

RGC Ref. No.: UGC/FDS24/B17/21 <p>(please insert ref. above)</p>
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**RESEARCH GRANTS COUNCIL
COMPETITIVE RESEARCH FUNDING SCHEMES FOR
THE LOCAL SELF-FINANCING DEGREE SECTOR**

FACULTY DEVELOPMENT SCHEME (FDS)

Completion Report
(for completed projects only)

Submission Deadlines:

1. Auditor's report with unspent balance, if any: within **six** months of the approved project completion date.
2. Completion report: within **12** months of the approved project completion date.

Part A: The Project and Investigator(s)

1. Project Title

Creating Zero Medicine Wastage and Sustainable Healthcare Supply Chain:

A Closer Cooperation between Private Clinics and Pharmaceutical Companies

2. Investigator(s) and Academic Department(s) / Unit(s) Involved

Research Team	Name / Post	Unit / Department / Institution
Principal Investigator	Dr YUEN Sheung-man / Senior Lecturer	Division of Business & Hospitality Management / PolyU SPEED
Co-Investigator (1)	Dr CHENG Wah-on / Senior Lecturer	Division of Business & Hospitality Management / PolyU SPEED
Co-Investigator (2)	Dr WONG Helen Shun-mun/ Division Head	Division of Business & Hospitality Management / PolyU SPEED
Co-Investigator (3)	Prof YAN Hong / Dean	School of Management / Zhejiang Shuren University
Others	Ms CHIN Yan-wing / Research Assistant	General Office / PolyU SPEED

3. Project Duration

	Original	Revised	Date of RGC / Institution Approval (must be quoted)
Project Start Date	01/01/2022	N/A	N/A
Project Completion Date	31/12/2023	30/06/2024	19/09/2023
Duration (in month)	24	30	19/09/2023
Deadline for Submission of Completion Report	31/12/2024	30/06/2025	19/09/2023

4.4 Please attach photo(s) of acknowledgement of RGC-funded facilities / equipment.

N/A

Part B: The Final Report

5. Project Objectives

5.1 Objectives as per original application

1. To identify the factors determining the cooperation between private clinics and pharmaceutical companies in Hong Kong

2. To develop a new framework for buyer-supplier cooperation and adaptation.

3. To study the motivations and obstacles for private clinics and pharmaceutical companies to establish close cooperation and to adopt an integrated medicine supply chain.

4. To suggest some measures for developing a cost-effective, integrated and sustainable healthcare supply chain in private healthcare sector in Hong Kong.

5. To provide policy recommendations to Hong Kong government on how to reduce medicines wastage in the private healthcare sector and improve the healthcare system of the city.

5.2 Revised objectives

Date of approval from the RGC: N/A

Reasons for the change:

- 1.
- 2.
3.

5.3 Realisation of the objectives

(Maximum 1 page; please state how and to what extent the project objectives have been achieved; give reasons for under-achievements and outline attempts to overcome problems, if any)

Objective 1: The project aims to identify the factors determining the cooperation between private clinics and pharmaceutical companies in Hong Kong. This objective has been fully achieved. The study findings revealed that cooperation is influenced by factors such as the business model of private clinics, the role of pharmaceutical companies in providing bulk-purchase incentives, and the challenges posed by the lack of a centralized procurement platform. The findings highlight the importance of transparent relationships and tailored distribution quantities to minimize medicine wastage. These insights provide a foundation for developing strategies to enhance cooperation and reduce wastage in the healthcare sector.

Objective 2: The project aims to develop a new framework for buyer-supplier cooperation and adaptation. This objective has been fully achieved. The study has successfully identified key factors influencing cooperation and adaptation between private clinics and pharmaceutical companies, such as information exchange and product importance. A conceptual framework has been developed and confirmed to illustrate these inter-related variables.

Objective 3: The project aims to study the motivations and obstacles for private clinics and pharmaceutical companies to establish close cooperation and to adopt an integrated medicine supply chain which has been significantly achieved. This objective has been fully achieved. The study has identified key factors influencing cooperation, such as social exchange, social influences, governmental regulations, goal consistency, reciprocity of the relationship and inter-organizational trust. It has also highlighted the challenges faced by private clinics in managing medicine inventories and the lack of centralized procurement.

Objective 4: The project aims to suggest measures for developing a cost-effective, integrated, and sustainable healthcare supply chain in the private healthcare sector in Hong Kong which has been significantly achieved. This objective has been fully achieved. The study has proposed different strategies for developing a sustainable healthcare supply chain, such as implementing a centralized medicine procurement and inventory management platform, enhancing patient education, and fostering collaboration among healthcare providers. These measures aim to streamline drug management, reduce wastage, and promote sustainability.

Objective 5: The project aims to provide policy recommendations to the Hong Kong government on reducing medicines wastage in the private healthcare sector, and improving the healthcare system has been fully achieved. The study highlights the importance of a centralized medicine procurement and inventory management platform. This platform can help private clinics manage their drug inventories more effectively, reducing the risk of overstocking and expiration. By centralizing procurement, clinics can benefit from bulk purchasing discounts and better inventory tracking, ultimately leading to less waste and more efficient use of resources. Besides, the Hong Kong government should implement policies promoting the separation of prescribing and dispensing of medicines and facilitating the recycling of medicine and medical wastage in the city.

5.4 Summary of objectives addressed to date

Objectives (as per 5.1/5.2 above)	Addressed (please tick)	Percentage Achieved (please estimate)
1. To identify the factors determining the cooperation between private clinics and pharmaceutical companies in Hong Kong	✓	100%
2. To develop a new framework for buyer-supplier cooperation and adaptation	✓	100%
3. To study the motivations and obstacles for private clinics and pharmaceutical companies to establish close cooperation and to adopt an integrated medicine supply chain	✓	100%
4. To suggest some measures for developing a cost-effective, integrated and sustainable healthcare supply chain in private healthcare sector in Hong Kong	✓	100%
5. To provide policy recommendations to Hong Kong government on how to reduce medicines wastage in the private healthcare sector and improve the healthcare system of the city	✓	100%

6. Research Outcome

6.1 Major findings and research outcome

(Maximum 1 page; please make reference to Part C where necessary)

This study addresses the significant issue of drug wastage in private clinics in Hong Kong, highlighting its economic and environmental implications. It primarily focuses on the perspectives of private clinic doctors, pharmacists, practitioners, and drug suppliers regarding the causes, consequences, and potential solutions to this problem. The study adopted a mixed-method approach involving both quantitative and qualitative methods, i.e. focus group interviews and a questionnaire survey.

a. Focus Group Interviews

Four focus group meetings, with a total of 17 participants, were arranged during August 2023 and March 2024. The participants included doctors, pharmacists and practitioners. Through the focus group meetings, key factors contributing to drug wastage were identified, such as over-prescription, lack of patient adherence, and insufficient education on medication management. Furthermore, the participants evaluated the effectiveness of a centralized procurement platform and proposed actionable policies for the government to consider. The findings from the focus group meetings indicate that while private clinics recognize the financial and ecological impacts of drug wastage, they often feel constrained by systemic pressures and patient expectations. Several factors contribute to medication wastage in private clinics, including over-prescription, changes in treatment methods, and medications reaching their expiration date. The participants agreed that while complete elimination of medication waste is unrealistic, implementing effective policies can help minimize it. Strategies such as improved communication among healthcare professionals and pharmacist training are crucial for reducing waste. The participants also suggested implementing medicine recycling programs and enhancing public education on the hazards of medication waste. Additionally, fostering collaboration between private clinics, drug suppliers and the government by a centralized medicine procurement and inventory management platform could streamline drug management and reduce waste. By adopting these strategies, Hong Kong can work towards a more sustainable healthcare model, ultimately benefiting both public health and environmental outcomes.

b. Survey

A survey was carried out among doctors in the private clinic sector in Hong Kong during October 2022 and June 2024. A total of 152 complete surveys were received, consisting of 76 (50%) general practitioners, 60 (39.5%) specialist doctors, and 16 (10.5%) Chinese medicine practitioners. The survey consists of a series of questions collecting the doctors' views about the causes & treatments as well as the economic, health & environmental consequences of medicines wastage in private clinics. It also includes a series of statements measuring factors determining the cooperation between private clinics and pharmaceutical companies. Descriptive analysis and PLS-SEM analysis were conducted on the data collected. The survey findings show that pharmaceutical products, antibiotics and medical tools/equipment are the three most commonly disposed items in private clinics. These items were disposed mainly due to expiration. Most private clinics dispose their unused medicines or medical tools/equipment by simply throwing them into rubbish bins or through chemical waste collectors. The PLS analysis results reveal that social exchange, social influences, government regulations, goal consistency, reciprocity of the relationship and inter-organizational trust are the significant determinants of cooperation between private clinics and pharmaceutical companies. Cooperation influences adaptation and subsequent switching costs for private clinics. Information exchange is a partial mediator between cooperation and adaptation and product importance is a moderator between them.

c. Publications from the Research Project

As of April 2025, two journal manuscripts and two conference papers were published to disseminate the research findings, theoretical and managerial contributions of this project to enrich empirical research in medicine wastage and sustainable healthcare supply chain.

6.2 Potential for further development of the research and the proposed course of action (Maximum half a page)

One potential for further development of this research lies in expanding the scope to explore the impact of specific interventions, such as centralized procurement platforms and enhanced patient education programs, on reducing drug wastage. Another potential for further development of the research is in investing in drug wastage in public health sector in Hong Kong (i.e. public hospitals and clinics).

The proposed course of action includes implementing a drug collection program, fostering collaboration between private clinics, public health-care and government; as well as enhancing public education on proper medication disposal and adherence. Longitudinal studies could assess the long-term effectiveness of these proposed policies and practices on the drug recycling attitude and behaviors of different stakeholders, in particular private clinics, doctors, practitioners, patients, as well as the general public.

7. Layman's Summary

(Describe in layman's language the nature, significance and value of the research project, in no more than 200 words)

This research project focuses on the problem of drug wastage in private clinics in Hong Kong. It explores why so many medicines go unused or expired, which not only wastes money but also harms the environment. The study involves interviews, focus group meetings and questionnaire survey with private doctors, practitioners and pharmacists to understand their views on the causes and solutions for this issue. Key reasons for drug wastage include over-prescription, patients not following their medication plans, and a lack of education on how to manage medicines properly. The research suggests that better patient education, improved communication among healthcare providers, and a centralized system for managing drug supplies could help reduce waste. Also, the research findings reveal that social exchange, social influences, government regulations, goal consistency, reciprocity of the relationship and inter-organizational trust are the significant determinants of cooperation between private clinics and pharmaceutical companies. By addressing these issues, the project aims to create a more efficient and sustainable healthcare system in Hong Kong, benefiting both public health and the environment.

Part C: Research Output**8. Peer-Reviewed Journal Publication(s) Arising Directly From This Research Project**

(Please attach a copy of the publication and/or the letter of acceptance if not yet submitted in the previous progress report(s). All listed publications must acknowledge RGC's funding support by quoting the specific grant reference.)

The Latest Status of Publications				Author(s) (denote the corresponding author with an asterisk*)	Title and Journal / Book (with the volume, pages and other necessary publishing details specified)	Submitted to RGC (indicate the year ending of the relevant progress report)	Attached to this Report (Yes or No)	Acknowledged the Support of RGC (Yes or No)	Accessible from the Institutional Repository (Yes or No)
Year of Publication	Year of Acceptance (For paper accepted but not yet published)	Under Review	Under Preparation (optional)						
2024	-	-	-	Yuen S.M., Cheng C and Wong H.S.M.	<p>Title: Avoidance of Medicine Wastage in Private Clinics In Hong Kong: Practitioners' Perspectives</p> <p>Journal: Asia Pacific Journal of Health Management, 19(2), Article i3881.</p> <p>https://doi.org/10.24083/apjhm.v19i2.3881</p>	No	Yes (Annex 1)	Yes	Yes

The Latest Status of Publications				Author(s) (denote the corresponding author with an asterisk*)	Title and Journal / Book (with the volume, pages and other necessary publishing details specified)	Submitted to RGC (indicate the year ending of the relevant progress report)	Attached to this Report (Yes or No)	Acknowledged the Support of RGC (Yes or No)	Accessible from the Institutional Repository (Yes or No)
Year of Publication	Year of Acceptance (For paper accepted but not yet published)	Under Review	Under Preparation (optional)						
2024	-	-	-	Cheng C, Yuen S.M. and Wong H.S.M.	Title: Medicine Wastage in Private Clinics: Drug Suppliers' Perspective on the Causes and Measures to Reduce It Journal: Information Management and Business Review https://doi.org/10.22610/imbr.v16i3(I)S.4048	No	Yes (Annex 2)	Yes	Yes

9. Recognized International Conference(s) In Which Paper(s) Related To This Research Project Was / Were Delivered

(Please attach a copy of each conference abstract)

Month / Year / Place	Title	Conference Name	Submitted to RGC <i>(indicate the year ending of the relevant progress report)</i>	Attached to this Report <i>(Yes or No)</i>	Acknowledged the Support of RGC <i>(Yes or No)</i>	Accessible from the Institutional Repository <i>(Yes or No)</i>
March 2023 Vienna, Austria	The cooperation and adaptation in healthcare supply chain in Hong Kong: A literature review	<i>Conference on Applied Research in Management, Business and Economics (ICARBME 2023)</i>	Yes	Yes (Annex 3)	Yes	Yes
May 2024 Penang, Malaysia	Medicine wastage in private clinics: Drug suppliers' perspective on the causes and measures to reduce it	<i>The 6th Advances in Business Research International Conference 2024 (6th ABRIC 2024)</i>	N/A	Yes (Annex 4)	Yes	Yes

10. Whether Research Experience And New Knowledge Has Been Transferred / Has Contributed To Teaching And Learning

(Please elaborate)

Yes, the research findings were shared as case studies in the class of BHMS4198 Global Supply Chain Management for students to learn the issues of medicine wastage and importance of healthcare supply chain. Besides, the research experience and new knowledge were shared with internal academics in The Conference on Green Technology and Navigating Sustainable Business Practices 2024 held in December 2024 in Hong Kong.

11. Student(s) Trained

(Please attach a copy of the title page of the thesis)

Name	Degree Registered for	Date of Registration	Date of Thesis Submission / Graduation
N/A			

12. Other Impact

(e.g. award of patents or prizes, collaboration with other research institutions, technology transfer, teaching enhancement, etc.)

- Wrote articles for newspaper column to share the ideas of Avoidance of Medicine Wastage in community (Annex 5)
- Invited to join the seminar (May 2024) in Society for Community Organization (SoCO) to share ideas of Avoidance of Medicine Wastage
- Work with NGOs like JCI for wasted drug collection campaign in Year 2023

13. Statistics on Research Outputs

	Peer-reviewed Journal Publications	Conference Papers	Scholarly Books, Monographs and Chapters	Patents Awarded	Other Research Outputs (please specify)	
No. of outputs arising directly from this research project	2	2	0	0	Type	No.
					Newspaper column	2

14. Public Access Of Completion Report

(Please specify the information, if any, that cannot be provided for public access and give the reasons.)

Information that Cannot Be Provided for Public Access	Reasons