development of more palliative day care centres, hospices and even palliative care home service as people may decide to remain at home when approaching their EOL.

The School of Professional Education and Executive Education of The Hong Kong Polytechnic University began to offer a new elective subject of "End of Life Issues" to the final year top-up undergraduate programme in Health Studies in the academic year of 2018-2019. The subject has attracted the interest and attention of the students, who presented their projects at the Research Seminar at the Jockey Club Home for Hospice in April 2019.

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GREEN BURIAL IN HONG KONG

Cynthia S. Y. Lau¹, Hilary H. L. Yee¹, Tommy K. C. Ng¹, Ben Y. F. Fong¹

1. School of Professional Education and Executive Development, The Hong Kong Polytechnic University, Hong Kong

Correspondence: cynthialau1227@gmail.com

ABSTRACT

Green Burial is a burial method which uses biodegradable materials to entomb the dead body instead of cremating by using embalmed liquid. It aims to let the body return to the nature naturally. With an ageing population, there is an increase of demand on columbarium and niches in Hong Kong, and green burial has been introduced as a more sustainable option to bury the deceased. The current paper has summarised the official documents regarding the green burial programme proposed by the Hong Kong government. The reason why people do not prefer green burial may be due to the Chinese traditional belief and the lack of education. Methods of delivery of message and social media coverage are issues leading to people not being encouraged to use green burial. United States and Singapore develop improved approaches in performing green burial. The effect in promoting green burial services is evaluated in this study and recommendations on improving the way of promotion are proposed.

KEYWORDS

columbarium, niches, green burial, project management, scattering ashes

INTRODUCTION

In the last three decades, the situation of ageing population has become more serious. The Census and Statistics Department has stated that the percentage of

elderly who are above 65 years old in the population has increased from 14.2% in 2013 to 17.0% in 2018. The birth rate has decreased from 8.0% in 2013 to 7.2% in 2012 but the death rate has increased from 6.0% in 2013 to 6.3% in 2018. With an ageing population in Hong Kong, the demand for niches and columbarium facilities will also be increasing, and more supply will be required. [1]

Columbarium is a place where people place the ashes of deceased. It gives a site for family members to show their respect and pray during memorial days. After the dead body is cremated, the niches or ashes are placed into an urn and sealed. The urn is then put into the public or private columbarium for praying by family members. According to the statistics estimated by the government Research Office, the average number of deaths will increase from around 45,000 in 2018 to 72,500 in 2037 while the number of cremations will also increase from 42,000 in 2018 to 68,000 in 2037. Although the government has opened three new public columbarium facilities during 2012 to 2014 and regulated private columbaria licenses, the supply of niches remains a concern. [2] Therefore, the government has started to promote green burial, a sustainable and eco-friendly method to deal with the ashes of the dead. People can scatter the ashes at 12 Gardens of Remembrance (GoR) operated by Food and Environmental Hygiene Department (FEHD) or at sea. The number of scattering ashes in GoRs and at sea has increased from 335 to 6,558 from 2007 to 2019. [3,4] However, not everyone accepts this new way of burial as it clashes with the Chinese traditional view on burying their deceased family members in a 'safe place'. It still needs time for the general public to accept it.

GREEN BURIAL

HISTORY AND DEVELOPMENT OF BURIAL SERVICE

Embalming and burial service was first established in the United States during the Civil War. Many soldiers went to the war, that had caused many deaths. To preserve the deceased individuals for transportation, embalming fluid was put on their dead bodies. Hence, burial service started to develop and the first cemetery for military was built in United States. [5]

In the traditional conventional burial, bodies are buried underground inside a concrete grave liner. [6] This kind of burial contributes to environment pollution as the decomposition of dead bodies will slowly create greenhouse gas methane. Pollutants are also generated by the manufacture of embalming fluids, caskets and grave liners. This method requires a large amount of land for the cemeteries, thus destroying natural green area. Whereas another option is cremation in which the dead bodies are burnt at a very high temperature and then pulverised into ashes. During the process of cremation, carbon fuel consumption generates carbon dioxide, which is emitted into the atmosphere, causing pollution to the environment.

In order to obtain a more environmental-friendly and sustainable way to handle human dead bodies, green burial was then promoted in the early 1990's in United Kingdom. They promoted green burial in order to save lands for development as well as to protect the environment. This practice has been widespread to other countries such as United States and Canada for reference and promotion. [7]

PRINCIPLES OF GREEN BURIAL

Green Burial is a burial method which uses biodegradable materials to entomb the dead body instead of cremating by using embalmed liquid. It aims to let the body return to nature naturally. It is carried out differently around the world. Green Burial Council of the United States considers burial as 'green' as long as it cares for the dead with minimal environmental impact that helps in the conservation of natural resources, reducing carbon emissions, protecting workers health and restoring and/or preservation of natural habitat. [8]

In Western countries like the United States and Canada, green burial is also called natural burial in which the dead

bodies will not be cremated with embalming liquid. They are put into a biodegradable shroud or coffin and, buried without putting the vault on the top. While in Hong Kong, due to scarce land resources, green burial is promoted as a more environmental-friendly and sustainable way of handling human ashes which are scattered either in memorial gardens or at sea.

Apart from being more environmental-friendly, green burial also aims to finish the decomposition of the whole body and let it return naturally back to the soil and the nature. [9] The decomposition of the dead body will become the local ingredients of the natural plants. This can have a bigger and better local ecosystem in the interment place where the body and body ashes are buried. Besides, green burial will not place artificial memorials in the buried place. Most of them will place some memorials which are made by natural material and have a simple description. [7]

GREEN BURIAL IN HONG KONG

APPLICATION PROCEDURE

There are two types of green burial services provided in Hong Kong, including scattering the ashes at the twelve GoR or into the sea. The application of performing green burial is free of charge but descendants must obtain the "Permit to Take Away Cremated Ashes" of the deceased if they would like to scatter the human ashes.

For scattering the ashes at the GoR in the city, relatives have to submit the original of the "Permit to Take Away Cremated Ashes" to one of the Cemeteries and Crematoria Office. For the GoR in the islands, they must obtain a document issued by the respective rural committee and the statutory declaration which can prove that the deceased was a villager of the island district, i.e. a local resident who lived there for a long period of time. If the deceased is the child of parents who are the villagers of the island district, the ashes can also be scattered at the GoR in the islands. The office will return the result of permission within 5 working days (Appendix I). [10]

For the scattering the ashes at sea, the family can arrange their own vessel trip or use the free ferry service provided by the FEHD to the three designated areas for scattering. After that, they should fill in the corresponding application form for scattering of cremated human ashes and submit it to one of the Cemeteries and Crematoria Office together with the original of "Permit to Take Away Cremated Ashes".

The office will return the result of application within 5 working days (Appendix II). [10]

ADVANTAGES OF PROMOTING GREEN BURIAL IN HONG KONG

One major advantage of promoting green burial is to avoid the construction of large piece of land to bury the dead bodies or to store funeral urns. Hong Kong is facing a huge challenge in finding places for the storage of the ashes of the dead as the current six government crematoria and eight of the nine public columbaria are nearly saturated. [11] Despite the government has promised to set up six more columbaria which can provide at least 300,000 niches to the public in the coming five years, the supply can barely meet the demand, as reflected from the waiting time of one month to 99 months for niches arrangement. [12] In green burial, only green area in memorial gardens is required. This helps to ease the pressure of finding suitable land for building more columbarium. Hence, the government can reserve more land for urbanisation or city development.

Green burial is cost effective and can reduce carbon footprint. Although cremation is still being adopted in Hong Kong and is releasing certain amount of carbon dioxide to pollute the atmosphere, resources like copper, concrete, steel and wood for producing caskets or coffins will be saved. [10] This helps to lower additional expenses on embalming or manufacturing metal vaults for cremation and also protect the environment by producing fewer toxic gases like carbon dioxide, sulphur dioxide, dioxin and nitrogen oxide.

After scattering the ashes into the ground or sea, they will become a part of the life cycle of nature and in line with a purpose of letting the deceased to return to nature. They will act as natural ingredient to help the plant grow. Plants can receive the nutrients and the native areas are preserved.

PROMOTION OF GREEN BURIAL IN HONG KONG

FEHD has a designated website to introduce green burial to the public. A memorial website of the deceased has also been developed. The family can establish a memorial web page to pay tribute to the deceased anywhere and at any time. A mobile application version with more function keys is being developed. [2] Posters, banners and leaflets are displayed in the public transportation system, hospitals and

Cemeteries and Crematoria Office. Seminars and exhibitions are organised in conjunction with tertiary institutions and non-government organisations. Furthermore, some promotion video clips are produced and broadcast in different media.

Starting from 2019, the government has launched a trial programme with tours of scattering ashes at sea. It gives people a chance to experience and be familiarised with this service. The tours are arranged on the last Saturday of each month with application beforehand. A guide will explain the process of green burial at the sea. Moreover, people can register for having green burial when they are still alive. [13]

ISSUES ON PROMOTION

The messages of green burial are not delivered to the public effectively. A report by Legislative Council [2] has criticised the accessibility of materials in the internet and public transportation system. Despite the availability of various types of promotion activities and different kinds of promotion materials such as leaflets and booklets provided by FEHD, the publicity for green burial is still limited. People must surf on the internet when their family or relatives passed away. Other than the thematic website of green burial, details and information are hard to be accessed.

Education on green burial, as well as on life and death, for the young generation is not enough. In the education curriculum, there are no specific life and death topics or courses. Most of the young start having death education in universities and there are few universities that conduct death education courses. A study has found that university students in Hong Kong have negative feelings and strong avoidance of death before having any death education courses and they think that life and death have weak correlation. They changed their attitude to slightly positive after having completed death education courses. [14] Although the government has organised talks and exhibitions on green burial, most of them are held at housing estates, elderly centres or old age homes. This has limited to target elderly group only. The talks held in secondary schools and the set-up of one-time promotion booth at the Health Education and Resource Centre of FEHD are not effective and cannot spread the messages validly due to the short duration and difficulty to inspire young people.

Moreover, traditional Chinese belief and culture are important factors that influence the public acceptance of

green burial. Complying with all the rules and rituals of funeral are important as proper funerary ceremonies could ensure a good transition to the afterlife for the dead. [15] People believe that the quality of afterlife of the deceased is also affected by the funerary procedures and ceremonies which demonstrate the respect and worship from family to the deceased. The next generation follow the routine to sweep the tomb and pray in the ceremony in order to make good wishes for both the deceased and family members, especially in Ching Ming Festival and Chung Yeung Festival, which are traditional Chinese festivals in spring and autumn each year respectively for family members to express their filial piety to the deceased with grave-sweeping.

Scattering ashes and sea burial are considered as disrespectful to the deceased and violating the tradition of giving a 'home' to the ancestors as they are just being randomly left all over the place. Online memorial webpage is the new way of memorial service promoted along with green burial. This is even more hard to be accepted by the general public, especially the older generation, as people pay tribute and show condolence only through the internet. The dedicated memorial webpage shows the name and date of death of the deceased and people can design the layout and set up different features for it. This has replaced the traditional worship ritual and broke the practice of the long-time Chinese tradition.

PRACTICE IN OTHER COUNTRIES

Green Burial has been popular in these few decades over the world. Some countries continue modifying their practice with new ideas.

United States

The United States uses green burial as a nature conservation tool to protect their natural places. There are 7 green burial sites across the United States and mainly located in the east and west part of the whole country. Since contemporary burial leaves much metal being disposed into the soil, green burial uses paper, banana leaf or bamboo to be the casket and without doing any embalming on the dead body. The burial places can gain more nutrients, so the government can find more open space and reserve natural habitats. It can also increase the biotic diversity to let animals and plants have better concentration. Since the area of these burial sites are large, they can provide wildlife corridors and protect the ecosystems. Some areas are listed as protected meadow,

protected forest and mountain heritage area. [16] This is a win-win-win situation for both human, animals and the environment.

Singapore

The National Environment Agency [17] under the Singapore government launched a new green burial method in 2007 called Crypt Burial System (CBS). It is an improved version of traditional soil burial where burial places are made by a crypt without a base and lay out in grids. This method can utilise the land more effectively and prevent graves shifting because of erosion or the soil movement. They put the ashes of deceased into a biodegradable urn and then place underground or scatter the ashes directly to the ground. People can perform it in any green burial sites approved by National Environment Agency and use different grave markers to locate the site like plants, GPS system or 3D objects.

POLICY AND PRACTICE OF GREEN BURIAL – THE WAY FORWARD

The government should evaluate the green burial policy in two to four years. Evaluation monitor and knowing the service satisfaction of the citizens are important in the development and management of a promotion project or a new policy. Research centres could be set up or universities can be engaged to conduct surveys on the usage and public preference on green burial. This facilitates the government in getting clearer views on recent utilisation, the limitations and progress by knowing how and why people choosing green burial at the last stages of their life. Then the FEHD can have a better plan to re-design the current promotion and to have a better scheme on the services of green burial.

Promotional materials such as leaflets and advertising videos should be distributed and broadcast more frequently in hospitals, day care centres and in different social media such as Instagram, YouTube, Facebook, etc. to increase publicity. Moreover, posters and banners can be displayed in relevant after-death service department to introduce an alternative option of burial. The government can also collaborate with radio broadcast or television companies to produce programmes about the detail of green burial. These actions aim to arouse the curiosity, awareness or concern on green burial in the public.

Also, the government should educate teenagers about this concept. In the secondary education syllabus, life

education lesson can let them know about the prevention and risk of suicide. The Education Bureau can introduce a section at school about the human life cycle. It can guide students to start thinking about the meaning of life and promote the knowledge of green burial. Students can then share what they have learnt about green burial from school with their families and friends to raise their interest.

The government can provide subsidy in memorial products. Memorial diamond and crystal are popular memorial products in western countries. Yet, there are only few companies in Hong Kong provide this kind of service. The cost of this service is expensive because of the special skills in making crystal or diamond. The government can subsidise those who would like to have the memorial diamond or crystal after scattering the ashes at the GoR or at the sea. It can also help to promote green burial to the citizens.

Moreover, the government can offer more places for scattering the ashes. They are extending the areas in the present twelve GoR and building up more memorial plaques. Descendants can still have the traditional routine in Chung Yeung Festival or Ching Ming Festival and pray for the deceased in front of the plaques. This method should be emphasised more by the government as it can maintain the balance between tradition and modern practice and make it more acceptable to the public.

CONCLUSION

The demand for columbarium facilities and niches has been increasing continuously due to the ageing population and uptrend in the number of deaths. The supply of niches is under pressure and has aroused the concern about its adequacy in coming years. To ease the shortage of niches, the government has promoted a new method on the afterlife of deceased called green burial. However, it is facing obstacles in getting people to accept this alternative burial as it is a traditional practice in Hong Kong to keep body ashes of the deceased in ceramic urns and store them in columbarium niches. The government must improve the way of promoting green burial by conducting more education talks in schools and to the public and increasing promotion through social media. Then, people can gain more information and

understanding about it and encourage them to consider green burial.

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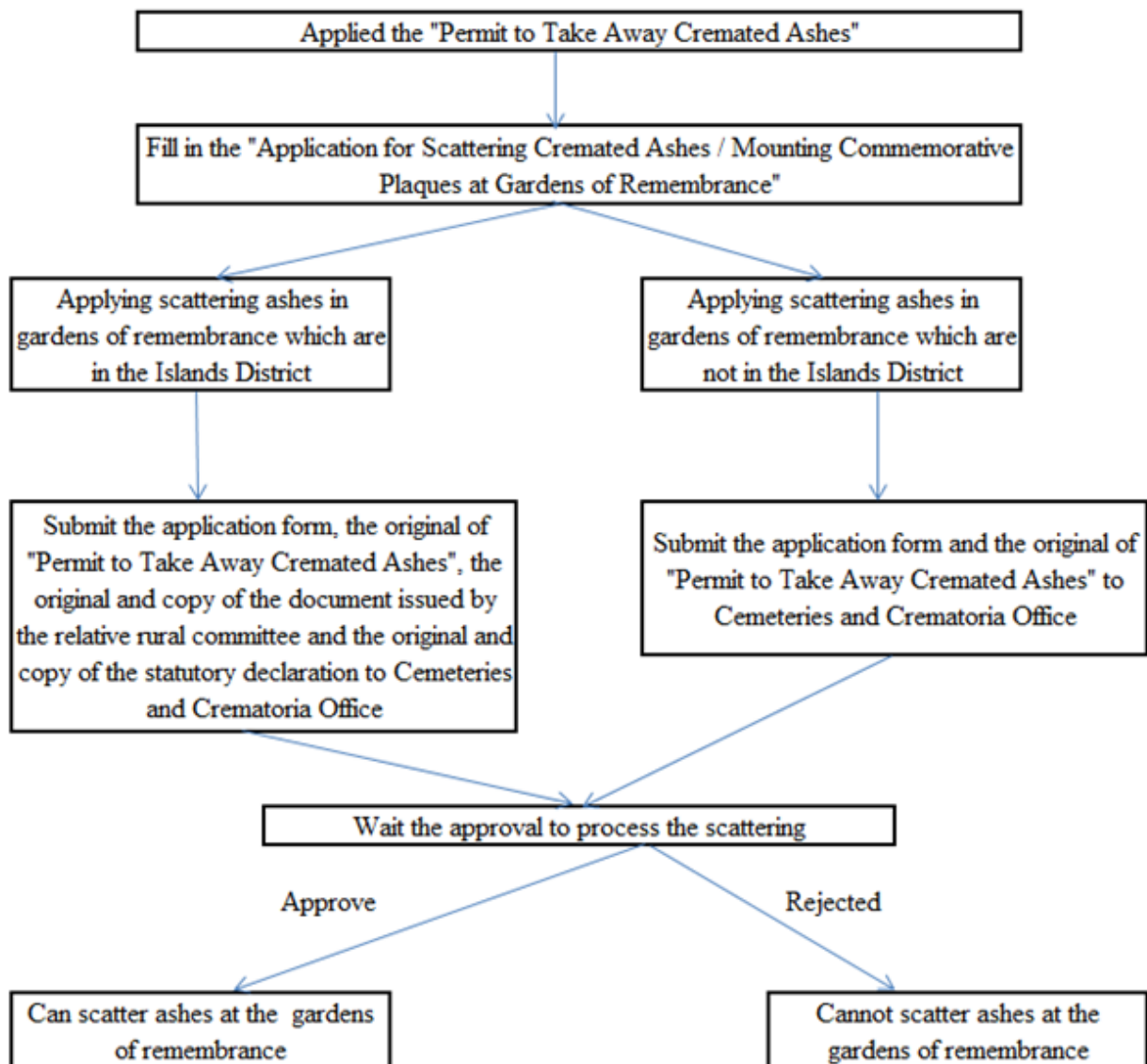
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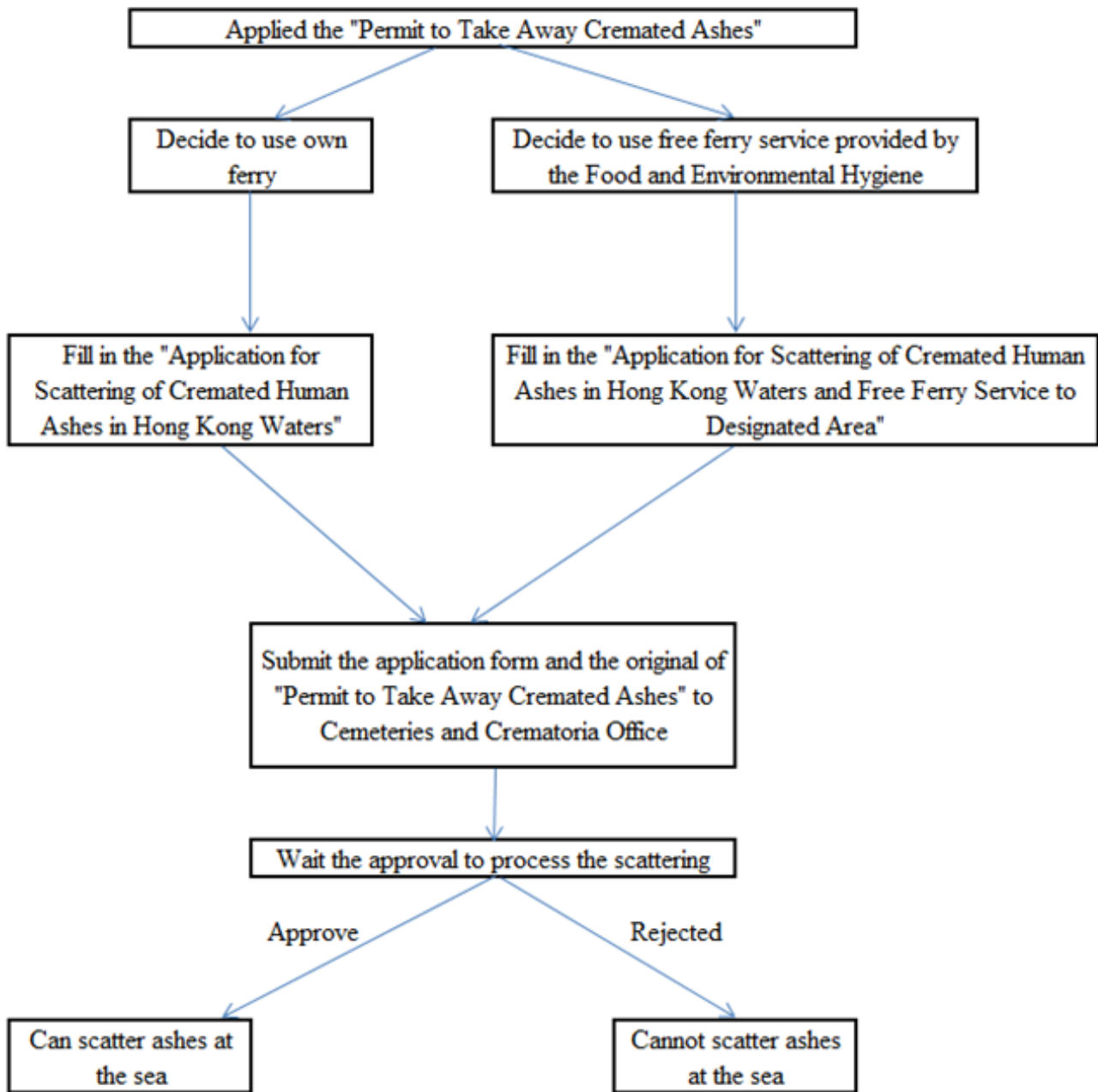
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APPENDIX I: PROCEDURE FOR THE APPLICATION OF SCATTERING ASHES AT THE GARDEN OF REMEMBRANCE [10]





THE DEPLOYMENT OF VIRTUAL REALITY (VR) TO PROMOTE GREEN BURIAL

Yui Yip Lau¹, YM Tang², Ivy Chan¹, Adolf K.Y. Ng³, Alan Leung⁴

1. Division of Business and Hospitality Management, College of Professional and Continuing Education, The Hong Kong Polytechnic University
2. Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University
3. Department of Supply Chain Management, Asper School of Business, University of Manitoba, Canada
4. Faculty of Business, Law and Tourism, Sunderland University

Correspondence: yuiyip.lau@cpce-polyu.edu.hk

ABSTRACT

Population projections for Hong Kong suggest that the city will accommodate 8.22 million people in 2043. One in every three people are expected to be older than 65 in 2066. The long-held Chinese traditions for burial of deceased with reverence and honour, coupled with the chronic land shortage have presented an excessive demand for cemetery space. Niches are seldom recycled, and the inadequate supply of new columbarium niche requires the family of the deceased to consider an alternative way for keeping cremated ashes. To ease the demand, "green burial" has been launched and promoted by the HKSAR government through different print and social media. Currently, scattering of cremains in Gardens of Remembrance or at sea are the two common ways to perform green burial. The public acceptance of green burial is still questionable and is under-researched.

This study is going to deploy innovative technology, virtual reality (VR) to increase physical and psychological fidelity in highly resembled scenarios for the people. On one hand, VR gives immeasurable value to people when they are enabled to navigate different circumstances (physical fidelity) before considering the use of green burial. On the other hand, VR enables the people to engage in different mental processes (psychological fidelity) replicated from an array of cognitive reaction and sentiments with the choice of green burial. In order to optimize the

configuration of the VR settings, we will conduct a face-to-face, semi-structured and in-depth interview with different practitioners. In the study, we explore: (1) To what extent the enhancement of physical fidelity of innovative technologies debunk public's misconception of green burial? (2) To what extent the enhancement of psychological fidelity of innovative technologies debunk public's misconception of green burial? (3) To what extent the simulated experience derived from innovation technologies change the public acceptance of green burial?

KEYWORDS

green burial; virtual reality; physical fidelity; psychological fidelity

INTRODUCTION

In Hong Kong, the current population has almost reached 7.4 million. The population growth rate will be at 0.6% in the forthcoming years. By 2043, the population in Hong Kong is expected to reach a peak of 8.22 million. We expect that elderly persons will make up around 30% of the total Hong Kong population. [1] The male life expectancy will

significantly increase from 67.8 years old in 1971 to 87.1 years old in 2066. The expectation for female life expectancy will also rise from 75.3 years old in 1971 to 93.1 years old in 2066. This dramatic growth of aging population is a severe challenge. With the population ageing along with unexpected infectious disease will lead to a number of deaths and the overall mortality rates will exhibit a rising trend in the forthcoming years. [2, 3] The long-held Chinese traditions for burial of deceased as reverence and honour, coupled with the chronic land shortage have presented an excessive demand for cemetery space. In addition, niches

are seldom recycled, and the inadequate supply of new columbarium niche forces the family of the deceased to consider alternative ways for keeping cremated ashes. In the past few decades, the number of cemeteries in Hong Kong has remained the same. Clearly, the numbers of cemeteries are insufficient to meet the future demand. The situation of handling the deceased has reached a bottleneck. The number of deaths and cemeteries in Hong Kong are listed in Table 1.

TABLE 1: NUMBER OF DEATHS AND CEMETERIES IN HONG KONG (2014-2018)

	2014	2015	2016	2017	2018
Number of deaths	45087	46108	46905	46829	47400
Public cemeteries	8	8	8	8	8
Private cemeteries	30	30	30	30	30

Source: Food and Environmental Hygiene Department, HKSAR (2020)

To ease the demand, green burial has been launched and promoted by the HKSAR government through various print and social media. Such promotional ways and tools created a limited impact on the public awareness. Currently, scattering of cremains in Gardens of Remembrance or at sea are the two common ways to perform green burial. The public acceptance of green burial, however, is still a questionable issue as well as green burial is under-researched. To this end, our study is going to propose the adoption of innovative technology, namely virtual reality (VR) to improve physical and psychological fidelity in highly resembled scenarios for the people. On one hand, VR gives immeasurable value to people when they are enabled to navigate different circumstances (physical fidelity) before considering the use of green burial. On the other hand, VR enables the people to engage in different mental processes (psychological fidelity) replicated from an array of cognitive reaction and sentiments with the choice of green burial. [13, 14] In the study, we investigate: (1) To what extent the enhancement of physical fidelity of innovative technologies debunk public's misconception of green burial? (2) To what extent the enhancement of psychological fidelity of innovative technologies debunk public's misconception of green burial? (3) To what extent the simulation experience derived from innovation technologies change the public acceptance of green burial?

This paper is divided into six main parts. After the introduction in Section 1, we discuss the operation of handling human cremains in Section 2. In Section 3, we describe the research methodology. After that, we explore the concept of green burial and the current situation of green burial in Hong Kong in Section 4. The deployment of VR in green burial and conclusion are provided in Sections 5 and 6, respectively.

THE OPERATION OF HANDLING HUMAN CREMAINS

1. THE HANDLING OF DEATH FROM NATURAL CAUSES AND UNNATURAL CAUSES

Starting from the case being created when a live body becomes human remains, the funeral operators need to identify or investigate that the death has been certified by a duty houseman in a hospital (i.e., natural cause) or unable to be certified by a duty houseman in a hospital (i.e., unnatural cause). At the beginning, the funeral operators are required to sort out the death from natural and unnatural causes for two main reasons. Firstly, all documents requirement and handling procedure are completed. Secondly, the Chinese traditional customs emphasize that the dead body should be in a quiet and calm environment where it fosters the soul to be free to go and return.

All unnatural cases are required to be sent to a public mortuary to wait for dissection by a forensic doctor. The family of the deceased strives to avoiding the dissection because of their showing respect and love. This concept comes from Confucius – The Classic of Filial Piety: 'Our bodies, to every hair and bit of skin, are received by us from our parents. We must not presume to injure or wound them'.

According to the public health and municipal services ordinance (Hong Kong Law Chapter 132), the hospital houseman will issue a medical certificate for cremation once the case can be certified. It clearly describes that the deceased person was carefully examined that the death was not due to a poison, violence or any illegal operation or to privation or neglect the deceased person is fitted or not fitted with a cardiac pacemaker, and or with radioactive or other implant. The deceased person will be received for dissection in the place of public mortuary. Police and the coroner court will also be involved.

2.THE ARRANGEMENTS OF CREMATION AND BURIAL

In 2019, there were more than 120 licensed undertakers and 7 licensed funeral parlours in Hong Kong. [4] In some cases, religious venues are listed as the licensed funeral hall where it allows handling of human remains for its family of deceased. [5] 90% of the family of the deceased used cremation services with six public crematoria. Each crematorium needs to handle 21.6 cases per day in office hours. For the reason of saving money or keeping in a low profile, there is an increasing trend of families of the deceased selecting a short and simple farewell memorial rite with respect in a hospital's farewell room.

RESEARCH METHODOLOGY

In our study, we mainly employed a qualitative approach. Specifically, the researchers carried out 18 semi-structured, in-depth face-to-face interviews with the main personnel concerned with the development of green burial in Hong Kong. Due to confidentiality agreements, the interviewees' particulars are excluded in the study. The interviewees included funeral logistics firm, funeral service providers (e.g., cemeteries, funeral director), a religious group (e.g., Catholic, Priest, Christian, Pastor, Buddhist), health service professionals (e.g., rehabilitation therapist, elderly home), secondary school teacher (e.g., religious education),

counselors, and general public (e.g., family of the deceased, boat people who is living on boats).

The interview questions focused on exploring the major consideration in choosing between green burial and traditional burial; further promotional strategies to increase the public awareness of green burial; and the simulation experience derived from innovation technologies (i.e., VR) (i.e., contents, special effects, layout design, and scenario) to change the public acceptance of green burial.

THE CONCEPT OF GREEN BURIAL

Since 2010, the concept of green burial has emerged in Hong Kong. Green burial aims to promote sustainable development and align with the beliefs of beautiful life returning to nature. [5] The Food and Environmental Hygiene Department (FEHD) performed green burial through scattering of cremains in Gardens of Remembrance or cremated ashes at sea. The FEHD has continuously expand green burial facilities and services in the last decade. Family of the deceased can select to scatter the cremated ashes of their loved ones at the Gardens of Remembrance themselves or with the aid of assigned staff of FEHD.

The documents and interviewees pointed out the rationale behind selecting green burial. The dramatic growth of population together with the scarce land resources in Hong Kong, increased the waiting time of public niche and burial. The interviewees highlighted that an average waiting time in Hong Kong for a public niche to hold cremated remains is four years. Funeral operator Kenneth Leung reinforced that the shortage in public niches would rise from 215,145 in 2019 to 398,145 in 2023 (South China Morning Post, 2016). The advancement of technology encourages delivering the green burial message more easily. To a certain extent, family members of the deceased perceived that they are a responsible and environmentally friendly citizen after using the green burial. The deceased family member expressed that green burial could help going back to the natural world (i.e., ashes to ashes, dust to dust) without posing any burden (time and financial). From the Buddhist perspective, we are connected whenever we go to the memorial garden. Trees and plants are grown well which is equivalent to a sense of belonging.

The interviewees also highlighted that the family member will face the complex procedures when it compulsorily requires the removal of human remains from graves which have been interred in the public cemeteries for over six years. In the case of remains not exhumed after expiry of the exhumation order, the Government will, disinter them, cremate the remains and re-inter the ashes in the Communal Grave. [5] In other words, traditional burial creates a serious problem of unclaimed bodies. Besides, the migration problem and the distant relationships with the family and relative members lead the citizens to revisit and

think about the use of green burial rather than traditional burial. Thus, the interviewees addressed that the green burial would make them more comfortable in the afterlife.

On the other hand, the green burial still fails to become mainstream and develops relatively slow progress. The public acceptance of green burial is still a questionable issue. In 2016, the Office of the Ombudsman criticized that the FEHD implemented an ineffective green burial serviced. In Table 2, the usage of green burial service between 2016 and 2018 is described.

TABLE 2: THE USAGE OF GREEN BURIAL SERVICE IN HONG KONG (2016-2018)

YEAR	SCATTERING OF CREMAINS IN GARDENS OF REMEMBRANCE*	SCATTERING OF CREMATED ASHES AT SEA	TOTAL NUMBER OF GREEN BURIAL SERVICE*	PERCENTAGE OF TOTAL DEATHS	TOTAL NUMBER OF CREMATION	TOTAL NUMBER OF BURIAL
2016	4466	900	5366	11.5%	43556	3253
2017	5573	966	6539	14.3%	42809	2962
2018	6074	972	7046	14.8%	43803	3136

Sources: Finance Committee, HKSAR (2019)

*Remark: The data includes private cemeteries

During the interview process, the majority of interviewees indicated that they do not understand the concept of green burial due to (1) ineffective promotional tools and channels; (2) a few of friends, and colleagues introduce the advantages of green burial service; and (3) a lack of communication between parents and children about death. Indeed, the interviewees highlighted that either scattering of cremains in Gardens of Remembrance or scattering of cremated ashes at sea make people perceived it to be in disrespect, frivolous, and easily forget to worship. Most importantly, the interviewees worried about the unprofessional manner in mixing up of their ashes with others will happen by FEHD in green burial operation.

Much of the reluctance is deeply rooted in tradition. From the Chinese traditional idea, green burial fails to preserve the whole-body afterlife and performs a 'shabby' funeral ceremony. The religious beliefs reinforce that we should respect the ashes of dead bodies. It is because from the Catholic and Christian perspective the Confirmation from the Holy Spirit, the body has become the Palace of the Holy

Spirit. Thus, the ashes should be stored and preserved in precious vessels. The ashes of the dead bodies are required to be buried in graves, mausoleums or ashes. It is not a respectable way to lay the ashes of the dead bodies on the sea, in the air, on the ground, and preserve them in the homes of family, relatives, and friends of the dead. In order to ease the shortage of niche and burial, Catholic Diocese of Hong Kong not only expands the land area of cemeteries, but also allows merging of the whole family member within the same niche or burial.

Furthermore, funeral logistics firm, funeral service providers expressed that the rise of green burial will affect the profit of the cemetery and coffins. In the traditional burial, the family of the deceased normally select solid wood coffin or fragrant wood coffin. The ranges of prices are between HKD 2 million and 3 million. In the green burial, eco-coffin will be charged from HKD 6,000 to HKD 0.2 million. Besides, some aspects (e.g., exhumation services) will gradually reduce and eventually lead to unemployment problem in the future.

DEPLOYMENT OF VIRTUAL REALITY (VR): GREEN BURIAL

1. DEVELOPMENT OF DESIGN OF VR

The authors propose to deploy the green burial with VR: (1) The VR program not only will allow the public to experience the context under controllable conditions, but it will also provide a safe environment for them to understand green burial; (2) The program can be conducted repeatedly without the need to demonstrate with real situation that may be undesirable to the public; (3) It eliminates wasting of resources involved in real cases that meet the spirits of green; and (4) The VR program allows the simulated environment to provide a natural feeling.

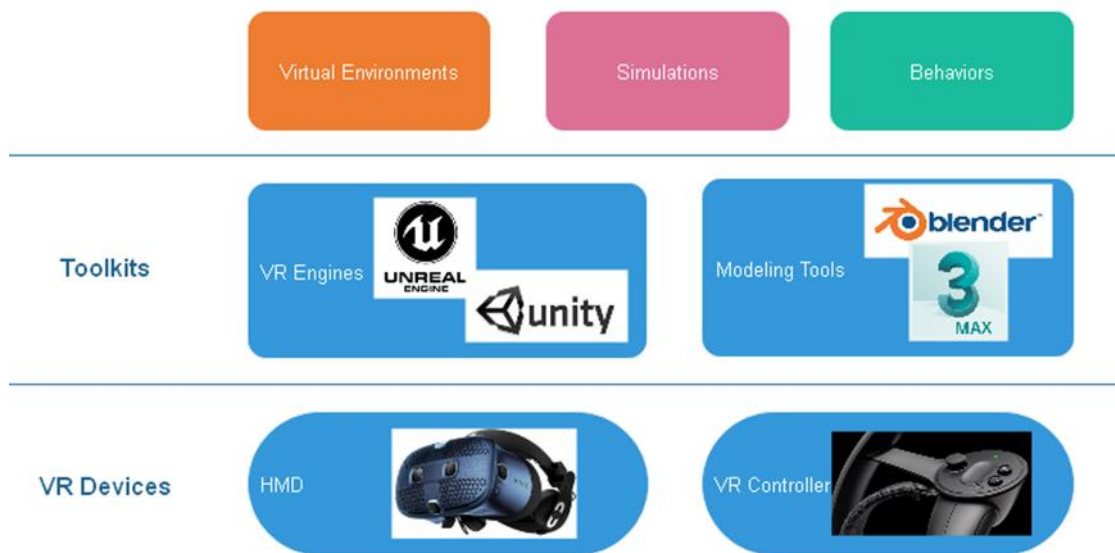
Figure 1 illustrates the workflow of the deployment framework of the VR for green burial. In our development, the process is divided into 9 major steps as follows:

1. Investigation of green burial scenarios
2. Meeting with stakeholders to understand the details of green burial
3. Onsite visit and measurement for the green burial environment
4. Taking photos
5. Computer modelling
6. Assign texture and materials for the VR models
7. Computer programming in major VR Engine
8. Simulation of green burial scenarios
9. Testing and Evaluation

FIGURE 1: THE WORKFLOW OF THE VR FRAMEWORK



FIGURE 2: THE BLOCK DIAGRAM OF THE VR PROGRAM DEVELOPMENT



In this research, there are several key issues including content design, computer programming and project dissemination. In order to design the content, several steps are involved. The green burial scenarios are firstly formulated. The scenarios are used to deliver the green burial messages to the participants; thus, it should be well-designed in the initial stage. For instance, the virtual environments and objects involved, what experiences to be delivered to the participants, any required interaction, to name but a few. Then, developers of the VR program are required to meet with the stakeholders in order to understand the expectations of the participants and other details of the green burial. To enhance the visual realism of virtual environments and objects in green burial in order to provide a realistic experience to the users, the developers are required to perform onsite visit, taking photos and measure the dimensions of real objects. Finally, computer modeling will be conducted to build the virtual environments and 3D objects involved in the VR program. Finally, lighting for the virtual scenes, materials and textures will be assigned to the 3D models for rendering.

After the content design is completed, computer programming will be conducted to create the VR experience for green burial. Computer programming is a technical part integrating the physical models, virtual objects into an immersive virtual reality system. Sensors and trackers are used to track the position and orientation in the virtual environment, so that participants can interact with the virtual environments if necessary. The system allows interaction between the virtual objects and participants in

real-time. On the other hand, this procedure will also allow simulation of the inter-individual variation in the green burial scenario if necessary. Finally, in the project dissemination, simulation of various green burial scenarios will be conducted to investigate the effect of the VR program. We will conduct testing and evaluation on the VR program, and possibility of further improvement.

Figure 2 shows the block diagram of the VR program development. At the top layer of the VR development is some of the information that needs to be included in the program. It includes the virtual environments, simulation or animation to be included in the VR program, and the simulated behaviors of the virtual objects. At the middle layer, several software kits are required for the modeling and computer programming, common modeling toolkits include Blender, 3Ds Max, etc. Unreal and Unity are the most common engine for the development of the VR program.

The VR hardware includes the Head-mount display (HMD) and handheld controller. The HMD is used not only to provide stereoscopic images and audio effects to the user, but also used to determine the real-time orientation and position of the users. The real-time orientation and position are essential as it allows users to interact with the virtual objects by using the handheld controller if necessary. The devices will be connected to the computer through wireless network in order to stream the real-time scenarios and collect user's data for interactions.

2. PHYSICAL FIDELITY AND PSYCHOLOGICAL FIDELITY

Currently, FEHD promotes green burial by using traditional promotional tools and channels, for instance, poster, video, leaflets, newspapers, TV programs, and website. During our interview process, most of the interviewees addressed that these promotional tools failed to persuade them to change their mindset from using traditional burial to green burial. The rationale behind is that they are unable to perceive the value of green burial through the process and understand how the green burial generates the peace, joy and dignity after the end of life. Through using VR, it can foster green burial that creates physical fidelity and psychological fidelity to make people understand the birth and death process.

The prevailing skepticism within the medical community towards VR as training tool led to low acceptance in the 90's. [6] The advancement of IT facilitates the adoption of VR in healthcare and medical training and has been widely accepted with its positive impacts to improve patients' safety. [7] Previous studies showed that high-fidelity simulators improved users' understanding of a subject matter and led to better performance, such as reduction of the intraoperative errors [7] and learning effectiveness of medical students. [8] [9] The fidelity and resemblance simulated from the three-dimensional scenarios enable the physicians to assimilate their sensory responses and acquire skills in surgery and interventional cardiology.

Physical fidelity is defined as the degree of closeness that the conditions presented to users, such as physical settings or use of equipment mimic the authentic real contexts. [10] In the green burial VR simulation, users can experience the physical fidelity including the processes and embellishments involved in conventional cremation and green burial such as embalming chemicals to precipitate into the earth, carbon footprint of cremation. [11] The simulated context enables people to identify the association of green burial with sustainability and environmental-friendly practices.

Psychological fidelity is perceived as the extent of resemblance to which users are engaged in their mental and emotional processes under simulated situations mirroring the real world. [12,13,14] It is deemed that the messages or contexts presented to users, like the green burial, returning to nature in the proposed study can be delivered constantly and consistently. [7] Throughout the green burial VR simulation, users accommodate their

cognitive processes in response to the images and scenes attesting to cemetery or memorial gardens, while their emotional stance can be examined further. Their responses on the simulated environment can be tracked and measured in order to evaluate the changes in their cognitive or emotional acceptance of green burial. [7]

CONCLUSION

In the context of the Hong Kong funeral industry, the funeral service providers strive towards offering comprehensive, one-stop and tailor-made service to customers. Every part of the funeral activities or tasks is planned with an immaculate attention to detail. It includes venue arrangement, government document processing, ceremony planning, venue decoration, music, and even obituary and eulogy writing. Additionally, grief counseling, reception arrangements, post-funeral services, and memorial activities will also be offered. To our best knowledge, the personal relationships with clients, word of mouth, and reputation remain the determining factors for the funeral service providers to gain funeral business.

Land availability is very limited, traditional burial services become an expensive and precious process. To this end, green burial is an optimal solution in solving the urgent demand for scarce land resources as well as providing an economical way to ease a financial burden. Besides, the funeral service users now rely on the information technologies to obtain the updated funeral information, explore the new knowledge, and participate in counseling service. In doing so, VR enhances physical fidelity and psychological fidelity of innovative technologies debunk public's misconception of green burial. In order to promote green burial by the deployment of VR, exploration of the right timing, appropriate promotional channels, and right people are crucial. In terms of right timing, FEHD can promote it during Chung Yeung Festival in October and Ching Ming Festival in April. Such two regular festivals are Hongkongers' customs to visit a grave. In terms of the right promotional channels, FEHD can collaborate with elderly home to give more information to the elderly and their parents/relatives. Also, FEHD attempts to engage with religious groups, secondary schools and tertiary institutions to deliver life education to address the value of green burial by the adoption of VR. Green burial may be appropriate to deliver a message to young generations, persons who take care of elderly, and the person who is eligible for senior citizen card (i.e., aged 65 or above).

Because green burial is a new concept to the Hong Kong citizens, it is sensible that we need time to make the public gradually accept green burial by the VR deployment.

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ACTIVE AGEING MANAGEMENT IN IRAN: DESIGNING A MODEL

Zeinab Gholipour, Mahmood Mahmoodi Majd Abadi Farahani, Leila Riahi, Kamran Hajjabinabi

Department of Health Services Management, Sciences and Research Branch, Islamic Azad University, Tehran, Iran.

Correspondence: Mahmoodim@tums.ac.ir

ABSTRACT

OBJECTIVE

Active ageing constitutes one of the guiding perspectives on policies, but the factors influencing ageing have not received considerable attention. The present study aimed to identify the factors affecting active ageing management in Iran.

DESIGN

Drawing on quantitative data gathered through a questionnaire filled out by 287 participants and an interview with 20 experts.

MAIN OUTCOME MEASURES

The instrument was a questionnaire based on the five-point Likert scale. Questions with $CVR > 0.49$ and with $CVI > 0.7$ were accepted. To assess the reliability of the questionnaire, Cronbach's alpha coefficient was (0.92) used. The adequacy of the sample size was estimated at 0.952, based on the Kaiser-Meyer-Olkin (KMO) index. The collected data were analyzed by SPSS Ver 22. An exploratory factor analysis was used to explore and evaluate the dimensions of the model through a mathematical approach. Also, confirmatory factor analysis was utilized to verify the model, using AMOS 24 software.

RESULTS

Eight factors were identified as effective factors in active ageing management in Iran, which include: Organizational structure (0/83), services (0/80), control (0/74), financing (0/72), government grants (0/71), policy making (0/68), selected area to focus (0/65), members (0/63).

Organizational structure and member components had the most and least significant effects.

CONCLUSIONS

Establishing a High Council with the presence of the President's representative, allocating a specific budget for the elderly, determining the responsibilities of the government and the related organizations, determining the responsibility and providing suitable services can lead to the effective management of active ageing.

KEYWORDS

elderly, active ageing, active ageing management, ageing financing

BACKGROUND

The 20th century has witnessed an unprecedented increase in average human lifespan as well as a rapid decrease in human fertility in many countries of the world. [1] Globally, the share of older people (60 years and older) incremented from 130 million in 1994 to more than 600 million in 2017; that is, it has increased from 4% to 10% during this period which is expected to reach 21% per se by 2050. [2] In Iran, the population of older people (60 years and older) increased from 7/3% in 2006 to 9/3% in 2016, and it is expected to reach 25% by 2050. [3] So, in the near future, we will see an 'aging explosion.' [4] What has been described as the trend of increasing population in the world and in Iran is not important in itself inasmuch as the fact that the economic and social consequences of this population

increment seem to be more crucial.[5] Ageing is a multidimensional phenomenon with political, economic, social, cultural, educational, welfare, physical, mental, and health dimensions that are intertwined as a chain. Therefore, we are mistaken if we rely solely on the health facilities and abilities to address ageing issues. [6]

These findings highlight several questions from both an individual and public perspectives. Who will take care of the current generation as we become older? What types of health and social organizations should we develop to preserve the quality of life of an ageing population and sustain our health care systems over the medium and long term? Supporting Active and Healthy Aging (AHA) is one answer to these questions.

AHA population is a resource that benefits society. Maintaining a healthy ageing population may also lower demands for health care services. In addition, in many cases, older adults in good health conditions are able to support their fellow generation. [10] It is postulated that active ageing is a multidimensional concept affected by several factors, including physical functionality, lifestyle, urban environment, and social inclusion. [7] Active ageing is a process of optimizing opportunities for health, participation, and security in order to enhance quality of life as people age [8] and healthy ageing is process of developing and maintaining the functional ability that enables well-being in older age. [9]

Older people contribute to society in many ways – whether it is within their family, to their local community or to society more broadly. [9] Therefore, policies should ensure that older people can continue participating in economic and community activities as they grow older, and that they can take care of themselves as long as possible, and this is the essence of an Active and Healthy Aging (AHA) approach [11] Most of developing countries in the world have perceived socioeconomic and health related complexities resulting from population transition called 'ageing nations', however, given the progressive growth of the elderly population, their problems also have increased so that a satisfactory solution has not been found yet for them. [12]

There are critically important issues related to the ageing society, such as future intergenerational relations and tensions, socioeconomic disparities and inequalities and its capacity to serve the traditional safety-net role, the impact of technology, and the critical importance of adaptation of core societal institutions, including education, work and

retirement, housing and even the design of the built environment. [13] There are five main reasons for policymakers to pursue the concept of active ageing with interest. These reasons include the ageing of the workforce, an increase in the early exit of labor, the need for social protection system sustainability, changing business needs, and political pressure to provide equal treatment and care. [14]

A comprehensive concept of active ageing can provide a framework for the development of global, national, and local strategies relating to population ageing. It has the potential to unify the interest of all the key stakeholders: citizens, non-governmental organizations, business interests, and policymakers. [15] The use of the experiences of advanced and successful countries in the management of the ageing population can be a guide and a suitable model for the relevant authorities. (1) Over the past two decades, 'active ageing' has emerged in Europe as the foremost policy response to the challenges of population ageing. [17] It is only in the last one and half decades that countries in Asia are facing a steady growth of the elderly, as a result of the decline in fertility and mortality, better medical and health care and improvements in the overall quality of life of people. [18] A review of the laws and regulations of the country of Iran shows that only 1% of laws passed are for the elderly, 62% of which are economic, 22% social, and 16% health and well-being. [2]

The status of hospitals and health care facilities in providing services to the elderly is severely weak in terms of staff, physicians, nurses trained to interact with the elderly, home visits and preventive measures. Existing policies on the health of the elderly have failed to achieve their goals; elderly policymaking has taken place regardless of the important underlying factors (such as human resources), community conditions and stakeholders. [3] And the elderly in Iran are not covered by any insurance organization as "elderly" unless they are insured as employed, retired, needy, disabled, and rural. [21]

OBJECTIVES

Resolving elderly problems is not the sole responsibility of an entity or organization and requires the combination of capabilities and involvement of all sectors, so establishing a coordinated body to plan elderly related activities as a strategic measure can be a strategy for improving elderly

support services. Consequently, the aim of this study was to identify the factors affecting active ageing management.

METHOD

This descriptive quantitative study was carried out in six phases in 2018. In the first phase, factors influencing active ageing management were identified and extracted through a literature search. In the second phase, a comparative study was conducted on the experience of the selected countries in active ageing management. A narrative review was used in databases of Pub Med, Science direct, Scopus, and Web of Science. In order to find more reports and documents, various databases such as the WHO, the World Bank, and the Google search engine were also examined. To this end, the relevant studies were checked using the key words "active ageing, elderly policy making financing, control, organizational structure, active ageing management, and ageing services. The study population was selected from countries with high aged population and available references. These countries included Norway, the United Kingdom (UK), Japan, Malaysia, Turkey, and Iran. The data obtained from this stage (literature review and comparative study) were classified using an information form, and duplicate data were removed. The important variables affecting active ageing management were classified into eight dimensions consisting of policy making, organizational structure, members' component, control, financing, governance grants, services, and selected area to focus which led to the development of a proposed model.

In third phase, an interview was conducted with 20 experts in the field of the ageing management. The inclusion criterion for experts was a minimum experience of 10 years in ageing management positions. The interviews continued until reaching data saturation, and analysis of the collected data from the interviews was carried out by content analysis.

In fourth phase, a researcher-made questionnaire with 41 items in eight dimensions, rated on a five-point Likert scale (from very low = 1 to very high = 5) was used to confirm the validity of the proposed model by a large number of experts. The face validity and content validity of the questionnaire was confirmed by 20 experts. Questions with $CVR > 0.49$ (Content Validity Ratio) and with $CVI > 0.7$ (Content Validity Index) were accepted. Furthermore, to

assess the reliability of the questionnaire, Cronbach's alpha coefficient was (0.92) used. In fifth phase, validation of the model was made by the stakeholders. The questionnaire was distributed among 287 samples, including experts of ageing management in the organizations related to the provision of active aging services such as ministry of health and medical education, ministry of cooperatives labor and social welfare (state welfare organization of Iran, insurance companies) and universities of medical science with 10 years of experience in the field of ageing. The sample size was determined using the Cochran formula, and sampling was carried out using cluster sampling method. The adequacy of the sample size was estimated at 0.952, based on the Kaiser-Meyer-Olkin (KMO) Kaiser Mayer Olkin index. The collected data were analyzed by SPSS 22 software. An exploratory factor analysis was used to explore and evaluate the dimensions of the model through a mathematical approach. The internal consistency of dimensions was estimated through Cronbach's alpha. In the last step, confirmatory factor analysis was utilized to verify the model, using AMOS 24 software.

RESULTS

According to the literature review, five countries were selected, including Norway, the United Kingdom (UK), Japan, Malaysia, and Turkey, and seven factors were identified including policy making, organizational structure, control, financing, governance grants, services, and members component. Table 1 provides an overview of the key characteristics of active ageing management in the selected countries. After comparative study, one more factor was added to the name of selected area to focus. In exploratory factor analysis, to categorize the items among the factors, based on their factor load, the rotated component matrix results were used.

Table 2 shows the correlation matrix between items and factors rotation, in which the correlation value varies from -1 to +1. Based on this table, the researcher, based on the largest factor load of each item, classified them according to the degree of correlation with each other. Classification of variables (items) in factors is usually based on the first variable of the factors and its implicit meaning. The Eigen values of the first and eight factors were 14.225 and 7.225, respectively. Besides, these eight factors could explain approximately 73.25% of the variance in the variables.

TABLE1- THE RESULTS OF LITERATURE REVIEW ON ACTIVE AGING MANAGEMENT IN SELECTED COUNTRIES

		FINANCING	MEMBER COMPONENT	SERVICES	GOVERNANCE	ORGANIZATIONAL STRUCTURE	CONTROL	POLICY MAKING	COUNTRIES	NO.
		*		*			*		The United Kingdom (UK),	1
		*	*			*	*		Norway	2
		*	*	*	*	*	*	*	Japan	3
		*	*	*	*	*	*	*	Malaysia	4
		*			*	*		*	Turkey	5

TABLE2- ROTATIONAL CORRELATION MATRIX AMONG ITEMS, ENGINE VALUES AND TOTAL VARIANCE EXPLAINED BY EACH FACTOR

ITEM	FACTOR 1	ITEM	FACTOR 2	ITEM	FACTOR 3	ITEM	FACTOR 4	ITEM	FACTOR 5	ITEM	FACTOR 6	ITEM	FACTOR 7	ITEM	FACTOR 8
q 3	0.821	q 5	0.715	q 10	0.660	q 14	0.632	q 19	0.697	q 21	0.547	q 25	0.536	q 32	0.497
q 1	0.814	q 7	0.713	q 11	0.653	q 15	0.600	q 17	0.634	q 22	0.542	q 24	0.532	q 37	0.492
q 4	0.803	q 9	0.702	q 12	0.620	q 16	0.584	q 20	0.612	q 23	0.540	q 26	0.530	q 33	0.487
q 2	0.792	q 6	0.690	q 13	0.619			q 18	0.604			q 27	0.527	q 36	0.471
		q 8	0.681									q 30	0.522	q 34	0.462
												q 28	0.517	q 35	0.450
												q 29	0.515	q 39	0.448
												q 31	0.502	q 38	0.431
														q 40	0.420
														q 41	0.409
total	14.225		14.036		13/125		12.136		11.096		10.174		6.854		7.226
% variance	14.902		12.851		11.236		10.337		9.897		8.574		7.365		6.251
%cumulative	14.902		16.262		28.842		32.230		38.147		54.415		67.321		73.025

As it can be seen in Table 3, the items and factors of the research are categorized into eight factors and 41 items. Confirmatory factor analysis in AMOS24 software was used to confirm the final model. The findings related to fitting indices (Chi-square/df (χ^2/df), Goodness of fit index (GFI), Adjusted Goodness of Fit Index (AGFI), Normed fit index (NFI), comparative fit index (CFI), Parsimony comparative fit index (PCFI), and Root mean square error of approximation (RMSEA)), were all optimal and approved the model with five dimensions for the hospital holding

governance. Table 3 demonstrates the fitting indices of the model.

Figure 1 and Table 4; represent the active aging management model with eight factors. The dimensions of policy making, organizational structure, control, financing, governance grants, services, members component, and selected area to focus consisted of four, four, five, four three, three, eight, and 10 items, respectively.

TABLE3- FITTING OF MODEL ON ACTIVE AGING MANAGEMENT

	STATUS OF INDEX	ESTIMATED VALUE	OPTIMAL VALUE	STATISTICS
	√	4.163	Between 2 and 5	χ^2/df
	√	0.028	<0.08	RMSEA
	√	0.906	0.9>	GFI
	√	0.915	0.9>	AGFI
	√	0.927	0.9>	CFI
	√	0.945	0.9>	NFI
	√	0.661	0.6>	PCFI

In this model, there was a significant direct relationship between all factors and active aging management. Also, the highest and lowest standard coefficients were

attributed to financing and decision rights, with factor loadings of 0.83 and 0.44, respectively.

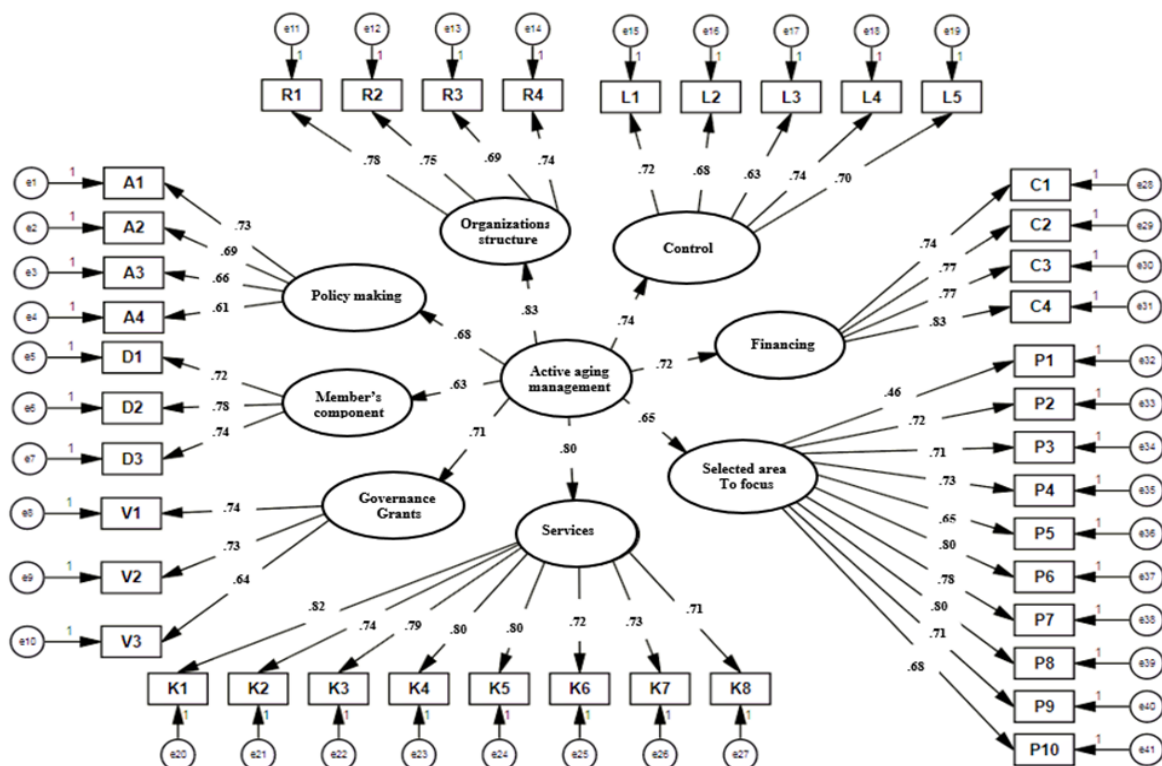
TABLE 4- FACTORS AND SUB-FACTORS OF ACTIVE AGING MANAGEMENT

STATUS	STANDARD COEFFICIENT	SUB- FACTORS	ITEMS	STANDARD COEFFICIENT	FACTORS
√	0.73	Formation of the High Council on Aging	A1	0.684	Policy making
√	0.69	Ministry of Health and Medical Education	A2		
√	0.66	Ministry of Cooperatives, Labor and Social Welfare	A3		
√	0.61	Ministry of Education	A4		
√	0.72	National Strategic Plan of the Elderly	L1	0.742	control
√	0.68	Developing an Active Aging Law	L2		

√	0.63	Developing Active Aging Regulations (Proposed at Ministries Level)	L3		
√	0.74	National Strategic Plan of the health and welfare of the Elderly	L4		
√	0.70	Develop national policies and operational plans based on valid needs assessment	L5		
√	0.78	Decentralized Organizational Structure: Establishing Secretariat of the National Council on Aging at the Capital Level and Establishing General Offices in Welfare Offices in the Provinces	R1	0.832	Organizational structure
√	750/	Council consisting of Ministries of Health and Medical Education and Ministries of Cooperatives, Labor and Social Welfare	R2		
√	0.69	Forming a council consisting of relevant ministries at the state level and delegating to municipalities at the local level	R3		
√	0.74	Formation of the National Council of State and formation of secretariats at the level of deputy governor	R4		
√	0.72	The current composition of the Iranian National Council on Aging,	D1	0.633	members component
√	0.78	The formation of an aging council chaired by the first vice president and all members of the cabinet	D2		
√	0.74	Forming a policy council chaired by the Minister of Health, Health and Medical Education plus the Ministers of Co-operation, Labor and Social Welfare and the Ministers of Education	D3		
√	0.74	Allocate sufficient funds to the Ministries of Health and Medical Education and Cooperatives, Labor and Social Welfare the Ministries of	C1	0.715	financing
√	0.77	Financing from municipalities	C2		
√	0.88	Allocate Social Security Resources plus Pension Funds	C3		
√	0.83	Creating a special insurance plan with the participation of citizens over 40years old	C4		
√	0.74	Subsidies for people over 60	V1	0.707	governance grants
√	0.73	Payment of insurance and tax quotas from the state budget to social security	V2		
√	0.64	Paying elderly health insurance	V3		
√	0.82	Non-participation pension payment to the elderly	K1	0.800	services

√	0.74	Discount Cards for Transportation	K2		
√	0.79	Discount cards for recreational and sports centers	K3		
√	0.80	Perform free health check-ups and outpatient services	K4		
√	0.80	Establishment of hospitals and clinics for the elderly	K5		
√	0.72	Providing long-term care insurance to the elderly	K6		
√	0.73	Creating mobile care services	K7		
√	0.71	Creating a college education plan	K8		
√	0.46	Lifelong Learning	P1		
√	0.72	"Health literacy	P2		
√	0.71	Housing	P3		
√	0.73	Urbanization and Adaptation of Spaces	P4		
√	0.65	Leisure planning	P5		
√	0.80	Nutrition	P6		
√	0.78	mental health	P7		
√	0.80	Employment	P8		
√	0.71	Income security	P9		
√	0.68	Community attitude	P10		

FIGURE 1: MODEL OF ACTIVE AGING MANAGEMENT FOR IRAN



DISCUSSION

This study provides a framework for identifying the factors affecting the management of active ageing. The results showed that the model of the active ageing management had eight factors, including policy making, organizational structure, members component, control, financing, governance grants, services, and selected area to focus. The organizational structure, with a factor loading of 0.83, was the most important factor affecting active aging management, followed by services with a factor loading of 0.80. The factors of control, financing, governance grants, policy making, selected area to focus, and members component with factor loadings of 0.74, 0.71, 0.70, 0.68, 0.65 and 0.63 were in the third, fourth, fifth, sixth, seventh, and eight places, respectively.

The finding of the study indicated the importance of policy making on active ageing management. In a study conducted by Haghshenas [22], evaluation in policymaking in the field of senior management as the main perspectives of the relevant institutions has been emphasized and in the present study the above factor is also mentioned. In this regard, from Ahmadi Teimorloo's [20] point of view, at present, the issue of stewardship is neglected in the health of the elderly and is not one of the priorities of the country which is in line with this study. The government, as the country's executive and policymaker, by forming and attending the High Commission on Ageing, has an important role to play in active ageing management.

The finding of the study showed the importance of control on active ageing management. Ahmadi Teimorloo's [20] study adopted national laws and regulations to control elderly health issues which included 11 policies that did not pay much attention to the necessary dimensions and components of the policy content, which give credence to the results of the present study. According to Zeinalhajju et al. [4] organizing elderly affairs have no legal support and the creation of laws and regulations are proposed for the protection of the elderly by related organization. Also, according to the Riahi's [6] study, a review of the laws and regulations on aging is needed to improve their economic and social position. It is not enough just to adopt laws and policies, but implementation of them is more important, and the government must adopt long-term planning, laws, policies.

In the result of this study establishing coordinated organization to plan and direct activities, related to elderly as a strategic measure to improve elderly support services is necessary, and it is in line with results of the present study. In a study conducted by Palombo [23], collaboration between organizations and the establishment of formal organizations is a key pillar of advocacy for the elderly.

The finding of the study showed the importance of member component on active ageing management. Some studies such as Vogeli and Haghshenas [22,24], in developing countries, there is a need for the involvement of various public and private organizations, but in the present study, non-governmental organizations have not been involved at least in macro policy-making.

The findings of this study indicated the importance of financing on active ageing management.[25]. Ahmadi Teimorloo [20] and Alizadeh et al. [26] proposed insurance policy and service financing. Boyle et al. [27] study, establishing financial stability for the elderly is one of the top priorities of efforts to support the elderly. Jhala and Christian (4)'s study, stated that the financial needs of the elderly must be included in the policies and plans for the elderly. Therefore, sufficient financial support with no concern about daily expenses and future medical expenses is a prerequisite for a good old age. Based on the results of study, government grants on active ageing management is very important. [29] Studies by Jacobs et al. [30] have emphasized the need for preventive measures by government for the whole population (including the elderly) that could lead to a decline in chronic disease. They have proposed the implementation of essential measures in the area of provision of insurance services and free treatment of the elderly by the responsible authorities. One of the executive policies of the government to fund the elderly is the use of targeted subsidies, which is mentioned in the national elderly document.

The finding of the study indicated the importance of providing services on active ageing management. Considering Mohammadi et al.'s [29] research, the formulation of formal and informal policies by the government to establish welfare structures and health-based services for the elderly can lead to the improvement of family quality.

So we can say older people's health plans should focus on meeting the needs of the elderly with a balanced approach which are consistent with the present study. According to previous studies, measures for the elderly in Iran are not adequate and appropriate, and not taking into account the priorities and needs based on the experiences of advanced countries in the near future will lead the country to economic, social and health crisis. The findings of the present study showed alignment with those of Jaleh and Christian [28], who believe that ageing policies and programs should focus on health protection, the labor market, employment, lifelong education, and social support.

CONCLUSION

The results of this study showed those factors, including policy making, organizational structure, members' component, control, financing, governance grants, services, and selected area to focus had an influence on the active ageing management. Therefore, based on the proposed research model, the first step should be to form a High Council of Ageing with the presence of the President's representative and to set policy, plans, and policy priorities in accordance with surveys and need assessment of the elderly. Then, in the second step, the specific funding for the elderly, purely as the elderly (not as retired, needy, disabled, rural or...) as well as the duties of the government and related organizations at each specified level should be determined with responsibility and the scope of their activity and should be precisely defined to ensure implementing decisions. In the final step, which is the implementation phase, with the help of government agencies and other relevant agencies, the elderly are exposed to a variety of services and supports in various individual, economic, and social areas. The results of the present study can be used in countries that are economically, socially, and culturally similar to Iranian conditions and in other countries, due to the impact of these variables, must be done based on the specific need assessment of the communities.

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CONFLICT OF INTEREST STATEMENT

The authors confirm that this article content has no conflict of interest.

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IMPROVEMENT OF SAFETY IN OPERATING THEATRES BY TRAINING AND TEAMWORK

Carina Y.H Lam¹, Tommy K.C Ng¹, Hilary H.L Yee¹

¹. School of Professional Education and Executive Development, The Hong Kong Polytechnic University

Correspondence: lamyanho.carina@gmail.com

ABSTRACT

Medical incidents in public hospitals in Hong Kong have persisted for years. The operating theatres are one of the places where medical accidents occur, especially affecting service quality. The surgical team is a substantial cause of medical incidents, possibly because of human mistakes, environmental, equipment, and system failures. Not all surgery departments will implement uniform working styles. The Hospital Authority may set a management plan to unify practice and to identify the problems faced. Therefore, the government and Hospital Authority should focus on human resources, especially in terms of professional training and retention of staff. After all, surgery is a task of teamwork.

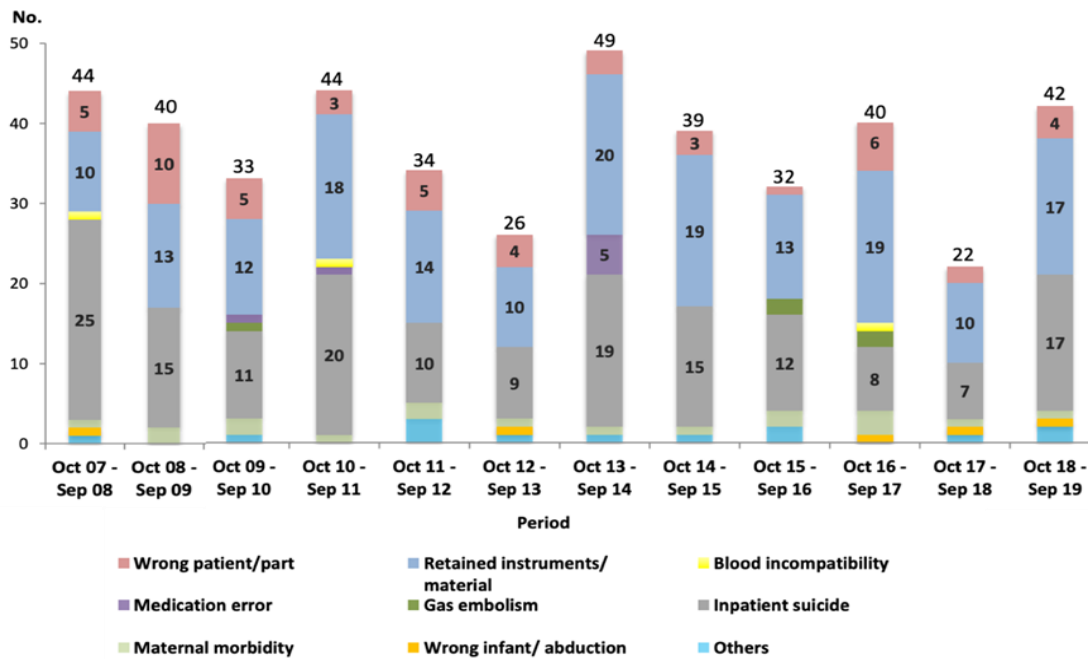
KEYWORDS

operating theatres, quality improvement, public hospital, medical incidents, surgical safety checklist, retain healthcare staff, teamwork

INTRODUCTION

Approximately 200,000 operations were performed in the operating theatres of Hong Kong public hospitals from 2018 to 2019. [1] The Hospital Authority (HA) had started to promote the "Surgical Safety Policy" in 2009 and acted according to the World Health Organization (WHO) framework of "Safe Surgery Saves Life". Medical incidents, arising from the operating theatres in surgery and interventional procedures have involved the wrong patient or body part, retained instruments or other materials, which accounted for almost half of the sentinel events (Figure 1). [2, 3] This article will review the quality improvement of operating theatres in Hong Kong public hospitals.

FIGURE 1. YEARLY DISTRIBUTION OF SENTINEL EVENTS BY CATEGORY (FROM 2007 TO 2016) [3, 4]



SURGICAL SAFETY CHECKLIST

The “Surgical Safety Checklist” was launched in 2008 and has become an essential part of the surgical practice. Its goal is to ensure the safety of surgical procedures and reduce the mortality rate by adopting better communication culture and teamwork. The checklist is divided into three phases, including before induction of anaesthesia, before skin incision and before the patient leaves operating theatre [5]. Each phase is a separate part during the general flow of work. The surgical team must complete the checklist at each of the critical timings before and during the surgery as well as before leaving the operating theatre. The checklist is intended to facilitate the surgical team to confirm important and essential information regarding the right patient and surgical site. The nurses and anaesthetists must thoroughly confirm the identity of patients, the marked surgical site, and known allergies before induction of anaesthesia. Furthermore, to avoid the incidents of critical events, all surgeons should anticipate such and similar occurrences, like possible and approximate blood loss, and plan for the emergency response or non-routine steps. [6]

Although the checklist has been implemented internationally, its effectiveness in the reduction of mortality rates has been questioned as some studies have found mixed outcomes from its implementation. For example, the implementation of checklist in Scotland through the

Scottish Patient Safety Programme has found a substantial decrease of mortality rates in patients undergoing surgical intervention, while hospitals in South Carolina which completed a collaborative, unit-based implementation protocol successfully have achieved a 22% reduction in mortality rates. [7, 8] The implementation of the Checklist in 101 hospitals in Ontario, Canada was not associated with significant reductions in surgical complications or mortality rate during three months of adoption. [9]

CURRENT SITUATION IN HONG KONG

REPORT OF SENTINEL EVENTS AND SERIOUS UNTOWARD EVENTS

In Hong Kong, the Sentinel Event (SE) Policy was implemented in 2007 and the report of Serious Untoward Event (SUE) was incorporated in 2010. [3] The reports of SE and SUE in hospitals aim to identify and review the underlying causes of incidents, and to make recommendations for improvement on patient safety. There are nine categories in SE, including retained instruments, inpatient suicide, wrong patient or body part, and so on. While SUE includes medication error and patient misidentification leading to death.

There were 403 SE incidents reported from October 2007 to September 2018 and the number had decreased from 40 to 22 from October 2016 to September 2018 (Figure 1). [3]

Throughout the years, the category of retained instruments or material, inpatient suicide and wrong patient or part accounted for the most frequent reported SE, which are about 88% of all SE incidents from 2007 to 2019. Among the top three categories, retained instruments or material has remained the most reported category since 2007 and this contributed to higher sentinel events in operating rooms compared to other departments in public hospitals.

Medication errors and surgical procedures of medical incidents are the most concerns as they may result in serious and permanent loss of patient's body functions and even death. Although the number of SE has reduced and maintained less than 50 cases each year after the implementation of SE policy, it has not indicated a continuous drop of incidents throughout the years. The healthcare environment is considered to be very complicated and thus difficult to achieve zero medical incidents. Nonetheless, the effectiveness of existing mechanisms and the management of medical incidents still have room for improvements.

HUMAN RESOURCES

There were 14,651 doctors and 56,723 nurses in Hong Kong up to the end of 2018. [10] The ratio of doctor and nurse to the population is around 1: 511 and 1: 312. According to the survey conducted by the Department of Health, more doctors worked in private sector than those who worked in HA (Figure 2). [11] As public hospitals provide over 80% of all inpatient beds for the entire Hong Kong population, the supply of less than 50% of active doctors in public sectors does not meet the upsurge in service demand. [12] The ratio of doctors to population in Hong Kong is much less desirable, compared with Japan and Australia. This means that Hong Kong physicians need to take care of more patients (Table 1). The government must have a long-term health care manpower planning to recruit more healthcare staff, especially doctors, to work in public hospitals so that the service quality and surgical safety can be assured. It was suggested to have an average of 3.4 doctors for every 1,000 people by the Organisation for Economic Cooperation and Development but the current ratio in Hong Kong is only around 1.9. The shortage of doctors creates heavy workload to them and may increase the chance of medical incidents.

FIGURE 2. DISTRIBUTION BY SECTOR FOR HONG KONG DOCTORS IN 2015 [11]

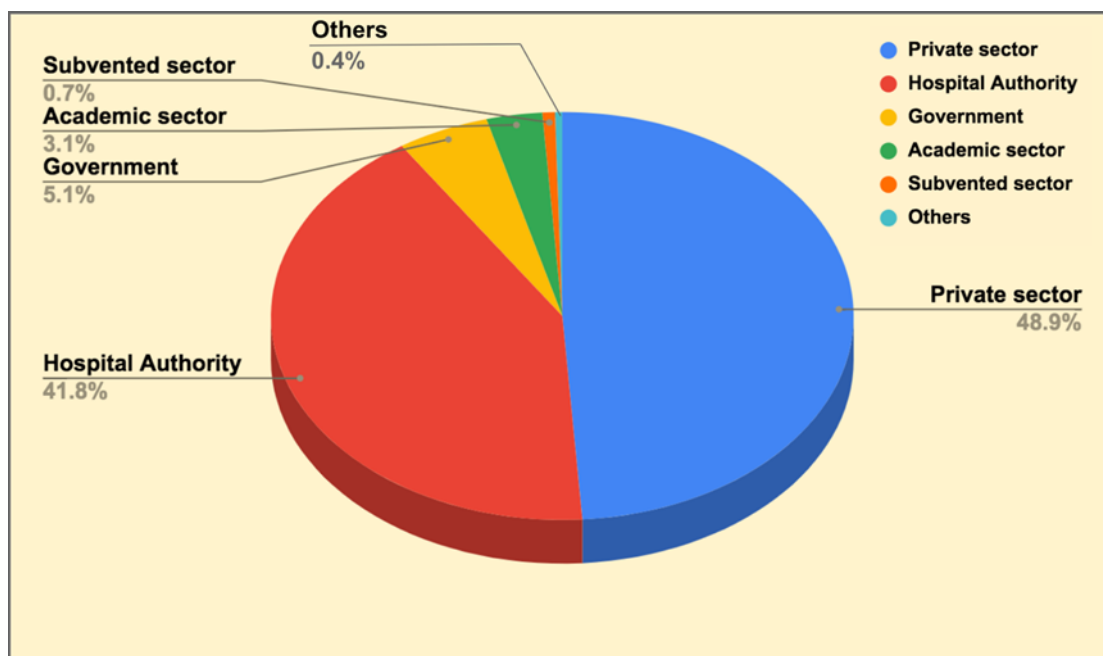


TABLE 1. RATIO OF DOCTORS TO POPULATION IN DIFFERENT COUNTRIES

	HONG KONG [13]	JAPAN [14]	AUSTRALIA [15]
RATIO	1:519	1:416	1:255
YEAR OF REPORT	2017	2016	2015

CAUSES OF MEDICAL INCIDENTS IN OPERATING THEATRES

IMPORTANT PARTS OF SAFETY AND QUALITY IMPROVEMENT IN OPERATING ROOM

Understanding the process flow map of operating theatres can assist in the evaluation of the possible causes of medical incidents in operating theatres. There are five important parts regarding safety and quality improvements in the operating rooms (Figure 3 and 4). [16] The first critical point is to standardise surgery scheduling which can lead to a reduction of scheduling errors. The second point is to improve surgical materials management. Poor materials

management may lead to out of stock or expired inventory if there are non-scheduled order materials. Thirdly, it should include a verification of pre-operative preparation, just in case some of the surgeons may advance the pre-operative workup variably and the staff must confirm the follow up procedure. After that, the verification of the patient's preoperative antibiotics, consent, site marking is very important. Such errors are the causes of the medical incidents in operating theatres, such as the wrong surgical site. The last part is the co-operation between the surgeon and the anaesthesiologist, and this is essential to the surgery. For example, if the surgeon does not arrive at the operating theatre on time, it will result in unnecessary time under anaesthesia and delay of surgical procedure. [16]

FIGURE 3. PROCESS MAP OF PRESURGICAL PLANNING, BEFORE PATIENT ARRIVAL

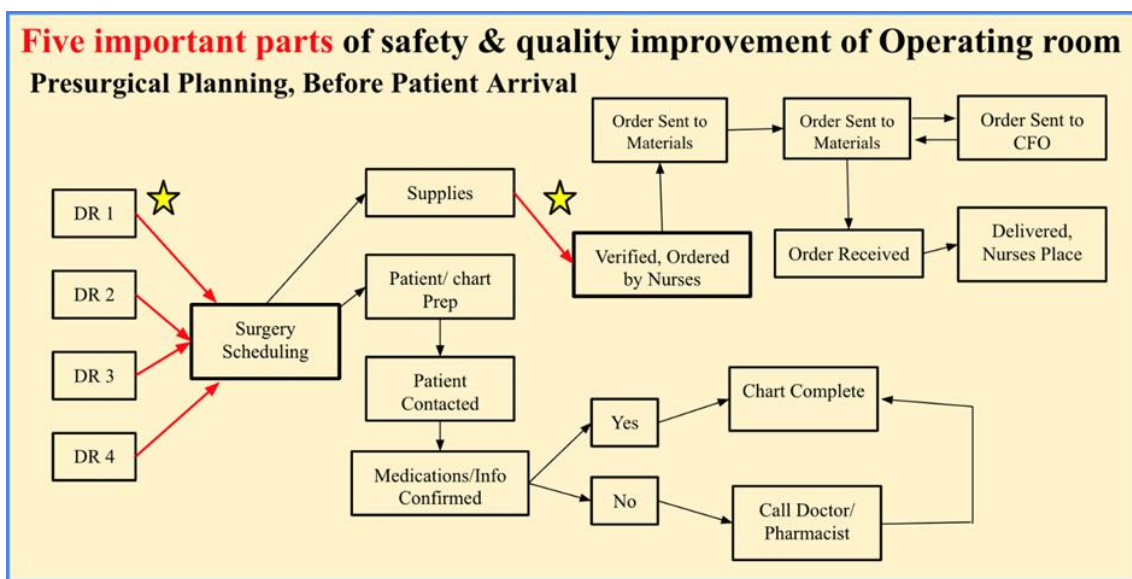


FIGURE 4. PROCESS MAP OF DAY OF SURGERY

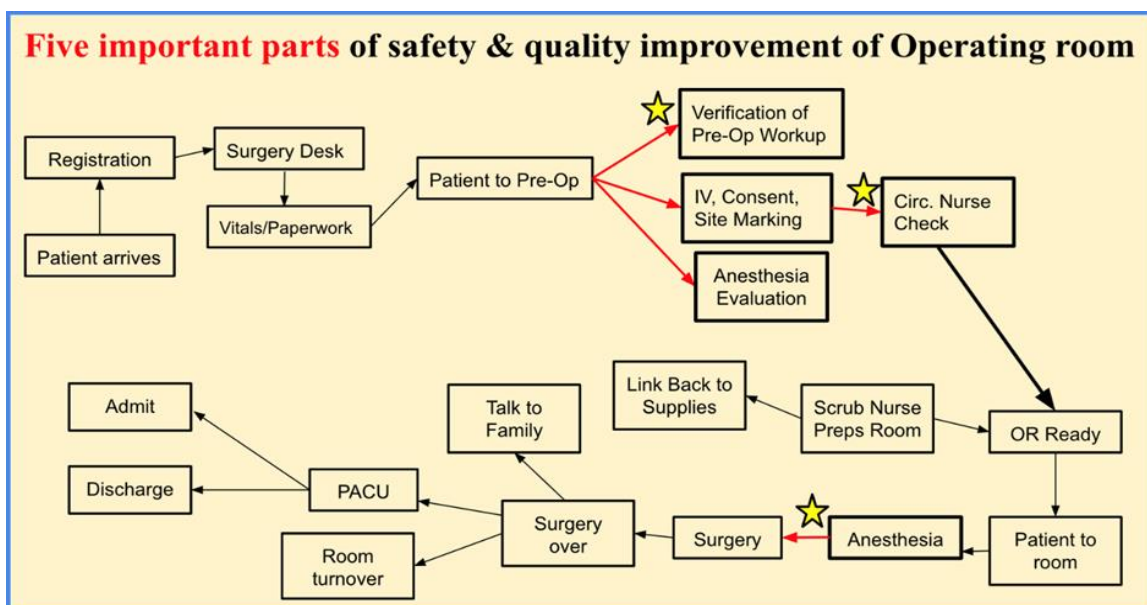
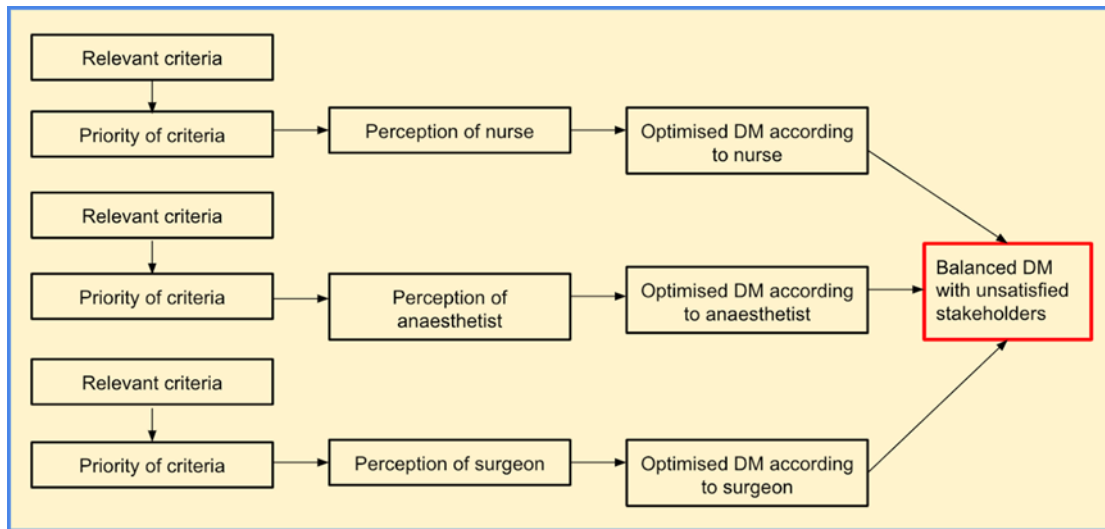


FIGURE 5. THE CAUSES OF PROBLEMS IN THE DECISION-MAKING OF SCHEDULING UNPLANNED [20]



FACTORS OF MEDICAL INCIDENTS IN OPERATING THEATRES

There are several factors which may cause intra-operative stress to negatively influence the judgment, decision making, and communication of surgeons. [17] Human, environmental, equipment, and system component failures are the four main elements affecting the quality of the surgical procedures in the operating room. First, safe surgery is important and medical incidents are highly related to human errors since the surgeon's performance will directly affect the surgical process. Therefore, the knowledge and personal factors of the surgeon become the crucial determinant for the safety and quality of surgery. The complexity of the procedure, dealing with unstable patient and unprepared equipment frequently occur that causes surgeons to work under high pressure. [18] Poor equipment quality and noisy environmental disturbance may affect the process of surgery. For example, the surgeons need to properly follow a series of steps in the tranquil area and they also need to use the appropriate equipment during the procedure. Likewise, the anaesthesia team and the nursing staff should cooperate appropriately with the surgeon because all staff involved in an operation are interdependent and they should avoid making communication mistakes during surgery. [19]

DECISION MAKING IN TEAMWORK

Unplanned surgery sometimes occurs due to emergencies, such as car accidents. There are two main factors that

influence the decision-making of unplanned surgery, including the shortage of human resources and materials and the lack of capacity in operating theatres. [20] Medical staff may bring unstructured decision-making in the operating theatres. Inter-professional and interpersonal dynamics among surgeons, anaesthetists, and nurses are essential during unplanned surgery. All parties have different concerns on efficient schedule of the unplanned surgery arising from their interests and this affects their decision making (Figure 5). The surgeons have the interest to schedule patients that suit their own agenda. For the anaesthetists, working hours are based on an hourly basis, and so their interest is in efficient scheduling. For the nurses, they have fixed hours of shift duties and want to prefer an efficient schedule during the fixed hours. Therefore, a comprehensive schedule plan for the relevant parties concerned can improve decision-making in operating theatres.

RECOMMENDATIONS

ENHANCEMENT OF TRAINING IN SAFETY

Before any operation begins, the nurses of the surgical team must ensure that all essential documents are available and duly completed, including the consent form and identification tags. [21] They should also prepare surgical equipment and materials carefully, review all documents and make sure that the whole surgical team understand the intended procedure and the marking of the operative site. A complete preoperative verification

process can prevent the surgical team from missing details or inconsistencies to avoid unnecessary human errors. Therefore, regular training on the proper procedure of Surgical Safety Checklist and the compliance of conducting the post-procedure checking guidelines should be organised for staff working in the operating theatres. Adequate training could ensure that staff are familiar with the checking technique of the procedures and will increase their awareness of the critical steps of surgical procedures to avoid medical incidents in operating theatres.

IMPROVE COMMUNICATION AND TEAM BUILDING

Communication and a sense of working as a team can provide stronger support to staff, especially the juniors, resulting in fewer mistakes and more resilience which in turn improve the overall safety. [22] Senior staff and consultants can also provide advice and execute better supervision to junior staff and specialty trainees so that they can be more involved in the running of the surgical wards and the process of operations. The junior members will learn how to manage specific situations. In addition, the timely assistance of the anaesthesia team and communication among the surgeons, anaesthetists and nurses can help to avoid mistakes during the operations to ensure patient safety. [23] For example, an electronic screen can be placed in the operating room to record the medical history, complete operation sequence of each patient and facilitate the operating room staff. This may strengthen the communication among team members, and they can understand their tasks more clearly from the update displays on screen and facilitate the efficiency of the operation. Both the National Academy of Medical Sciences and the Joint Commission have suggested that the lack of teamwork is the major cause of inefficiencies and medical errors in the operating rooms. [24] Therefore, surgical excellence demands teamwork. All surgical teammates must offer their greatest professional ability and co-operate with each other to achieve a successful operation.

ADOPTION OF SHORTER SHIFT

Standard working hours can protect workers' rights and adequate rest time is very important for health care staff. Making mistakes in decisions by health care staff is caused by sleep-deprivation. [25] Tiredness and fatigue can contribute to human errors by affecting decision making. A balance of a working schedule and rest time is essential in protecting both healthcare workers and patient safety. With reference to the European Working Hours Regulation

legislation, sufficient rest time for doctors could reduce fatigue and improve their own safety and that of patients. [21] Medical staff working shorter shifts are less likely to make serious medical errors comparing with working frequent shifts of 24 hours. [26] Therefore, HA should consider shorter shift instead of frequent shift with frequent overtime work so as to increase work satisfaction and quality of care.

REAL-TIME OBSERVATION DURING SURGERY

To effectively reduce the surgical incidents in operating theatres, real-time observation by the senior medical staff with a checklist during surgery is useful. [27] The occurrence of adverse events was decreased 30% after the adoption of real-time observation due to the senior who can oversee the surgical activity. Therefore, the completion of Surgical Safety Checklist can be enhanced for reduction of surgical incidents. Furthermore, senior medical staff acting as observer can utilise Observational Teamwork Assessment for Surgery for assessing the communication, leadership, cooperation, coordination and team monitoring among surgeons, nurses and anaesthetists. [28] Observer can rate on the above five behaviours for understanding the room for improvement in the operating theatres. The assessment is crucial to identify the issues in the operating theatres to optimise the surgical procedure. Follow up discussion with the surgical staff on the identified problems during surgery can be conducted.

CONCLUSION

The ideal quality of the operating theatres is principally due to the professional surgical team and proper operating environment. Heavy workload can lead to professional surgical teams working in stressful mentality causing higher chance of medical incidents. Therefore, the government and Hospital Authority must aim to improve the quality of the operating theatres in terms of professional training and retention of staff. Effective quality improvement in the operating room is expected to minimise the medical error.

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HOME HYGIENE AND PREVENTION OF INFECTIONS

Zoe F. Y. LAI¹, Sukhpreet KAUR¹

1. Hong Kong College of Community Health Practitioners

Correspondence: Joanne.Morris@canberra.edu.au

ABSTRACT

Health is wealth - a famous proverb that almost everyone has heard of but may not have fully understood its essence. Health comes from maintaining cleanliness and hygiene which starts from home and expands to workplaces and public areas. By practicing hygiene in the home and everyday life settings, it will have impact significantly in reducing the global burden of infectious diseases that kills over 17 million people a year. Mainly caused by microorganisms, infections can easily spread by direct and indirect contact. Common infectious diseases include chickenpox, common cold, malaria and pertussis. These diseases tend to have specific symptoms such as fever, diarrhoea, fatigue and muscle aches. In institutional settings, such as schools and child-cares settings, information relating hand hygiene is routine. However, the home environment is one of the potential sources of transmission of infectious diseases. This situation, of course, needs to be re-evaluated and the promotion of home hygiene should be encouraged. Positive correlation has been found between home hygiene practices and risk of disease transmission in homes where the first line of defence against infectious diseases is cleaning and disinfecting plus maintaining good hand hygiene. But, the implementation for an effective policy to monitor home hygiene is rather complex due to varying determinants of health. In a nutshell, proper home hygiene and cleaning practices lead to reduced risk of spreading infectious diseases. They should form the key issues in the practice of health promotion in the community and institutions.

KEYWORDS

home hygiene, infection prevention, cleanliness, community health

INTRODUCTION

Health is wealth - a famous proverb that almost everyone has heard of but may not have fully understood its essence. Health comes from maintaining cleanliness and hygiene which starts from home and expands to workplaces and public areas. [1] Understanding that health correlates with happiness, enjoyment and pleasure can help change the perception of good health and its importance. This paper focuses on home hygiene with the aim to provide an insight on some of the hygiene practices in the home and everyday life settings, to pinpoint common symptoms and possible health problems as well as to discuss the likelihood of establishing an effective policy for home hygiene.

DEFINING HOME HYGIENE

Home is where we live and sleep. Hence it is our responsibility to make it a clean and hygienic household for the sake of all house members. [2] Surprisingly, one in four of the public still believe that hygiene in the home is not important. [3] Another survey has found that 23 percent of the 2,000 participants claimed that hygiene is not important at home as children should be exposed to harmful germs to build up their natural immune system. [4] It is noted that infection and cross-infection often occur in the home. [5] Home hygiene is basically about identifying

the critical hygiene points and taking precautions to stop the spread of harmful germs. [6]

IMPORTANCE AND IMPLICATIONS OF HOME HYGIENE

The number of people at higher risk of infection, or have an infectious disease, is increasing. [5] There are links in the chain of infection which allow an infection to pass from one source to another thus has become a global crisis that kills over 17 million people a year, according to the World Health Organisation. These links include source of germs, way out for germs, spread of germs, way in for germs and persons at risk.

The chain can be broken if at least one link is removed to remove the spread of germs and take infection control. [1] This can be done by keeping an infected person isolated, by taking caution with raw food, diapers and soiled items, [6] and preventing coughs and sneezes getting onto surfaces or hands. It is also crucial to make sure the food is properly cooked, and water is clean to drink and be extra careful about cleanliness with food for people at more risk. Infections can be passed directly from one person to another or indirectly through surfaces, equipment and unwashed hands.

HYGIENE ISSUES

INFECTIOUS DISEASES

Infections are mainly caused by microorganisms and can spread easily, both with direct and indirect contact. [7] Humans are surrounded with millions of microbes, be it at homes or workplaces. They cause the spread of infections and make people sick. [8] Some of the common infectious diseases include chickenpox, common cold, malaria, meningitis, pneumonia, tuberculosis and pertussis. [8] These diseases tend to have specific symptoms such as fever, diarrhoea, fatigue and muscle aches. [9] While most can be treated by antibiotics, it is always advisable to consult a doctor should the symptoms get worse or last longer than a few days. It is equally important to understand that heavy reliance on antibiotics may reduce their efficacy. Good hygiene means fewer infections and hence reduced demand for antibiotics. This will limit the consumption of antibiotics in the community and save the need for development of new generations of potent antibiotics.

HOME HYGIENE PRACTICES

The Australian Department of Health has suggested some house cleaning materials and equipment, including cleaning products for floors, bathroom, laundry tubs, kitchen sinks, meal areas, detergent for kitchen items and household linen, and disinfectant. [10] Allocating household cleaning duties to a timetable can help maintain good home hygiene. For instance, cleaning kitchen benches or tables several times a day after food preparation and dish washing is a good practice. The floors should be swept, and trash should be emptied once a day. Tasks like washing floors, cleaning toilets, laundry tubs, dusting surfaces and washing clothes should be done once or twice a week. Other tasks such as cleaning the refrigerator, oven, cupboards and windows can be done once each month.

GENERAL HOUSEHOLD, HAND AND FOOD HYGIENE

Home hygiene is interconnected with general household, hand and food hygiene. General household hygiene, in this context, refers to maintenance of hygiene of the surroundings, the environment such as surfaces commonly touched by hands to be disinfected regularly. [6] In household waste disposal, all wastes should be placed in a suitable container with a close-fitting lid, or tightly fitting lids for bins placed in the open areas. Cleaning the household should be adopted by all family members as a routine task.

Hand hygiene is the most important way of preventing infection. [11] The skin is the first-line barrier to infections, and hence should be kept as clean and healthy as possible. [12] Hands should be washed correctly before food preparation, before eating, immediately after handling raw food, after using the toilet, after contact with contaminated areas, after contact with blood or body fluids, and whenever the hands are dirty. [6] The correct way to wash hands is to apply soap, rub hands together for at least 20 seconds, paying attention to fingertips, thumbs, between the fingers and the wrists, rinse well and dry thoroughly. [13] Another way to keep hands clean is to use hand sanitizers that contain alcohol as the antibacterial ingredient. [6] They help to kill a spectrum of microbes but are not meant to substitute for handwashing especially if the hands are visibly soiled.

In recent years, institutional settings such as schools, child-care and adult-care centres have seen reduced transmission of germs since the distribution of information

relating to hand hygiene. [14] This activity has been introduced in institutional settings because home environments are like these places. The study has found that less students were absent due to illness, a reduction in respiratory illness amongst the adults and infections in children. [15]

In the current outbreak of the novel coronavirus, named Covid-19, the World Health Organisation has declared a pandemic based on the growing infected cases around the world. [16] As of 5 April 2020, there are 1,133,681 confirmed cases and over 11,000 deaths across 209 countries. [17] To arouse public awareness, the World Health Organisation and local health authorities around the globe provide basic and specific protective measures to fight against the outbreak, including cleaning hands regularly and thoroughly, avoiding physical contacts such as handshakes, keeping a social distance and putting on facial masks, etc. Maintaining personal hygiene helps to deter the spread of virus.

Food hygiene is equally important. Any food can contain germs, [6] thus must be cooked thoroughly at a high temperature. If not, there is a high chance of bacterial growth to an unsafe level in the food. People who prepare food need to follow good and strict hygiene practices to ensure the prepared food is safe for consumption. Therefore, one must not prepare any food when suffering from infections. There are key actions to prevent food poisoning: containing, cooking and chilling. [18] Containing prevents cross-contamination when raw food is kept separately from cooked food, and food preparation surfaces is hygienically cleaned. Cooking instructions on packaging must be checked and followed as they guide users on the right storage temperature and timing. Thoroughly cooked food will reduce the germ contents to a safe level. Lastly, chilling stops bacteria growth inside or on the outside of food when it is stored appropriately. Cooked food should be cooled as quickly as possible to prevent regrowth of germs. Expired food must be discarded. In addition, it should be a routine to clean internal surfaces and the door handle of the refrigerators regularly.

PRACTICES AND STANDARDS

USING TARGETED HYGIENE TO BREAK THE CHAIN OF INFECTIONS

Targeted hygiene helps promote infection prevention

through home hygiene. [19] It identifies sites and situations of high risk for "transmission of pathogens" in the home and reduces the exposure to such sources, [11] in contrast to the misconception that constant sanitization of homes can contribute to the development of antibiotic resistant microbes as well as disrupt one's immune system. [20]

Children should be taught in schools about targeted hygiene [3] to embed best practice from an early age and encourage a hygienic lifestyle while noting that being exposed to good bacteria does no harm to our immune system, it is essential to ensure that everyone washes hands before eating and after using the toilet.

HYGIENIC CLEANING

Hygienic cleaning removes dirt and gets rid of as many germs as possible, either by removing or disinfecting them [4] that needs to be done at the right time. Germs can be removed by cleaning with hot water and detergent and then rinsing to remove the germs whereas disinfection is achieved by killing germs using heat or products. After hygienic cleaning, surfaces should be dried which can be by air drying, hanging to dry or by using clean towels or cloths on surfaces.

PRACTICES IN DEVELOPED ECONOMIES

Australians were once labelled, in a newspaper article, as some of the most unhygienic people in the world in a study of 12 developed countries by the Hygiene Council. [21] The study further highlighted the correlation between infectious diseases and personal hygiene and stressed the need to improve in the area of personal hygiene. This, of course, is not the case anymore. From 1 November 2019, Hand Hygiene Australia (HHA) offers hygiene programmes to educate health care workers and the public of hand hygiene. [22] The programmes are developed particularly for specialised settings and clinical activities where practical step-by-step guidance is provided to support the implementation of the programmes and to encourage hand hygiene culture.

Singapore, the cleanest city in Asia, has spent the last 50 years convincing the public to maintain hygiene and cleanliness by launching the Keep Singapore Clean campaign. [23] This campaign, in contrast to previous campaigns, imposes fines as a method of social control to achieve success. Singapore does not have a distinctive policy for home hygiene but has definitely succeeded in

changing the mindset of its people. In the recent outbreak of COVID-19, the government has introduced standards that will help with current and future outbreaks as well as allow everyone to carry on with daily life. [24] The seven standards include washing hands frequently, monitoring body temperature, using tissues when sneezing or coughing, throwing away used masks and tissues, returning food trays and keeping tables clean, keeping surroundings clean and well-ventilated, and keeping toilets clean. Singapore's cleaning regime has enabled it to achieve the position as the cleanest and greenest city in South Asia.

CAMPAIGNS IN HONG KONG

Hong Kong does not have a proper policy for home hygiene, but it runs campaigns time and again as measures to encourage it. In 2019, the Food and Environmental Hygiene Department together with other government departments organized an Anti-rodent Campaign under the theme Prevent Disease Eliminate Rodent Nuisance implemented in two phases between 7 January 2019 and 13 September 2019. [25] The rodent problematic spots identified were attended to and participation of the public in rodent prevention and control work in their premises was promoted.

Separately, the Department has established guidelines on cockroach prevention and control in domestic premises. [26] Cockroaches are the most common pests in the homes. The guidelines suggest the public to keep the premises, especially kitchens, dry and clean, to store food properly, and to put all refuse and food remnants into a bin which must be emptied at least daily. It is also suggested to inspect at least quarterly the bottom and back of furniture as well as concealed places such as air ducts and wire ducts, and seal any cracks at ceilings, on walls and floors. Sealing all openings on external walls, floors and roofs through pipes and wires left by installation of split-type air conditioners and installing wire mesh of 2mm at drain holes will help to prevent entry of cockroaches.

PUBLIC POLICY ON HOME HYGIENE

The World Health Organisation defines hygiene "as the concept of cleaning and any practice aimed at maintaining health and preventing the spread of diseases". [27] It is achieved through cleanliness, and can be practiced at personal, domestic, industrial, institutional and community levels. It is not the case in some developing countries where a large number of people lack proper

information on hygiene. The lives of many people, especially children and the vulnerable populations, are put at risk without good hygiene, and Preventable hygiene-related diseases have been found to be one of the leading causes of death. In 2016, these diseases were responsible for 829,000 annual deaths from diarrhoea, making it a prime contributor to ill health and mortality. [28] If drinking-water, sanitation and hygiene are monitored, almost 10 percent of the total burden of disease can be reduced worldwide. However, the implementation for an effective policy to monitor home hygiene is rather complex due to varying determinants of health. [29]. Some challenges they bring to nations when implementing hygiene include poverty, lack of government support, lack of community participation, lack of information on hygiene practices and culture and behavioural issues. [27] Poverty is typical in developing countries, where families would give priority to clothes and food. In such areas, hand washing facilities are usually temporary, non-existent or made from local materials that are not durable.

Governments often fail to take initiatives to enhance hygiene practices due to either the lack of planning, inadequate resources or lack of community involvement. [27] For example, the Malawi government adopted a Hand Washing with Soap Campaign from 2011 to 2012 but no follow up or continuing efforts were made after its expiration. [27] There were no funds put aside to continue the hand washing activities plus little interest was shown by the public. If the people do not realize the importance of such measures, it fails its purpose and becomes totally ineffective. Culture also plays a major role as people intend to resist new hygiene facilities and ideas due to different beliefs on hygiene. In several rural areas, it is a common practice of washing hands in the same bowl of water by family members. Such inconsistencies discourage the continuing push and campaigns for hygienic activities.

To implement a policy for home hygiene, the households must understand the concept of basic hygiene. [30] In developing places, the government needs to uplift the lives of people from poverty so that they can prioritize hygiene, and should come forward to achieving hygiene improvements because high political engagement is crucial. [25] Ethiopia and India have experienced political commitment by the officials who have led to improved hygiene. [31] The government and its departments can further commission a thorough review of policy, allocate funds on hygiene programmes and promotion, and create necessary legislation to advance this move. Once the

government is seen fully committed to this initiative, it will only be a matter of time for the public to fully participate and support the government. The engagement of the community can have a profound impact in improving and developing new ideas in the areas of safety, clean air and hygiene [29] that will ensure the acceptability and sustainability of hygiene projects.

CONCLUSION

Health comes from maintaining cleanliness and hygiene, and it starts from home. Home hygiene is identifying the critical hygiene points and taking precautions in order to stop the spread of harmful germs. If not, it could lead to infectious diseases that kill over 17 million people a year. Home hygiene is interrelated to hand, general and food hygiene that can be achieved using targeted hygiene and hygienic cleaning. By practicing hygiene, it can result in reduction in disease transmission and improved health. The government should take initiatives to enhance hygiene practices as well as the community should support such measures for long term benefits.

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THE ROLE AND RESPONSIBILITY OF CLINICAL PHARMACISTS IN RHEUMATOLOGY CLINIC: AN EXPLORATORY STUDY IN HONG KONG.

Shirley Wai Ying YIP¹, Gary Chung Hong CHONG¹

1. United Christian Hospital, Hospital Authority, Hong Kong

Correspondence: ywy510@ha.org.hk

ABSTRACT

In Hong Kong, arthritis is the third leading chronic disorder among the older people. It could create a huge amount of burden on the health care system if patients cannot achieve good diseases control and have recurrent flare up of diseases. To maintain stable control and minimize acute flare up, medication adherence is essential. Studies revealed that drug education has the highest evidence in improving medication adherence. Pharmacists who are expert in drugs can provide counseling to arthritis patients, improving their drug adherence and disease activities. As a result, research evaluating the effectiveness of pharmacist counseling service on improving arthritis patients' medication adherence and disease activities in Hong Kong has been initiated in a specialist out-patient clinic of a local acute hospital.

This research aims to improve patient medication adherence and enhance medication safety. A validated Compliance Questionnaire on Rheumatology (CQR-19) is used to measure the medication adherence. From the preliminary data, over 90% of the recruited subjects are non-adherence at baseline and thus, detailed drug counseling is necessary.

During the first visit, pharmacists will provide a 20 minutes drug counseling service to the referred patients. This includes discussion on drug administration schedule, importance of drug adherence, side effects management and pain management. Besides, pharmacists also have different roles in other aspects such as drug information and

procurement. Pharmacists would assist in providing evidence-based information and recommendations to physicians and nurses for drug-related enquiries. These attempts to improve therapeutic outcomes and minimize medication errors, enhance medication safety and reduce hospitalization. Design of the multidisciplinary care model and results of this study would provide a reference for the future development of clinical pharmacist service in rheumatology.

KEYWORDS

clinical pharmacist, rheumatology, arthritis, medication adherence, medication safety, DMARDs

INTRODUCTION

In Hong Kong, arthritis is a highly prevalent condition among older people and can cause joint deformation and long-term disability, leading to reduced quality of life. According to a study conducted by Census & Statistics Department on older persons aged over 60 years old in domestic households, arthritis is the third leading chronic disorder among them with prevalence of 19.9% in an estimated 795 800 elderly with chronic disease population. [1] According to the National Institutes of Health (NIH) of the United States, arthritis is a disease condition instead of a single disease. It refers to joint inflammation which usually leads to joint pain, swelling of joints and stiffness of joints. [2]

There are different types of arthritis such as rheumatoid arthritis (RA), ankylosing spondylitis (AS) and psoriatic arthritis (PsA). These arthritis diseases are also the comorbidities of other rheumatic diseases such as myositis. From the data of a hospital based cross-sectional retrospective study, the estimated average total costs for management of a type of arthritis, RA, in Hong Kong during 2006-2007, were already \$9286 US dollar per patient year. [3] Due to the high prevalence rate of arthritis in elderly, it could be expected that huge amount of burden would be created on the Hong Kong health care system if patients' diseases are not under good control.

Satisfactory medication adherence is essential in achieving good disease control. According to several studies in RA patients, higher medication adherence is statistically significant associated with lower flare rate and disease activity score (DAS-28). [4, 5] Effective disease control at an early stage can also prevent irreversible joint damage and hence improve patients' quality of life. [4] Study data also supported that drug counseling and education has the highest evidence in improving medication adherence. [6] Pharmacists who are the experts in drugs are capable of providing counseling to arthritis patients, improving their drug adherence and disease activities. Therefore, research evaluating the effectiveness of pharmacist counseling service on improving arthritis patient's medication adherence and disease activities in Hong Kong is initiated in a specialist out-patient clinic of United Christian hospital.

In this paper, the role and responsibility of clinical pharmacists in rheumatology clinic of Hong Kong will be discussed from various aspects: 1) multidisciplinary care model in rheumatology clinic 2) role in patient counseling and collaboration with other health care professionals, and 3) Benefits of clinical pharmacists in rheumatology clinic.

MULTIDISCIPLINARY CARE IN RHEUMATOLOGY CLINIC

Clinical pharmacist services have been well established in many specialties such as oncology, pediatric and geriatric to promote medication adherence and enhance medication safety. Studies have illustrated that clinical pharmacists significantly reduce medication errors and improve patients' medication adherence through drug education. [7-10] Clinical pharmacists also have close collaboration with other health care professionals such as physicians and nurses, providing evidence-based

recommendation to optimize drug regimens and treatment outcomes. [8, 9, 11] Therefore, it is worthwhile to conduct this research to evaluate the effectiveness of clinical pharmacist counseling service in rheumatology.

In a few countries, pilot pharmacist-led rheumatologic clinics has been set up for patient counseling although the study data is limited.

In Canada, an observational study comparing patient satisfaction between the pharmacist physician collaborative care model and traditional physician provided care in rheumatology clinic occurred in 2015. [12] Pharmacists provided patient education and shared decision making on treatment regimens.

From the study results, patients showed statistically significant higher mean overall satisfaction score in the pharmacist physician collaborative care model (collaborative care: 4.56; physician: 4.30; P=0.02). [12] Patients also showed higher general satisfaction (collaborative: 4.61; physician: 4.25; P=0.005) and satisfaction in information provided (collaborative: 4.53; physician: 4.20; P=0.007) in the collaborative care model. [12] In addition, the results also verified that the clinic capacity was increased by 50% in the collaborative care model [12] and therefore more patients could be seen by the rheumatologists in each session. This reduces the waiting time of new cases.

Another 6-month study was undertaken in Singapore in 2010 which measured patient satisfaction of a pharmacist/advanced practice nurse (APN)-led rheumatology monitoring clinic. [13] In the study, patients were reviewed by rheumatologist and pharmacist/APN at alternative intervals. There were four pharmacists and two APN involved in the service. [13] In this monitoring clinic, the pharmacist/APN would review the effectiveness of the treatment and monitor for adverse drug reactions. If the patients were stable, a repeated prescription would be issued to them. If drug-related problems or disease flare was detected, patients would be referred to a rheumatologist immediately. [13] Over 90% of the patients were satisfied with the monitoring clinic as they could understand the disease better. The patients were also more likely to adhere to the treatment. [13] On the other hand, over 80% of rheumatologists agreed that this service saved their time which allowed them to focus on complex cases and improve overall patient care. [13]

These study results demonstrated that clinical pharmacists service in rheumatology can enhance patient care and patients' disease knowledge, leading to improvement in medication adherence. It can also allow more time for rheumatologist to assess patients. However, there is a lack of studies focused on measuring improvement in patient medication adherence and disease activity after receiving pharmacist counseling in rheumatology.

This research attempts to evaluate the effectiveness of pharmacist counseling service on improving arthritis patient's medication adherence and disease activities in Hong Kong. Since rheumatology includes a large variety of diseases, this research only focuses on arthritis patients, mainly rheumatoid arthritis (RA), ankylosing spondylitis (AS) and psoriatic arthritis (PsA) patients.

The aims of this research are to 1) improve patient medication adherence 2) identify drug-related problems or adverse drug reactions 3) enhance medication safety and, 4) improve patient disease activity.

A multidisciplinary care model including physicians, nurses and pharmacists have been designed. Physicians and rheumatology nurses will refer new arthritis patients, patients with complex regimens and patients with non-adherence issues to this study. Referred patients who are on at least one oral disease-modifying antirheumatic drugs (DMARDs) or steroid will be recruited. Upon completion of the first pharmacist counseling visit, a phone follow-up at week 6 and a face-to-face follow-up visit at week 12 will be arranged for the recruited subjects.

During the initiation assessment, baseline medication adherence of the recruited subjects will be measured with the Compliance Questionnaire on Rheumatology (CQR-19). This questionnaire is validated in rheumatology for measuring patient medication adherence. [14] The total score ranges from 0-100 and a higher score indicates a higher level of medication adherence. According to the validation studies, patients with CQR-19 score greater than 80 are indicated as adherence while those less than or equal to 80 are indicated as non-adherence. [14] The mean score and the number of adherence patients before and after pharmacist counseling will be compared in the study.

The improvement in disease activity of recruited subjects and its association with the improvement in medication adherence are the secondary outcomes. The disease

activity of RA, PsA and most other arthritis patients will be measured by disease activity score (DAS-28) while that for AS patients will be measured by Bath Ankylosing Spondylitis Disease Activity Index (BASDAI).

From the data collected till 1/2020, the medication adherence of the recruited subjects is not desirable. Over 90% of the recruited subjects are non-adherence with baseline CQR-19 score not more than 80. Since the administration schedule of some DMARDs are not at daily basis such as methotrexate (MTX) is usually prescribed as once weekly dosing, patients would miss the doses easily especially during initiation of new treatment regimens. During phone follow up discussion with patients, adverse drug reaction or drug-related problems are identified in one third of the recruited subjects. These preliminary data justified that detailed drug education and counseling is necessary for improving medication adherence in arthritis patients.

ROLE OF CLINICAL PHARMACISTS IN RHEUMATOLOGY CLINIC

Pharmacists are well-educated in drug therapies and thus competent to provide drug counseling to arthritis patients. Besides patient education, pharmacists also have distinctive roles in other aspects such as dispensing and drug procurement. These will be discussed below.

PATIENT EDUCATION

Patient education includes discussion on drug administration schedule, importance of drug adherence, side effects management and pain management. Pharmacists will provide a 20 minutes drug counseling service to the referred patients during the first visit. According to World Health Organization (WHO), medication adherence refers to the extent to which a person's behavior corresponds with agreed recommendations from a health-care provider which means taking the right medications at the right time, dosage, and frequency. [15] Therefore, educating patients on correct drug regimens are vital. Since DMARDs and prednisolone used for disease control of arthritis usually require escalating and tapering regimen respectively, drug calendars specified the date of dose increment or reduction will be prepared and explained in detail to patients. Chinese drug name labels of DMARDs will be provided to facilitate the communication with patients. In addition, pharmacists will discuss the drug-drug and drug-food interactions with patients and provide

recommendation on the management. For example, cyclosporine A (CsA) which is frequently used for treatment of PsA will interact with grapefruit juice, leading to an increase in plasma concentration of CsA and hence increasing the risk of toxicity. Therefore, pharmacists are to remind those patients that they have to avoid grapefruit juice all the time. Besides, use of Chinese herbal medicine such as Lingzhi and Ginseng are very popular in Hong Kong and Asian countries. However, these herbal medicines usually stimulate the immune system. Since arthritis are autoimmune disorder that joints are attacked by patients own immune system, these herbal medicines may worsen their disease control. Furthermore, concomitant use of DMARDs and herbal medicines could easily lead to derangement of liver function test. Hepatotoxicity is a side effect of many DMARDs such as MTX and Leflunomide while herbal medicines are commonly metabolized by liver enzymes. As a result, this increases the risk of DMARDs induced hepatotoxicity and may interrupt the treatment schedule, worsening the disease control of patients. Therefore, pharmacists will evaluate the use of Chinese herbal medicine and supplements in arthritis patients and provide individualized recommendation on the management during the counseling.

Besides education on drug regimens, disease knowledge education and understanding patients' belief towards the treatment are crucial in improving adherence. According to WHO reports, there are many factors affecting patient medication adherence. The immediacy of beneficial effects is one of them while DMARDs usually need to take 1-2 months to achieve their effects. [15] Consequently, pharmacists will discuss their slow onset of action and confer the long-term consequence for uncontrolled diseases such as irreversible joint erosion and deformation to patients. Hence, this would encourage patients to adhere to the treatment and have good disease control at an earlier stage, thus preventing further joint damage and reduction in self-care ability.

Experience of side effects is another factor leading to drug non-adherence issue. [15] During counseling, pharmacists will explain the side effects of DMARDs and warning labels will be provided to remind patients. Advise on self-monitoring and management skills for mild side effects will be provided to relieve patient's concerns. For example, gastrointestinal tract discomfort is one of the common side effects for hydroxychloroquine (HCQ), pharmacists would recommend patients to administer it with food to minimize the side effects. Phone follow-up is also arranged for each

patient to closely monitor for and detect any possible adverse drug reactions or acute flare up of disease. If they are detected during phone follow up, recommendation on self-management will be provided and may refer to rheumatologists if necessary.

Last but not least, pharmacists will discuss both pharmacological and non-pharmacological methods for pain management. Safe use of non-steroidal anti-inflammatory drugs (NSAIDs) and low dose steroid will be reviewed and discussed with patients as physicians usually allow patients to titrate these drugs according to their needs. Moreover, pharmacists will educate patients to use non-pharmacological methods such as warm and cold compress in different situations for pain relief.

Through the patient counseling, we hope to improve drug adherence of patients and enhance medication safety.

VERIFICATION AND DISPENSING

Before patients can receive their medication, their prescriptions will be screened and verified by pharmacists to prevent prescribing errors such as incorrect frequency or duration. Besides, patient's on-hand medication prescribed by other specialties will be reviewed to avoid drug interaction and duplication especially for NSAIDs. If drug-drug interaction is identified, pharmacists will provide recommendation to physicians and work out the solution with them. Afterwards, drugs will be dispensed to patients.

DRUG INFORMATION AND PROCUREMENT

Besides dispensing and patient education, clinical pharmacists would collaborate with other health care professionals including physicians and nurses to optimize patient care and treatment plans. Pharmacists would assist in providing drug information and the preparation of education materials. For example, drug sample books displayed most of the available DMARDs, NSAIDs and steroids with different strengths were prepared to facilitate the communication between physicians and patients during consultation. On the other hand, pharmacists also help in providing evidence-based information and advice to physicians and nurses for drug-related enquiries. Pharmacists are familiar with different drug search databases for solving different types of drug-related problems. They also trained for selecting and analyzing data from clinical studies and databases critically in order to formulate the most appropriate approach. Hence, they can provide recommendations with evidence support efficiently.

In addition, procurement is fundamental to maintain stable drug supply and introduction of new drugs. When there is interruption or discontinuation of existing drugs, clinical pharmacists could immediately deliver this information to physicians and provide alternatives. When there are new treatment options available, pharmacists would help in the application process and prepare supporting data on efficacy and safety of new drugs. Hence, it can smooth the introduction of new drugs in the hospital and hence patients could have more treatment choices especially for refractory cases.

THE BENEFITS OF CLINICAL PHARMACISTS IN RHEUMATOLOGY CLINIC

Clinical pharmacists pose positive impacts on several areas in rheumatology including patients' treatment outcome, medication safety and medical expenditure.

Through pharmacist drug counseling, the tapering or escalating drug schedule can be clearly explained to patients, minimizing the risk of wrong dosage or frequency. Although dispensing labels with administration instruction are affixed on each prescribed drug, medication errors could still exist by cause of misinterpretation of drug information on the labels. [16] For example, initiation of MTX treatment often requires escalating schedule and the dose is increased every 1-2 weeks. Before the pharmacist counseling service, considerable number of patients could not follow the schedule. They may wrongly administer MTX every day but it should be taken once weekly, leading to overdose and toxicity. Some patients could not step up MTX to targeted dosage due to misunderstanding, leading to sub-therapeutic effects and insufficient control of the disease. After pharmacist counseling service, these situations are improved and more than 90% of the recruited patients can follow the treatment schedule.

Besides, possible drug-drug or drug-food interaction will be discussed with patients. This prevents suboptimal therapeutic effects due to reduction in drug concentration or overdose related to interaction. These can improve treatment outcome and enhance medication safety.

Moreover, pharmacists would educate patients on side effects management, preventing patients' non-adherence issue related to side effects. For examples, during initiation of treatment or switching drugs, some patients would be concerned about the side effects and

do not administer the drugs as prescribed. Besides, when patients experienced side effects, most of them will stop the drugs by themselves until next follow up. After drug counseling, patients would understand the management of mild side effects and if any adverse drug reactions were detected during phone follow up, pharmacist could provide appropriate recommendation such as reducing the drugs to tolerable dosage and giving advice on pain management. This could prevent severe acute flare up of diseases due to side effects related non-adherence issue and hence improve treatment outcomes.

According to a study on RA patients in Hong Kong, more than 20% patients required accident and emergency (A&E) visit and hospitalization due to flare of RA. [3] Some of them required hospitalization for more than one time and the mean duration of inpatient care was 5.5 days. [3] Furthermore, several studies demonstrated that pharmacist counseling reduced medication errors and hospitalization, showing net benefits in cost-saving of the medical system. [17-18] Through pharmacists counseling in rheumatology, it could improve drug adherence and disease control and enhance medication safety, reducing acute flare rate and hospitalization. Thus, it reduces the burden on and saves the medical expenditure of the public health care system.

CONCLUSION

Clinical Pharmacists in a rheumatology clinic have distinctive roles in different aspects including patient counseling, dispensing, handling drug information and procurement. They provide drug counseling to improve drug adherence and enhance medication safety. Hence, this multidisciplinary collaboration care could improve the treatment outcome and disease control of patients, further reducing acute flare up of diseases and hospitalization.

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QUALITY MANAGEMENT OF INPATIENT MEDICATION ADMINISTRATION IN HONG KONG PUBLIC HOSPITALS

Catherine K. Y. Kwong¹, Ben Y. F. Fong¹

1. School of Professional Education and Executive Development, The Hong Kong Polytechnic University

Correspondence: kwongkiuyan@gmail.com

ABSTRACT

Medicine maladministration can result in various side effects to patients, including serious complications, extended medical care, incapacity and death. In Hong Kong public hospitals, the pattern of medication error consists of prescribing error usually made by physicians, dispensing error resulting from pharmacists and dispensers, drug administration error caused by nurses and patient-care workers and technology-related error associated with technology used in the drug administration process. Medication Administration Record (MAR) and ward stock are the usual inpatient medication system within the Hospital Authority public hospitals before the development of the electronic system, while the Inpatient Medication Order Entry (IPMOE) functions to provide real-time accessibility in patients' medication profiles by different professions and health units. However, several factors are related with medication errors. For instance, the ambiguous handwriting orders in the MAR prescribed by physicians affect the transcription by pharmacists and the administration procedures in ward by nurses. Administering medicines in ward stock before pharmacists vetting increase the chance of making errors. Poor interface issues between users and system, and the computer over-reliance also contributed to technology-related errors. In order to reduce the occurrence of medication incidents, implementation of Automated Pharmacy Distribution Systems helps moving towards a closed loop medication management system. Modifying technologies in barcode assisted medication administration and enhancing the IPMOE with a pop-up message could help intercepting drug administration errors to patients. The elimination of the

potential risks arising from the prescribing, dispensing and drug administration processes brings the achievement of medication safety in Hong Kong public hospitals.

KEYWORDS

quality management, medication error, inpatient drug administration, public hospitals

INTRODUCTION

Medication maladministration to patients can lead to serious adverse drug events, prolonged hospitalisation, extra medical treatment, morbidity and death as well.[1] In public hospitals, the medication system should be efficient and effective to ensure the accuracy of prescribing and dispensing medicines to the right patients. Unsafe dispensing practices and medication errors are undesirable clinical practice. There are potentially preventable factors to achieve the medication safety goal.[2] In order to reduce the occurrence of medication errors inside the hospitals, it is essential to find out the frequently undetected errors and the associated factors causing the problems in the whole medication management process. The elimination of the potential risks arising from the prescribing, dispensing and administration procedures of drugs is the concrete action to minimize the hazards to the patients. This paper aims to review the current practice of inpatient medication administration in Hong Kong public hospitals, to examine factors leading to medication incidents and to

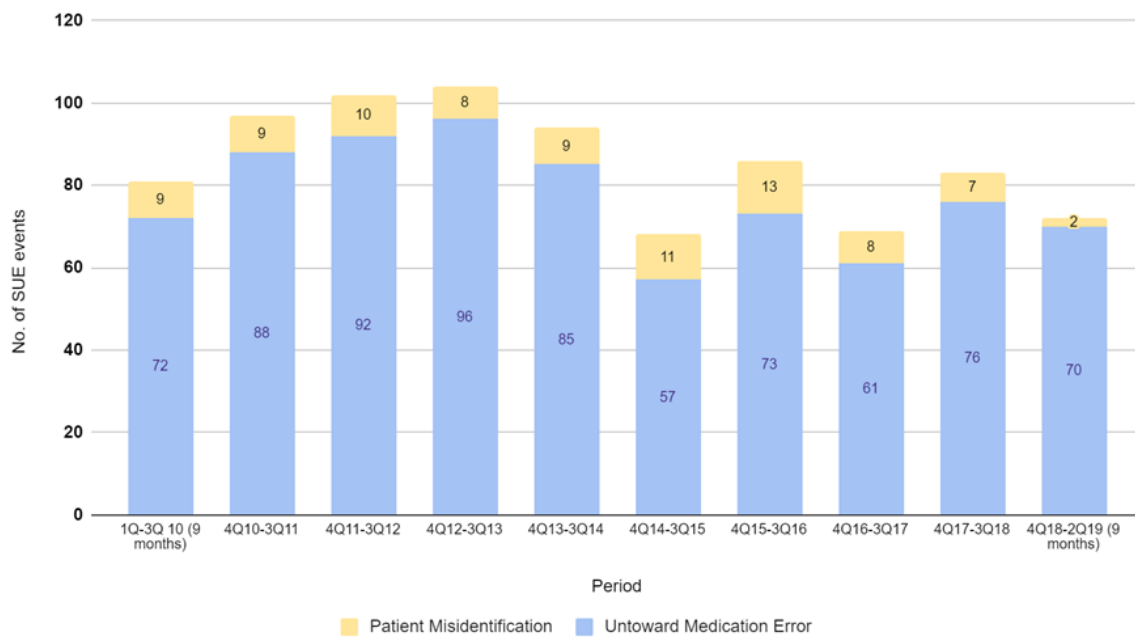
propose operational strategies to improve inpatient medication administration.

STATISTICS IN HONG KONG

The Serious Untoward Event (SUE) Policy has been implemented in Hong Kong public hospitals since 2010 in co-operation with the Sentinel Event (SE) Policy starting in 2007.[3] SUE includes untoward medication errors and patient misidentification that can lead to death or

permanent harm. According to the annual report of the Hospital Authority (HA), 72 SUE were reported from the fourth quarter in 2018 to the second quarter in 2019 (Fig. 1).[3] The proportion of medication error was much greater than patient misidentification. The three most common issues in untoward medication errors came from prescriptions of known drug allergies, dangerous drugs and anticoagulants.[3] It showed that the errors in prescribing procedures should be mostly focused and solved with some effective interventions.

FIGURE 1: YEARLY DISTRIBUTION OF SUE BY CATEGORY [3]



CLASSIFICATION OF ERRORS IN MEDICATION INCIDENTS

Medication errors may arise from both human or system failures.[4] The pattern of medication errors in Hong Kong public hospitals consists of 53.4% prescribing error, 29.0% drug administration error, and 17.6% dispensing error.[1] The 'Swiss Cheese Model' is used to explain the interception of human errors.[5] In the healthcare system, doctors, pharmacists and nurses are considered as defensive layers in the medication use process corresponding at the prescribing, drug dispensing and drug administration stages respectively. The study indicates that the prescribing errors and dispensing errors could be partially intercepted by hospital pharmacists and nurses, while majority of patient-reached administration errors are unnoticed or not

intercepted.[1] There are also technology-related errors in the system usage.

PRESCRIBING ERRORS

These errors are made by doctors.[6] The errors may occur as a result in a prescribing writing process or a medication ordering decision. They include incorrect choice of drugs, incorrect dosage, wrong route and frequency of administration, incorrect administration instructions of a drug product, drug allergies, undesirable drug-drug interactions. However, in the inpatient system of the HA public hospitals, some prescribing errors are likely to reach the patient undetected, including wrong instructions, drug omission, double entry, wrong duration, known drug allergy and wrong patients.[1]

DRUG ADMINISTRATION ERRORS

The most frequently non-intercepted errors are drug administration errors made by nurses and patient-care workers. Usually such errors happen when there is deviation from the physician's orders.[6] The safety of the medication administration process is affected due to dose omission, extra dose, wrong drug administration, wrong patient, wrong strength of drug, wrong time, wrong flow rate of intravenous fluid and drug allergy.[1]

DISPENSING ERRORS

The process of dispensing from dispensers is integrated with patient counselling from pharmacists. It is important to maintain good quality in the sequence of steps to produce best practice and outcomes for the patients. Dispensing errors are made by pharmacists and dispensers when distributing medications to outpatients or inpatients.[6] The most frequent errors include wrong dilution volume in drug preparation, incorrect labelling and directions, and drug dispensed to the wrong patient.[1]

TECHNOLOGY-RELATED ERRORS

These errors are associated with a technology used in the drug administration process.[7] They are divided into the two categories of socio-technical errors and device errors. A socio-technical error is an unintended and unexpected

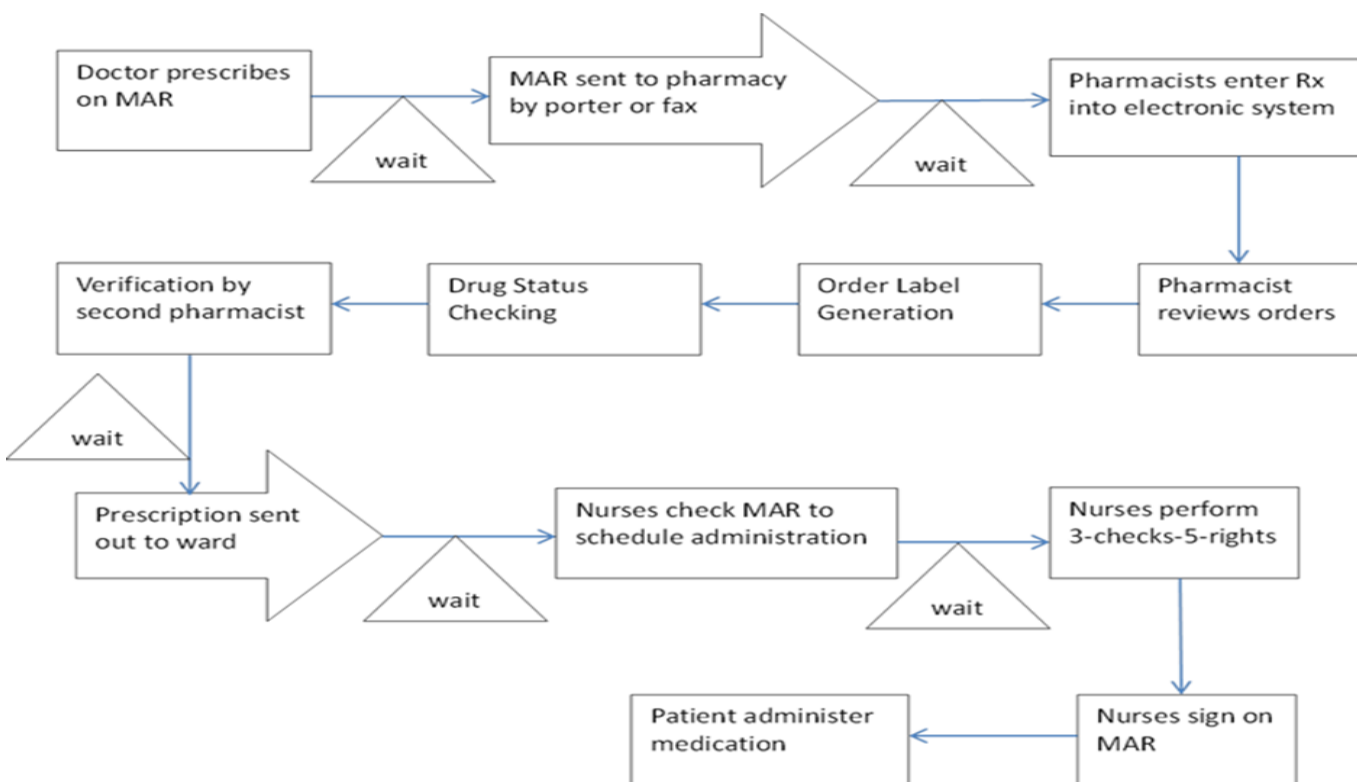
result due to a human and technology interaction. The unintended errors are produced by health care providers, like selecting a wrong drug name from the electronically prescribing system. A technical failure of the device is not related to human action, for example, an unanticipated device error occurs when a defected infusion pump is used resulting in a wrong dose of parenteral infusion being given.

DRUG DISTRIBUTION SYSTEMS IN PUBLIC HOSPITALS

INPATIENT DRUG PRESCRIBING SYSTEM - MANUAL SYSTEM

Before the full development of the electronic system, the general process of handling inpatient medication is the Medication Administration Record (MAR).[8] Inpatient prescribing by doctors is hand-written on the MAR form. Pharmacists need to transcribe the handwriting on MAR to the electronic system in pharmacy. Medications for inpatients are then prepared and distributed in a central pharmacy. For patient-specific unit doses, those drugs would be sent to the wards daily. The medications are transported from the pharmacy to the wards for administration by nurses as described in (Fig. 2).

FIGURE 2: FLOWCHART OF INPATIENT MEDICATION ADMINISTRATION PROCESS (MAR)



Source: [8] Chiang SC. In-Patient Medication Order Entry System - contribution of pharmacy informatics [Internet]. 2015 [cited 2019 Nov 5]. Available from <http://www3.ha.org.hk/haconvention/hac2015/proceedings/downloads/S12.1.pdf>

INPATIENT DRUG ADMINISTRATION SYSTEM - WARD STOCK

Apart from manual MAR, nurses need to manage the drugs stored in the wards. An advanced technical system, Barcoded Ward Stock Topping Up System, is used to extend the pharmacy functions in the wards at Ruttonjee Hospital, a district general hospital.[9] All drugs stored in cabinets and ward fridges are barcoded and kept in the ward according to the pre-agreed ward stock list and quantities. With the help of barcode device, pharmacy staff can capture and replenish items before the minimum level is reached without nurse requisition. It can better control the ward stock and storage conditions, compared with traditional ward stock procedures.

INPATIENT DRUG ADMINISTRATION SYSTEM - INDIVIDUAL PATIENT DISPENSING

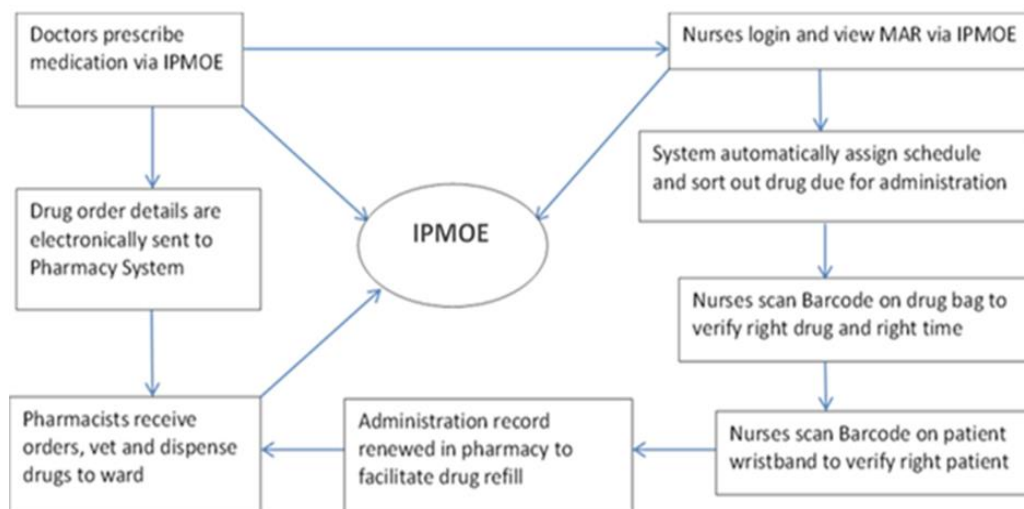
Individual Patient Dispensing system in wards is used concurrently when a course of therapy is dispensed according to the manual prescription for each patient. A specific medication profile could be maintained after reviewing the appropriateness of the therapy by pharmacist. An individual drug supply for several days of therapy is sent to wards and it helps to limit the time intervals for dispensing. Computerized Automatic Refill System is an electronic system to save the previous dispensed drug in record and repeat the therapy when necessary. Nurses are required to inform pharmacy if there is a change in patients' complete drug profile. This auto-refilled from pharmacy could bring a better control of work schedule, as well as an increase in the amount of returned drug when the drug therapy has changes.

INPATIENT MEDICATION ORDER ENTRY (IPMOE)

The Hospital Authority has been using an electronic medication system, Inpatient Medication Order Entry (IPMOE), to replace the hand-written order form since 2010. IPMOE is a modernized module which is gradually implemented in 15 acute hospitals across all the 7 clusters.[3] It is an internally built IT system with a closed loop for in-patient drug management. This integration system allows frontline healthcare professionals to login the IPMOE via different channels, like desktop computers, computers on wheel, or mobile devices such as iPads and tablets. The mobile apparatus improves the efficiency of administration process and minimizes prescription and administration errors, thus improving both patient safety and users' experience.

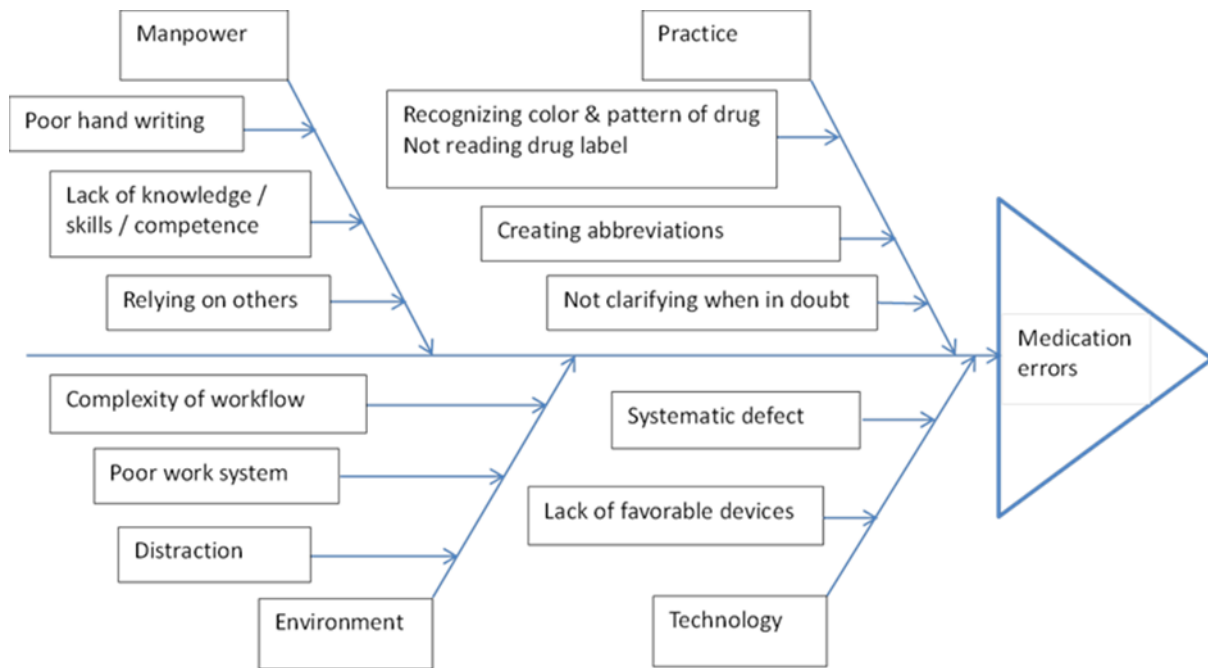
The module provides real-time accessibility to patients' medication profiles, without paper prescriptions. Medical practitioners can prescribe electronically via IPMOE without using manual records and thus avoiding errors resulting from poor handwriting. Pharmacists can check and vet prescriptions in IPMOE and dispense through the desktop computers equipped with HA secured intranet, supported with barcode scanners, printers and label printers. Nurses are able to receive and read the patient's record at the point of care by using mobile terminals in in-patient areas (Fig. 3).[10] The system helps in streamlining workflow, improvement of efficiency, integration of Medication Decision Support knowledge, standardization of medication ordering line, reduction of medication errors, enhancing communication between caregivers and improving medication documentat

FIGURE 3: FLOWCHART OF INPATIENT MEDICATION ADMINISTRATION PROCESS (IPMOE)



Source: [10] Leung CB. Implementation Journey of Inpatient Medication Order Entry Project in Prince of Wales Hospital [Internet]. 2015 [cited 2019 Nov 5]. Available from <https://www3.ha.org.hk/haconvention/hac2015/proceedings/downloads/S12.4.pdf>

FIGURE 4: CAUSE-AND-EFFECT DIAGRAM OF MEDICATION



Source: [15] Hou N, Tang H. Analysis of Medication Errors in Provincial Hospital. Biomedical Journal of Scientific & Technical Research. 2017; 1(4).

FACTORS ASSOCIATED WITH MEDICATION ERRORS

PROVIDERS

The poor handwriting orders by doctors would definitely affect the transcription by pharmacists and the administration procedures in the ward by nurses, leading to increased risk and frequency of medication incidents. Ambiguous handwriting orders make it difficult for pharmacists to enter the record into the pharmacy system. Such and incomplete orders often consume extra time in returning to the physicians for clarification and would increase the waiting time.

WORKING ENVIRONMENT

Heavy workload in public hospitals is one of the sources of stress for staff, particularly the medical practitioners, pharmacists and nurses. Doctors often work under urgent and critical circumstances, resulting in making errors more frequently.[11] Fatigue from high demand of work may affect the performance of healthcare professionals, leading to the poor recognition and assessment of orders from doctors and pharmacists. In addition, poorly designed working area is also a risk factor. For example, the drugs stored in ward stock should be managed regularly depending on the usage in each ward. However, nurses are required to do a large amount of administrative

paperwork, and so time spent in checking the quantity and quality of medications is reduced. Samaranayake has mentioned that distractions from environment and workflow deficiencies are factors which could cause staff to make mistakes in computer entry, increasing the chance of medication errors.[7]

PRESCRIBING PRACTICE

Abbreviations are commonly used in prescribing practice. The adoption of special codes and terms in prescriptions is a universal method used by doctors in handwritten prescription, by pharmacists and dispensers in transcription and in picking drugs in pharmacy, and by nurses in medication administration. However, there are some unapproved abbreviations in the "Do Not Use" list, because similar abbreviations would cause confusion to those working in other units. The list helps to minimize medication incidents arising from the misuse of unapproved or unconventional abbreviations.[12] For instance, "I.A." is indicating the route of drug administration. This abbreviation may have a misinterpretation between "inter-arterial" and "intra-articular", leading to errors and potential harm.

Verbal orders are sometimes used by doctors during emergency situations, but this is not recommended when orders are not put into the system. Phone instructions could affect the content and context of the verbal orders, arising

from spelling errors in drugs with similar names, using non-standardized abbreviations and terminology, differences in language skills and clarity of communications of the speaker, and even the noise level in the environment as well.[13]

Inappropriate working procedures are the most common cause in mixing up the barcoded patient identification labels.[7] The barcode labels are used to eliminate 'wrong-patient' errors. However, the errors still exist when staff do not follow the proper procedures. It has been found that some nurses may 'violate' the rules or use 'workarounds' to overcome the obstacles associated with using the barcode technology in drug administration.[7] A study in 2017 illustrated that workarounds were used in 66% of medication administrations in hospitals using barcode-assisted technology.[14] When staff encounters unexpected situations or impractical steps, they may find ways to circumvent the correct procedures, increasing the opportunity to making errors. Therefore, simple systems allow flexibility in workplaces for nurses and frontline staff, while setting standards and rules in working procedures helps to ensure the accuracy of dispensing medicine.

COMPUTERIZED INFORMATION SYSTEM

Poor interface between users and the computer system is a common cause for technology-related errors.[7] Knowledge of staff in using a new system and computer over-reliance are also contributing to errors. Out-dated modules with unnecessary data set may create inferior user interfaces. For example, when using infusion pumps, the deficiency of key pad usually generate errors. As a result, nurses would enter doses and flow rates which are not intended.[7] It may lead to extra doses given to patients when a missed decimal dot or an additional zero is entered, and this would increase the risk to patient safety. Introducing a safe system, counter checking by the device operator and verification by another nurse are measures to avoid such errors.

Quality Management in hospitals is important for assessing and improving the quality of healthcare services. A simplified model named '4P Excellence Model' provides a recommended structure to build quality into 4P: people, partnership, process of work and products / service products.[16] This strategy should be multi-directional and be implemented in both top-down and bottom-up approaches. Danish Hospitals have adopted the '4P

Excellence Mode' with 'European Excellence Model' for evaluating and diagnosing the level of excellence in healthcare services. A number of key performance indicators (KPIs) are selected in areas of leadership, people management, partnership and resources, processes and products/ services results.[16]

In Singapore, The National University Hospital has fully adopted the operation of an end-to-end 'closed-loop' electronic system called the Closed Loop Medication Management System (CLMMS) in the inpatient setting. CLMMS is composed of Electronic Inpatient Medication Record, Clinical Decision Support System, Inpatient Pharmacy Automated System and Electronic Medication Administration Record System.[17] The improvement outcome is proved by KPIs, including the following: (1) 80% of medication orders are stocked in cabinet, (2) 91% of medications administered are barcoded, (3) safe picking of medications with reduced errors per 100 days, (4) correct medications administration with prevented errors per 100 patient days, (5) secure medication storage, (6) improved work efficiency, (7) redeployment to patient centric activities, and (8) streamlined the restocking process with real time inventory. It has indicated that the Closed Loop Medication Management System is a successful tool to perform the medication distribution along the inpatient system in terms of achieving the four 'rights' of medication safety, which are the right patient, the right drug, the right dose and the right time.[17]

RECOMMENDATIONS

AUTOMATION

Implementation of Automated Pharmacy Distribution Systems is the key in moving towards closed loop medication management systems.[18] Some procedures in the preparation and distribution of medications can be automated. For example, in-pharmacy robotics can perform the storing and picking of medicines and the labelling stage of the dispensing process. The Automated Tablet Dispensing and Packaging System pack tablets and capsules into barcoded unit doses which facilitate the medication administration in wards.[17] Each unit dose of medicine, for tablet and capsule dosage form, is separately packed with a protective sealed unit. To facilitate the closed loop medication management, these units are barcoded and labelled with the drug name, strength, batch number and expiry date.[18] To monitor the drug inventory, a controlled substances cabinet located in

the pharmacy is a computerized drug storage device to track individuals who access to the cabinet and drug distribution.[18]

CLINICAL PHARMACISTS

Interventions by pharmacists are useful in intercepting errors, and so clinical pharmacy services should be introduced as a strategy in public hospitals.[7] Clinical pharmacists can assist nurses in the pharmaco-therapeutic information during medication administration in wards. Double checking by another colleague helps to prevent prescribing errors during drug administration, without just depending on the surveillance of nurses. Clinical pharmacists may present valuable data on common medication errors, which help in implementing technological innovations to monitor or strengthen the medication safety.[7] They may also educate patients about their drugs, whereby patients could be more knowledgeable regarding their own medication therapies.

TECHNOLOGICAL INNOVATIONS

Modifying technologies in barcode assisted medication administration technology and smart infusion pumps can help intercepting drug administration errors. A closed-loop electronic medication administration system with barcode verifying technology significantly reduces timing and non-timing errors.[19]

Automated Dispensing Cabinets (ADCs) are suggested to store ward stock medications in the wards.[20] It is a computer-controlled system that can interface with external devices. The clinical medication orders could be reviewed by the pharmacist before drug administration by the nurses. ADCs are able to interface with barcode technology to function in the restocking process and tracking dispensed medications automatically. In addition, when it is linked with the point-of-care barcode system, it can help to ensure matching the prescribed drugs and selected drugs electronically, so as to enhance the efficiency of drug dispensing at the bedside and reduce the 'wrong drug' errors.

POP-UP ALERT IN IPMOE SYSTEM

The enhancement in IPMOE with a pop-up message will alert staff during prescribing, dispensing and administration. In the prescribing module, patient's allergy information should be indicated clearly in a pop-up message in a red box when prescribers are entering the patient's medication records.[3] For repeat prescription of "fixed period" and

"single use" medications, nurses should check for the pop-up alert which is displayed on the electronic patient record, and ask doctors or clinical pharmacists for confirmation. For prolonged prescriptions of a certain drug, an alert pop-up screen should be shown to remind the physician to provide the expected prescription duration.

In the drug administration module, it needs a pop-up window to call the attention from nurses in administering the criteria-based medication and the record should be listed in the drug administration record to facilitate further treatment or clinical management.[3] When a drug is not suitable for patient, it should be marked as "Omit" by nurses to present a clear documentation and record. Moreover, improving the IPMOE display according to ward columns is useful for the frontline staff in drug administration, such as changing the remarks to 'Withhold' or 'SelfAdmin' instead of 'Prescription changed' and 'Unscheduled' column.

CONCLUSION

It is imperative to achieve medication safety in hospitals during every process, including prescribing, transcribing, dispensing and administering in order to reduce the medication incidents. Effective strategies to ensure medication safety include implementing clinical pharmacists in wards to work with nurses, utilizing automated system and technical devices in pharmacy enhance the efficiency and accuracy of medication preparing and dispensing. Upgrading the IPMOE alert system is critically important for the working process in drug prescription and administration.

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RETROSPECTIVE EVALUATION ON PATIENT SCREENING AND COUNSELING SERVICE ON DIRECT-ACTING ANTIVIRALS AGAINST HEPATITIS C

Bob Ka Him Wong¹, Gary Chung Hong Chong¹

1. Department of Pharmacy, United Christian Hospital, Hospital Authority, Hong Kong

Correspondence: wkh440@ha.org.hk

ABSTRACT

OBJECTIVE

Drug-drug interactions and risk of hepatitis B reactivation potentially affect treatment outcomes of direct-acting antivirals (DAA) against hepatitis C. A comprehensive pharmacist screening and counseling service was implemented in a Hong Kong hospital, which aims to optimize the efficacy and safety of DAA therapy while minimizing the risk of drug wastage. The objective of the service review is to explore potential roles of pharmacist in hepatitis C management.

DESIGN

We retrospectively evaluate all cases under service from June 2017 to September 2018.

MAIN OUTCOME MEASURES

Outcomes measured include drug-related problems (DRP) identified, treatment discontinuation and failure rates.

RESULTS

There were 44 cases under provision of service, all completed therapy except 1 died from underlying disease. 25 DRPs, predominantly categorized as drug-drug interactions, were documented. The interactions commonly involved acid-lowering agents. 1 case was noted with inadvertently lengthening of treatment duration. No cases of treatment failure or hepatitis B reactivation were reported.

CONCLUSION

The safety concerns and high cost of DAA have created a new challenge to healthcare providers. Comprehensive screening and counseling by pharmacists are valuable to ensure safe and effective use of DAA, hence reducing unnecessary drug wastage.

KEYWORDS

direct-acting antivirals, hepatitis C, pharmacist, medication review, drug wastage

INTRODUCTION

Hepatitis C is a contagious liver disease caused by hepatitis C virus (HCV). Around 75-85% of patients infected by HCV become chronically infected. In Hong Kong, infection rate has been estimated to be less than 0.5% for the general population. [1] If left untreated, 15-30% of chronic cases would develop cirrhosis within 20 years, causing substantial mortality from liver failure and hepatocellular carcinoma (HCC). [2]

The major aim of anti-HCV treatment is to eradicate HCV, which has been shown to prevent liver-related complications including HCC and need for liver transplantation. [3] Conventional interferon-based regimen

leads to sustained virologic response (SVR) in only 40-65% of cases. [4] The unfavorable adverse event profile further compromises treatment outcomes due to early discontinuation of treatment. Since 2011, the ongoing development of direct-acting antivirals (DAA) has achieved >90% SVR with improved tolerability. [5] Nonetheless, the high cost of DAA therapy has limited the access to new treatment worldwide. [6, 7] Concerns for drug-drug interaction and risk of hepatitis B virus (HBV) reactivation may also affect treatment efficacy and safety.

In view of the potential risk and huge cost of DAA therapy, a comprehensive pharmacist screening and counseling service has been implemented in a Hong Kong public hospital since 2017. The service aims to maximize the clinical benefits while minimizing the risk of treatment failure and subsequent drug wastage. The purpose of this study was to explore the potential role of pharmacist in hepatitis C management under the service model.

METHODS

The study retrospectively reviewed all cases under the pharmacy screening and counseling service since June 2017 to September 2018 for evaluation. All patients were included if any of the following DAA was prescribed: sofosbuvir/ledipasvir, ombitasvir/paritaprevir/ritonavir/dasabuvir, sofosbuvir/velpatasvir, asunaprevir/daclatasvir or sofosbuvir, with or without ribavirin. Patients were excluded if the DAA therapy was started outside the hospital.

SERVICE SETTING

The service for clinical screening and counseling for hepatitis C patients on DAA therapy was established under the collaboration of gastrointestinal specialists and pharmacists in United Christian Hospital, a public hospital under Hong Kong Hospital Authority. Within the service framework, all patients first prescribed with DAA were referred to clinical pharmacist for medication review. For each case, clinical pharmacist reviewed the appropriateness of the DAA regimen based on the HCV genotype, prior treatment history, baseline liver and renal function. Particular focus was made on patient's medical

history and medication profile to check for potential drug-drug interaction and other disease precautions, for instance, risk of HBV reactivation. After the regimen verification, clinical pharmacist provided patient counseling on the administration schedule of DAA, possible adverse drug reactions including preventive and self-management measures, as well as the importance of medication adherence. While DAA therapy typically ranges from 8 to 24 weeks, pharmacist dispensed the medications as short refills every 4 to 6 weeks. If any drug-related problems were identified during initial review or subsequent refills, appropriate advice was provided for issues manageable at pharmacy level. Otherwise, the case was referred back to specialist clinic for further work-up by physicians. Throughout the service, the procurement team was informed of each individual's regimen schedule to ensure a subsequent supply of the medication.

DATA COLLECTION

Patient demographics and relevant clinical data, including medical history, medication profile, HCV genotype, HBV serology, SVR at 12 weeks (SVR 12), renal and liver function, were collected from the electronic medical record. Documented drug-related problems (DRPs) and pharmacist intervention were retrieved from pharmacist notes of the service.

OUTCOMES

Primary outcome was the number and type of drug-related problems identified under the service. Secondary outcomes include treatment discontinuation and failure rates.

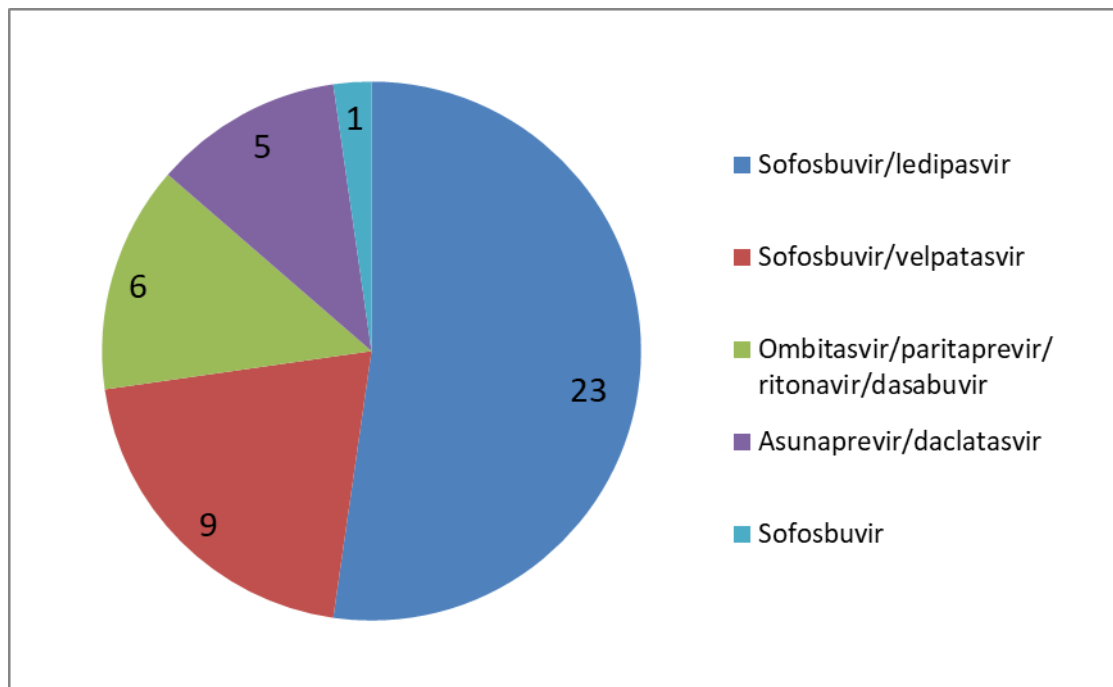
FINDINGS

Within the captioned period, a total of 44 cases were referred to the service. Table 1 illustrated the baseline demographics of the cases. 42 cases completed the DAA therapy uneventfully, and 1 case required regimen modification due to ribavirin intolerance. 1 case deceased from underlying advanced cirrhosis during the DAA therapy

TABLE 1. PATIENT DEMOGRAPHICS (N=44)

CHARACTERISTIC	NUMBER (%)	
MEAN AGE (\pm SD)	61.5 \pm 9.2	
SEX – MALE	28 (63.6)	
CIRRHOSIS	Child Pugh class A	28 (63.6)
	Child Pugh class B	1 (2.3)
	Child Pugh class C	2 (4.5)
PRESENCE OF HBSAG	3 (6.8)	
TREATMENT EXPERIENCED	19 (43.2)	
CO-MORBIDITY	Hypertension	22 (50)
	Diabetes Mellitus	11 (25)
	Gastrointestinal disorders	10 (22.7)
	Hepatocellular carcinoma	7 (15.9)
MEAN NUMBER OF MEDICATIONS (\pm SD)	4.3 \pm 2.7	

FIGURE 1. DAA PRESCRIPTION PATTERN



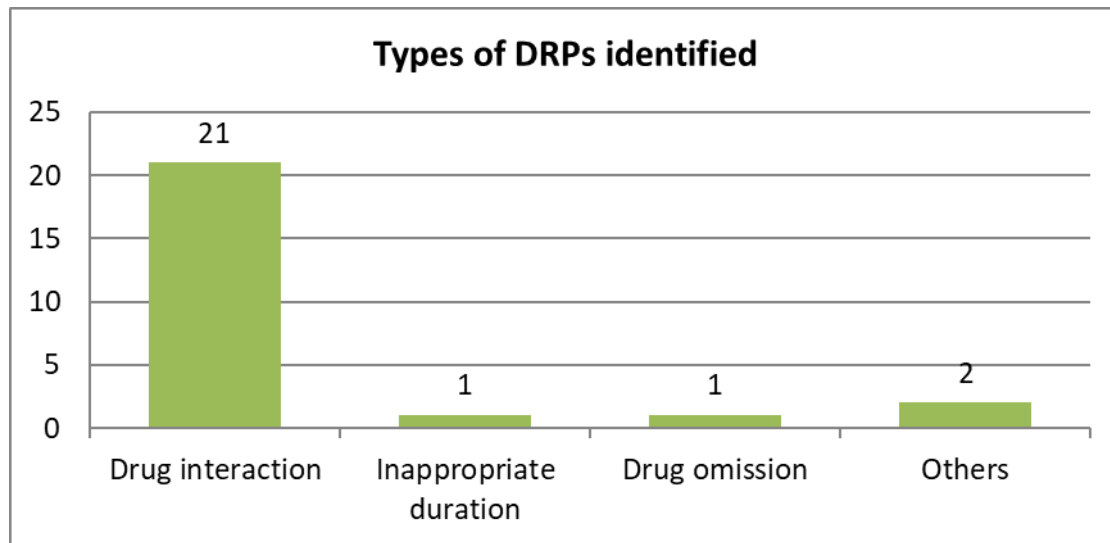
For the 43 patients who finished the DAA therapy, no cases of treatment failure were reported in terms of SVR 12 results. Hepatitis B reactivation was not detected in the 3 cases with hepatitis B co-infection. 25 DRPs were identified as illustrated in Figure 2. The most common DRP was drug-drug

interaction. Around 62% of the interactions involved acid-lowering agents, while the remaining was attributed to CYP450 inhibitors. Pre-emptive treatment of hepatitis B was omitted in 1 case with hepatitis B co-infection. 1 case was documented with inadvertently prolonged DAA regimen

(24 weeks) beyond standard recommendation (16 weeks). Other DRPs identified involved suboptimal laboratory monitoring. In response to the DRPs, 21 pharmacist

interventions were made. 17 cases were provided with pharmacist advice, and 4 required physician referrals.

FIGURE 2. DRPS IDENTIFIED FROM THE SERVICE



DISCUSSION

While various HCV guidelines strongly recommended treatment in nearly all patients with chronic hepatitis C infection, budgeted healthcare providers often prioritized DAA regimen to those with the greatest need due to cost concern. [3, 8, 9] According to the local formulary control, use of DAA was restricted to chronic hepatitis C patients with certain stage of fibrotic changes in liver. Therefore, it was expected to find majority of the patients under service care were suffering from different degree of hepatic impairment. After longstanding history of chronic HCV infection, many patients were approaching elderly ages with co-morbidities including hypertension, diabetes mellitus and gastrointestinal disorders. These co-morbid conditions were managed by physicians from different specialties, so polypharmacy was not uncommon. Even for those non-complicated cases, the choice of DAA alone was already a challenge to healthcare professionals. There were sophisticated pathways in choosing the preferred DAA regimen based on different HCV genotypes and prior treatment history. All these factors put patients at risk for DRPs where pharmacists could contribute.

Despite the limited service scale, it has demonstrated that drug-drug interaction poses a significant obstacle in

optimizing DAA therapy. Similar results were reported in other studies evaluating patients on DAA, with or without HIV co-infection. [10, 11] From our results, the interaction was mostly caused by acid-lowering agents. This was likely driven by the prescribing pattern of predominately sofosbuvir/ledipasvir and sofosbuvir/velpatasvir. Acid-lowering agents are extensively used in common gastrointestinal ailments, and furthermore, many of such products are readily available as over-the-counter medicines. Such interaction was easily overlooked as patients might not disclose proactively. Pharmacist input on comprehensive screening and patient counseling could reduce the risk of treatment failure or toxicities due to hidden interaction.

While there is boxed warning by FDA on risk of HBV reactivation for DAA, [12] it is more concerning for Southeast Asia, being one of the endemic regions for HBV infection. [13] As the complication may cause fulminant liver damage, it is the local practice to screen all patients for HBV serology before DAA initiation. Positive cases for hepatitis B surface antigen (HbsAg) were also prescribed with HBV antivirals in addition to DAA, otherwise, intensive monitoring of liver function and HBV DNA were performed. Although only 3 cases were co-infected with HBV in the study cohort, 1 was missed for HBV treatment, suggesting

potential role of pharmacist in HBV screening and monitoring.

As standard of care, medications were dispensed according to the prescription duration, usually until the next medical follow-up. However, in view of the long follow-up interval after first medical follow-up, short medication refills were arranged to facilitate early detection of DRP with prompt intervention by pharmacists. If patients required early treatment interruption, appropriate control in procurement and dispensing could reduce drug wastage. As the local daily DAA treatment cost over US\$320–\$570, the prevention in drug wastage would translate into huge financial implications for the healthcare system.

As confined by the limited service scale, the study could only discover common risks and challenges in initiating DAA therapy in local population. There was also lack of comparison data on the outcomes of pharmacist intervention. Larger studies covering newer generations of DAA may provide more robust evidence for establishing service models to optimize hepatitis management.

CONCLUSION

The introduction of DAA has created challenge to healthcare providers in hepatitis C management. Patients on DAA commonly encountered DRPs involving drug-drug interactions which may compromise treatment efficacy with huge cost impact. The study provided preliminary evidence on pharmacists' impact on medication management in patients with chronic hepatitis C infection. Through comprehensive medication review and detailed counseling, pharmacists played a role in identifying drug-related problems with prompt intervention to ensure safe and effective use of DAA, thus reducing unnecessary cost wastage.

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