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承百載春風化雨
傳鏡湖仁愛關懷



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**承百載春風化雨
傳鏡湖仁愛關懷****Unitary Caring Science: Caritas Compassion Transpersonal Theory**Jean Watson^{1,2}

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¹ Watson Caring Science Institute² College of Nursing Anschutz Medical Center, University of Colorado**1 Introduction**

Tumultuous times in our world require a new/old unitary worldview: an evolving consciousness about converging ideas of nursing, because we dwell in the sacred circle of life and death and beyond. Post-COVID has awakened us to the reality of oneness of all, encompassing a quantum leap for a new worldview, a worldview of unity and connectedness of all things.

In my writing I refer to this shift as unitary caring science for nursing, caring, healing and health care. We are faced with one world/one humanity/ one Planet (Watson, 2018, 2021). Transpersonal caring is guided by the underlying ethic of and worldview of unity, which connects persons, heart- to- heart with loving kindness. Transpersonal refers to an ontology of Being and Becoming, in relation beyond separation. Transpersonal also means 'beyond ego' whereby one is authentically present in the moment with compassion, open to an infinite field of possibilities (Watson, 2018). Transpersonal caring relationship transcends time, space, and physicality; it is held philosophically within the context of a unitary caring science intersects as a larger framework of science.

2 The Framework of Unitary Caring Science and Transpersonal Theory

The framework of unitary caring science and transpersonal theory includes the following principles: The Ethic of Belonging; The Ethic of Face; and The Ethic of Hands.

Each one of these informs the transformative unitary paradigm for Nursing and specifically my work in philosophy and science of caring as well as transpersonal caring theory.

2.1 The Ethic of Belonging

The Ethic of Belonging was posed by French philosopher Levinas (1969) and submitted that we all 'Belong to the Infinite Field of Universal Cosmic Love', before our Separate Being. This worldview of unity and oneness of all reflects a quantum universe of connectedness, which transcends our separate ego physical self. This ethic also represents the reality of the sacred circle of life and death to which we all belong, before birth and after death, awakening the sacred science of caring. Further, Levinas posed Ethic of Belonging as the first principle of science. Thus, it is a foundational starting point and worldview for unitary caring science and my most current theoretical philosophical perspective.

2.2 The Ethics of Face

The Ethics of Face, likewise was posited by Levinas (1996) as a core principle of human evolution

and survival of humanity. His work on Ethics of Face acknowledged that humanity either evolves further as infinite evolution to higher consciousness – or – we totalize our humanity and each other. The view is in spite of the paradox of virtual reality; in that “the only way we can survive as humans at this point in human history is through the Face -to-Face connection”. When we look into the face of another person, we are looking into the mystery and infinity of human soul; when we look into the mystery and infinity of other, it mirrors back the infinity of our own soul. The face to face connection also reflects the Ethic of Belonging that unites us across time and space.

2.3 The Ethics of Hands

The third principle of Unitary Caring Science is posited by ethicist Logstrup (1997), a Danish philosopher. His philosophy highlighted the metaphorical and literal reality that we hold another person’s life in our hands. This ethic is core to nursing and human caring practices. In his words he noted: “the life in our hands is a sovereign expression of life as given to us, before and beyond ego; with expressions of trust, love, honesty, forgiveness, gratitude- beyond feelings that are negative expressions of life...”. (Logstrup, 1997, p.18.). He referred to this view as an Ethical Demand, to take care of the life which is in our hands. Within caring science and the infinite energy of love, it is important to highlight that our hands are connected with our heart; the heart is the very source of love, caring, compassion and our inner truth. So the ethics of hands takes on important meaning for nursing and the use of our hands in healing.

3 Ten Caritas Processes®

The Ten Caritas Processes of the transpersonal caring theory provide core language of the universals of human caring, which nurses are offering every day. However, because Caring has not been named, it has been invisible, without acknowledging, naming,

documenting, researching. Further caring language has not been used as the foundational ethical, philosophical guide to micro and macro caring practices, contributing to patient and nurse caring-healing and health outcomes. It must be acknowledged in this postmodern time, that any profession without its own language does not exist. It is also important to know that these 10 Caritas Processes are located within the larger unitary caring science paradigm, the most mature level for honoring nursing’s phenomenon and vicissitudes of human experiences.

3.1 Transpersonal Caring Moment

The nurse- patient relation in any given moment is affected by the presence, intentionality, consciousness, authenticity of the nurse in a given moment. Each caring moment is informed by nurse’s theory, philosophy, ethic, and authentic use of self in a given moment. Unitary Caring Science is context for any and each transpersonal caring moment, guided by the professional nurse’s evolution and consciousness. Such mature practice at micro and macro level can be framed as Caring Praxis, beyond usual practice of Doing, transformed toward a Relational Ontology of Being. The ten Caritas Processes provide the language and theoretical foundation and structure of nursing. However, where the theory lives is in a Caring Moment, which is transpersonal, in that each moment is unique and goes beyond two individuals; rather beyond ego of nurse or even ego of nursing profession; rather nurse being authentically present, open and receptive to see, to hear and to honor with dignity each individual.

3.2 The Ten Caritas Process

3.2.1 Caritas Process 1

Embrace – Practice of Loving Kindness, Compassion and Equanimity, for Self-first: before one is able to offer another authentic caring. Professional theory-guided practice requires informed moral action, such as honoring each of the Caritas Processes as guide for self as well as other.

3.2.2 Caritas Process 2

Inspire – Faith and Hope, through authentic presence. Honoring the subjective beliefs and inner life world of other; appreciating sacred presence. Staying within other's frame of reference. There is so much research and knowledge about the role of faith and hope; the role of religion and one's inner belief system which affects outcomes. In this process the nurse honors the whole person and their inner world beliefs even if they differ from mainstream medicine. Here the nurse works strictly from patient/family beliefs, not judging or attempting to impose own beliefs; while inspiring and enabling patient/family practices.

3.2.3 Caritas Process 3

Trust – Transpersonal Self - being sensitive to self/others- going beyond ego to transpersonal presence. Trust is immediately detected by the nurses' presence, intentionality, heart-centered awareness, holding space for pausing, listening, hearing beyond words. As soon as the nurse walks into a patient's room, the patient will know whether they can trust this nurse or not.

3.2.4 Caritas Process 4

Nurture – Relationship. Heart to heart authentic relation via trust and loving presence. Holding Caritas Consciousness in relation with other. Everything is in-relation and here the nurse moves beyond Doing Nursing to Being authentically presence. Caritas Process 3 and 4 go hand in hand.

3.2.5 Caritas Process 5

Forgive-All – Allow for expression of positive and negative feelings; non-judgmental acceptance, holding sacred space to listen to another's story. Listening to other's story may be the greatest healing gift – where for perhaps for the first time, they hear themselves beyond the usual inner script; Nurse is there holding sacred space allowing patient to hear self; result they often come up with new solutions and new options for self; for self-care, self-knowledge, even self-healing approaches.

3.2.6 Caritas Process 6

Deepen – Creative self; nurse and patient move beyond 'problems' to strengths and creative solutions; allow for creative emergence. Invite an Expanded epistemology – allowing for multiple and all ways of knowing to be considered, not just empirical data alone. It is unethical to limit our knowledge and ways of knowing to only one form of knowledge. Subjective meaning and inner life experiences also count as knowledge, as well as personal, intuitive, aesthetic, ethical, spiritual as well as empirical-scientific knowledge.

3.2.7 Caritas Process 7

Balance – Learning with authentic teaching; appreciating inner listening and subjective meaning for understanding one's inner life world, leading to heart-centered wisdom. This process results in 'coaching' other in self-caring, self-knowledge, self-control, self-choices, and self-healing approaches. Without learning, there is no teaching. It requires realizing that information is not knowledge, knowledge alone is not understanding, understanding is not the same as internalizing, internalizing leads to wisdom.

3.2.8 Caritas Process 8

Co-create – Caritas Field; create healing environment, by 'being' the caritas field of loving - trusting, heart- to- heart connections. The Caritas conscious nurse is the healing environment. We can have the most beautiful physical environment, but if the humans in the field are not caring, the environment can be toxic or biocidal for nurse as well as patients/families.

3.2.9 Caritas Process 9

Minister – humanity and basic needs with reverence as sacred acts, sustaining human dignity, viewing bodyspirit as one. Helping another with basic human needs when they are unable to do for self, is one of greatest healing acts nurses offer to humanity. A Caritas conscious nurse knows they are not just touching the body, but also the mind, the heart, and the soul of

patient. Requiring a Caritas loving consciousness to minister to another as a sacred gift.

3.2.10 Caritas Process 10

Open – to infinity and evolution of consciousness; allowing to spiritual existential unknowns, beyond conventional medical science, open to miracles and mystery of caring-healing and infinite possibilities. Conventional science and Western mindsets of medical science do not have all the answers to human health and healing. Nurses experience miracles and mystery in patient outcomes every day (Watson, 2019).

3.3 Summary Note on Caritas Processes®

It is important to note that the Caritas Processes are not linear. They are a gestalt of the whole Caritas Consciousness in any given moment. It is like a hologram. The whole Caritas Consciousness is present in any given moment. Transpersonal caring moment represents any of the Caritas Processes which transcend time, space, and physicality. A transpersonal caring moment of any of the Caritas processes lasts with the patient and the nurse as long as they live, informing the next moments of their life. Thus, the Ethic of Belonging; the Ethic of Face and Ethic of Hand are present through Transpersonal Caritas in any given moment. This dynamic is a life-giving and life-receiving exemplar of Caritas Praxis.

As a transition from overview of Caring Science Caritas Processes and Transpersonal Moment it is helpful to examine the congruence between Unitary Caring Science/Caritas Processes and Transpersonal with the latest definition of Nursing from American Nurses Association (ANA) (2021).

Nursing integrates the art and science of caring and focuses on the protection, promotion, and optimization of health and human functioning; prevention of illness and injury; facilitation of healing, and alleviation of suffering through compassionate presence. Nursing is the diagnosis and treatment of human responses and advocacy in the care of individuals, families, groups,

communities, and populations in recognition of the connection of all humanity.

The highlighted areas with the latest ANA definition reflect a Unitary Caring Science Paradigm and Transpersonal Caring values as part of the evolved definition of nursing. It is the first time ANA has included caring in its definition; previously the definitions were medicalized -clinicalized views of nursing and humanity, e.g., diagnosis and treatment language.

Together Unitary Caring Science and Transpersonal Caring Theory provide a mature disciplinary foundation for Nursing for this time of change, so needed to sustain human caring and human dignity for both nurses and patients alike. Identifying the Ethics and Quantum Transformative thinking for Unitary Caring Science provide a universal timeless framework for nursing past, present and future.

In summary I have identified the essence and advantages of expanding Nursing and Unitary Caring Science Paradigm and Transpersonal Caritas as a way forward to sustain nursing's global covenant with humanity.

4 WATSON ESSENCES OF UNITARY CARING SCIENCE

The Unitary Caring Science contains the following essences:

- 1) Brings infinity of LOVE back into Nursing and Health Care/Science
- 2) Provides Universal Nursing Language for Universals of Caring Phenomena
- 3) Introduces Transpersonal - Metaphysical –Sacred
- 4) Integrates ancient and contemporary Energetic Caring Healing Arts
- 5) Provides a Full Circle of Caring Science evolution: e.g. Unitary Philosophy – Ethic – Theory – Micro/macro Caritas Praxis/Education – Measurements and Research

5 Final Summary

Unitary Caring Science: Transpersonal Human Caring provides a full circle of knowledge to guide the practice, research, education, and leadership for Nursing's' future. The core Philosophy, the Ethical principles of Unitary Caring, Core Values that guide Caritas Processes as theoretical frame for micro and macro practices; combined with measures and outcomes of Caring as essential to all healthcare. Philosophy / Ethic / Values / Theory / Practice / Research-Measures / Outcomes Without nursing advancing within its own philosophical -ethical – theoretical framework, it is doomed to remain as very good technicians of a totally new quantum universe, required for caring, healing and health for all.

Declaration

This paper is based upon a conference presentation in Lisbon, Portugal, June 2023. Reprinted with permission from Dr. Jean Watson.

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整體關懷科學與超個人理論：Watson 的博愛關懷理論

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1 序言

當世界處於混沌不安的時期，我們需要一種新舊合一的世界觀：一種將護理理念趨同化的發展意識，因我們活在生死輪迴的神聖循環中。新冠病毒後疫情時代喚醒了我們，讓我們認清萬物一體的現實，更帶我們躍到新的維度看世界，看宇宙一體，萬物相連。

本文將以此轉變作為整體護理科學中，護理、

關懷、治療和保健的根據，審視我們在世界/人文/星球皆一前如何自處（Watson, 2018, 2021）。

超個人關懷植根於以愛和良善連結人心的合一的倫理和世界觀。超個人是指存在和演變，而非分離和割裂；是超越本我，是此時此刻懷著激情的存在，對無限的可能持開放態度（Watson, 2018）。超個人關懷關係跨越時間、空間和肉身，本質上屬於整體關懷科學，而整體關懷科學屬於寬域科學範疇。

2 整體關懷科學與超個人理論的框架

整體關懷科學和超個人理論的架構包括以下原則：歸屬倫理 (The Ethic of Belonging)、面容倫理 (The Ethic of Face) 和掌控倫理 (The Ethic of Hands)。

其中每一項都構建了護理的變革性統一範式，特別為我在護理哲學和科學，以及超個人關懷理論方面的工作提供依據。

2.1 歸屬倫理

歸屬倫理是由法國哲學家列維納斯 (Levinas, 1969) 提出的。他認為，在我們獨立的存在之前，我們都「屬於宇宙之愛的無限領域」。這種萬物一體的世界觀反映了一個相互聯繫的量子宇宙，它超越了我們獨立的肉體自我。這種倫理也體現了我們所有人在出生前和死後都隸屬神聖生死循環的現實，喚醒了神聖的關愛科學。此外，列維納斯將歸屬倫理視為科學的首要原則。因此，它是整體關懷科學的基礎起點和世界觀，也是我當前的理論哲學觀點。

2.2 面容倫理

面容倫理同樣被列維納斯 (Levinas, 1996) 列為人類進化和存活的核心原則。他的面容倫理研究認為，人類要麼隨著無限進化而進一步進化到更高的意識，要麼我們將彼此各自的人性整合在一起。儘管虛擬現實存有悖論，但「唯有透過面對面的連結，我們才能在人類歷史的這一刻，作為人類生存下去」。當我們凝視另一個人的臉時，我們就是在凝視人類靈魂的神秘和無限；當我們凝視他人的神秘和無限時，也映照了我們自身靈魂的無限。面對面的連結同時反映了歸屬倫理如何跨越時間和空間將我們連結在一起。

2.3 掌控倫理

整體關懷科學的第三個原則是來自丹麥哲學家倫理學家羅斯特魯普 (Logstrup, 1997) 提出的。他的哲學思想強調我們將他人的生命掌握在手中，這是一個形義上的比喻，同時亦可按字面的意義理解。這個倫理是護理和人類關懷實踐的核心，用他的話來說就是：「我們手中掌握的生命，就是最不折不扣的生命，在自我之前，同時亦超越自我；伴隨的信任、愛、誠實、寬恕、感激 — 這一切都超越了

生命另一面的消極情感」。他將照顧我們手中的生命稱為倫理需求。在關懷科學和愛的無限能量中，必須要強調我們的手和心是相連的；心是愛、關懷、同情心和內心真理的來源。因此，掌控倫理對於護理和用手來療癒具有重要意義。

3 十大關懷照護程序

超個人關懷理論的十大照護程序為護理人員日常護理工作提供提供了一套核心語言。但是，因為「關懷」還未被命名，它不為人所見，沒有被承認、沒有被正名、沒有記錄、沒有研究，更深層的關懷語言亦尚未被用作微觀和宏觀護理實踐的基本倫理及哲學指南，以致未能對護患間關懷治療發揮作用。我們必須知道，在這個後現代時代，沒有一個專業範疇是不具備自己的一套語言的。同樣要知道的是，這十大關懷照護程序是在更大的整體關懷科學範式中進行的，盡顯在人世變遷中對護理的尊重。

3.1 超個人關懷時刻

任何特定時刻的護患關係都受到護理人員在特定時刻的存在、意向、意識和真實性的影響。每個關懷時刻都受到護理人員自身的理論、哲學、道德和他們在特定時刻真實自我所影響。所有超個人關懷時刻都是以整體關懷科學為背景，以專業護士的演變和意識為引導。這種在微觀和宏觀層面上的成熟實踐可以被歸納為「關懷實踐」，這種實踐超越一般的「行動」實踐，並向「存在」的關係本體論轉變。十大關懷照護程序為護理提供了專業語言和理論的基礎結構。然而，護理理論通常體現於超個人的關懷時刻，因為每個時刻都是獨特的，並且超越了兩個個體；非但超越護理人員的自我，甚至超越護理專業的自我；相對於自我，護士反而要真切地存在當下，用開放且接納的態度去看、去聽，並尊重每個個體的尊嚴。

3.2 十大關懷照護程序

3.2.1 關懷照護程序一

擁抱 — 展現慈愛、慈悲和平靜，以自我為先，然後才能為他人提供真正的關懷。跟從專業理論指導的實踐需要明智的道德行動，例如遵從每個關懷照護程序作為自我和他人的指南。

3.2.2. 關懷照護程序二

激發 — 透過真切的存在激發信念和希望。尊重他人的主觀信仰和內心世界，欣賞神聖的存在，尊重別人的判斷準則。關於信仰和希望的作用、宗教的角色和一個人的內在信仰體系的研究和觀點有很多，這些都會影響護理的效果。在此程序中，護士須尊重患者整個個體及其內心信仰，即使它們與主流醫學不同。護理人員須嚴格按照患者 / 家屬的信念進行工作，而不是批判或試圖強加自己的信念；同時亦應激勵和促進患者 / 家庭對自身信念的實踐。

3.2.3 關懷照護程序三

信任 — 超個人的自我應該對自己或他人敏感，從而超越自我，達到超個人的存在。信任最能展現在護理人員當下的狀態、意圖、以心為中心的意識、停頓、傾聽、聽出對方字裡行間的意思。當護士走進患者的房間時，患者當下就會知道他們是否可以信任這位護士。

3.2.4 關懷照護程序四

培養關係 — 在信任和愛的基礎上建立心連心的真誠關係。在與他人的關係中保持博愛關懷的意識，因一切都是相關的，在這理論中，護士不只進行護理工作，而是真切地存在在一段關係中。關懷照護程序三及四是相輔相成的。

3.2.5 關懷照護程序五

寬恕所有 — 允許表達正面和負面的感受；不帶批判地接受，保留神聖的空間來聆聽他人的故事。聆聽別人的故事可能是最好的療癒禮物 — 這也許是他們第一次聽到自己內心以外的感受；護士會在這裡守護著神聖的空間，讓患者聽見自己的聲音，結果他們經常用這種方式為自己想出新的解決方法和新的選擇；這也是一種自我保健、自我認識，甚至是自我療癒的方法。

3.2.6 關懷照護程序六

深化具創造性的自我 — 護理人員和患者不應糾結於「問題」，而應集中在發挖能力和創新方法，允許創造性的出現。引入擴展的知識論 — 考慮多種理論和應用所有認知方法，而不僅僅是參考經驗數據。將我們的知識和認識方式限於一種形式是不道德的，主觀意義和內在生活經驗也算知識，個人的、

直覺的、美感的、倫理的、精神的以及經驗科學的同樣也是知識。

3.2.7 關懷照護程序七

平衡 — 以真實的教學方式學習；欣賞內在聆聽和主觀意義來理解一個人的內心世界，從而獲得以心為中心的智慧。這個程序能指導他人學會自我照顧、自我了解、自我控制、自我選擇和自我療癒。沒有學習，就沒有教學。這個程序需要我們認識到資訊不是知識，而光有知識並不等於理解；理解不等於內化，皆因內化會帶來智慧。

3.2.8 關懷照護程序八

共創關愛空間 — 透過「成為」充滿愛、信任、心連心的關愛空間的一部分來創造一個療癒環境。具關愛意識的護理人員本身就是一個治癒環境。我們可以建造一個最漂亮的實體環境，但如果在場的人不具關懷的心，這對護理人員、患者及其家屬來說可能反而是一個有害的環境。

3.2.9 關懷照護程序九

協助滿足人類的需求 — 尊重人性的基本需求是神聖的行為，維護人的尊嚴，將身體精神視為一體。當他人無法自行滿足基本需求，伸出援手幫助他們，這是護理人員能為他人提供的最好的療癒行為。具關愛意識的護理人員知道，他們的行為並非只觸及患者的身體，同時也觸及患者的思想、心靈及靈魂。協助他人滿足需求這個神聖的行為需要有良好的關愛意識。

3.2.10 關懷照護程序十

接受意識的無限和進化 — 允許精神存在的未知，跨越傳統醫學，對關懷療癒的奇蹟效果以及無限可能持開放態度。傳統科學和西方醫學思維並不能解答人類健康和治療的所有問題，護士每天都會親歷患者治療結果的奇蹟和神秘 (Watson, 2019)。

3.3 關於十大關懷照護程序的摘要說明

值得注意的是，關懷照護程序並非線性的，它們是整個關愛意識的完形。它就像一個全息圖，整個關愛意識在任何特定時刻都存在。超個人關懷時刻代表任何超越時間、空間和物質的關懷照護程序。這些時刻會伴隨患者和護理人員一生，並影響他們將來的生活和工作。因此，歸屬倫理、面容倫理和

掌握倫理在任何時刻都透過超個人關懷的方式呈現。這種相互作用正是關愛實踐賦予生命和接受生命的典範。

在完成關懷科學、關懷照護程序和超個人時刻概念的陳述後，現在按美國護士協會 (American Nurses Association [ANA], 2021) 最新的護理定義來檢視上述概念之間的一致性，會幫助我們有更深入的理解。

護理融合了照護的藝術和科學，專注於保護、促進和最佳化人類健康和功能，預防疾病和傷害、促進療癒，並透過關愛減輕痛苦。護理是對人類反應的診斷和治療，並在全人類相互連結的大前提下，倡導對個人、家庭、團體、社區和人群的護理。

ANA 最新定義的重點反映了整體關懷科學範式和超個人關懷的價值觀，是護理定義演變的一部分。這是 ANA 首次將關懷納入護理的定義；其先前的定義是護理和人性的醫療化及臨床化觀點，例如診斷和治療語言。

整體關懷科學和超個人關懷理論共同為護理學提供了成熟的學科基礎，以應對這個變革時代的需要，從而維持護理人員和患者的人文關懷和人類尊嚴。整體關懷科學的倫理和量子變革思維為過去、現在和未來的護理提供了一個通用且不過時的框架。

總括來說，本文指出了擴展護理和整體關懷科學典範和超個人關愛的本質和優勢，以此作為維持人文與護理的全球合作發展方向。

4 Watson 整體關懷科學的四項精髓

整體關懷科學包含以下精髓：

- 1) 將無限的愛帶回到護理和健康照護 / 科學當中
- 2) 為普遍的關懷現象提供通用的護理語言
- 3) 介紹超個人—形上學—神聖理念
- 4) 融合古今的能量關懷療癒藝術
- 5) 提供全方位的關懷科學演化：即整體哲學—倫理—理論—微觀 / 宏觀的關愛實踐 / 教育—測量與研究

5 總結

整體關懷科學：超個人的人文關懷提供了全方位的知識來指導未來護理的實踐、研究、教育和領導能力。未來護理應將核心理念、整體關懷的道德原則、關懷照護程序作為微觀和宏觀實踐理論架構的核心價值，與所有對健康照護至關重要的護理措施和結果相結合。哲學 / 倫理 / 價值觀 / 理論 / 實踐 / 研究方法 / 結果，以上種種，如果護理學沒有在自己的哲學—倫理—理論框架內取得進步，在全新的需要關懷療癒和人人健康的量子宇宙裡，它註定只能成為一項好的技術。

聲明

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護理傳承與創新 Nursing Heritage and Innovation

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承百載春風化雨
傳鏡湖仁愛關懷

淺談臨床推動護理研究之策略

劉少華^{1*}

【摘要】本文論說護理研究在臨床推動之策略，以文獻回顧及循證實踐的相關理論，論證在臨床環境施行務實性護理科研的思路。透過：1) 理解臨床現況，發現及歸納臨床問題；2) 以理論框架及循證依據支持有效的護理介入及實踐；3) 預測及評價臨床效果，在落實臨床實踐注意應控制非預期不良事件發生，及著重成本效益。藉以促進臨床措施及決策的提升，改善人類健康，創造專業相關知識並貢獻專業。

【關鍵詞】 護理研究 推動 策略

The Strategies of Promoting Nursing Research in Clinical Settings

Sio Wa Lao^{1*}

[Abstract] This article discussed about the strategies of promoting nursing research in clinical settings. Literature review of evidenced-based relevant theories were applied to demonstrate the idea of implementing practical nursing research in clinical environment. The process included: 1) understanding the clinical situation, identifying, and summarizing the clinical problems and needs, 2) supporting effective nursing interventions and implementations with a theoretical framework and evidenced-based recommendations, 3) predicting and evaluating clinical outcomes, being aware to control and prevent the unexpected adverse events, and also concerning cost-effectiveness in implementing innovative nursing intervention. Recommendations were provided as to promote clinical practice and clinical decision-making, improve human health, create professional knowledge and contribute to the profession.

[Key Words] nursing research promotion strategies

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1 前言

護理科研始祖 – 南丁格爾在 1854 年克里米亞戰爭透過觀察軍醫院環境及照顧傷兵的經歷，並分析堆積如山的軍事檔案，指出克里米亞戰役中英國軍隊的死亡原因是戰場外的感染相關疾病，及戰場上受傷後沒有得到適當照護而傷重的死亡，反映由感染疾病造成的死亡人數往往遠超直接在戰場上造成的傷亡。南丁格爾蒐集數據，分析資料並利用統計學說明問題，把資料製成圓形圖 (Pie Charts) 客觀論說及呈現問題所在，說服了當時英國政府及軍方，正視軍隊保健並推動醫療改革 (陳綱華、李選、張綺紋, 2005)。

上述經驗說明在充足洞察臨床問題，或對臨床難題有足夠的敏感度，用科學方法尋找答案，進而有效解決問題並創造知識。專家認為護理研究是以系統性的方法來：1) 發現及歸納臨床問題，2) 提供有效的護理措施，3) 預測及評價臨床照護效果、控制非預期不良事件發生及減少實務工作成本；藉以促進及制定臨床措施及決策，提升人類健康，並創造專業相關知識、貢獻專業 (胡文郁等, 2020)。

2 理解臨床現況，察覺護理問題及病人需求

2.1 發現及論說臨床問題

臨床研究多始於由臨床問題所引發，運用系統性及科學性的方法來解決問題；目的在於產生新知識、檢定新的現象或理論。護理人員的照護對象以人為本，服務範圍廣泛，跨專業合作來促進全面及全人照護，故凡有助專業發展，提昇照護質量及效益的相關議題，均為可發展的研究範疇。現時臨床研究的啟發思路，多源於提供高質量的病人照護、介入循證健康策略、或結合跨專業協作等角度出發；臨床問題的發現或知識的激發過程，多源自病人的照護需求或疾病同行經歷、臨床人員的專業效能或職業經驗、醫療機構的服務壓力或治療成效、社群健康需求或社區健康服務延續等 (穆佩芬, 2013)，透過觀察臨床現況、翻查或收集臨床數據資料、訪問病人或臨床人員經驗等方式，客觀化地、量化地反應問題，並藉由臨床問題相關的對象、環境、干預方式或效果等差異，或由目前臨床現況或實務操作與現存文獻的比較，推論及論說問

題的確立。

護理人員作為專業的一員不但能提出問題，有能力及義務應用現存的業界流行的科學，或發現臨床現況與科學論證意見相者間的差距，更需要客觀全面做好文獻查證及問題分析，釐清問題及其相關因素，才能訂立解決問題的目標，提出科學且創新方法解答臨床問題，產生及綜合應用的實證能影響及塑型於護理專業，並同時帶動醫院層面的護理工作改進，令護理服務更安全有效。

2.2 以理論框架支持護理介入及實踐

護理實踐的介入內容常以理論框架來解釋其關聯性或因果性，理論框架能解釋護理介入所引起或造成的結果，也能說明介入措施所導致結果變化的原理；因此，理論框架常用以指引發展護理措施的方向。理論框架的應用對於護理實踐或護理科研的效果預測也是非常重要，如措施介入只建基於一般概念，則措施的科學性及可用性、效果的有效性及其可推廣性將會被削弱 (林玉萍、王采芷, 2016)。護理研究能整合學術理論於臨床學習及實踐中，對研究倡導的循證護理提供相關性、重覆性、轉移性等價值，有助臨床人員進一步投入應用所推動的介入實踐或效果應用 (Lehane et al., 2021)。

3 優化及改善臨床護理工作，提升照護水平及質量

3.1 循證為本的護理措施

循證實踐 (Evidence-based practice, EBP) 的重要性，體現於從機構組織層面作帶領及，真正推動把 EBP 及科研綜合應用於臨床操作中，日新月異的科學前沿知識需要恆常分享、學習、使用及評價，並運用機構的基礎設署及現有資源，鼓勵及支持護理人員繼續為病人及執業環境，探索及創造更理想及安全的護理實踐；EBP 的應用涉及發現，並把最可及的實證轉譯傳達至臨床的過程，需要連結臨床決策、臨床專科知識及病人需求 (Erickson & Pappas, 2020)。

應用臨床指南、臨床路徑及制定護理標準，每一步都是臨床頗為熟悉的循證為本的護理實踐過程。然而，若面對部份醫療照護議題未存在成熟的臨床指南，則要向相關科學研究著手，按 quality appraisal 準則，對研究質量進行批判後，選取值得

信賴的研究，才能尋找指導臨床措施的方向。近年來較推廣的轉譯研究 (Translational Research, TR)，根據美國國家衛生研究院－國家推進轉化科學中心的定義，轉譯是轉化在實驗室、醫療場所和社區所見的觀察研究成果，應用於新的人體研究或臨床測試上，以干預介入措施來發展預防、診斷或治療疾病的過程，目的在於把研究成果用於對人類利益福祉有快速效益的用途上，以改善個人或公眾健康。轉譯科學 (Translational Science) 是從每個轉譯步驟中，理解科學及其潛在的原則 (Weiss et al., 2018)。轉譯研究包括：

1. 從實驗室研究或臨床前期研究的發現過程，對人類健康有影響力；
2. 研究結果的綜合應用過程，能引導人類研究的發展，以助建立試驗或研究；及
3. 研究目的旨在提昇在學科上應用最佳實踐；預防及治療策略上的成本效益也是轉譯研究的重要部份。

從理論或科研知識，轉化為行動實踐，由知識－至－行動循環 (Graham et al., 2006) (圖1)；其步驟及順序涉及把研究知識轉化為臨床實踐包括兩個階段 (Curtis et al., 2016)：

1. 初始創造：知識綜合是產生新工具，如以臨床指引用以應對確立的臨床問題；這一步確保所發現的知識是應用在行動干預前的最佳的實證，同時也是實施和評價臨床實務中新知識應用的步驟。
2. 行動循環：包括 7 個階段：1) 確立的問題及相關研究；2) 在本處境中應用科研；3) 評估運用知識的障礙；4) 簡選、修整及實施干預措施；5) 監測知識運用；6) 評價效果；及 7) 維繫知識運用 (圖1)。

在臨床應用型護理照護專業來說，護理研究的目的是為臨床工作者發現更多新的及有效的方法策略，以為改善病人的照護效益。轉譯研究與現存的循證護理實踐有良好的緊密相結，為臨床工作的有效改善及提昇產生良好的效果；然而，在 EBP 中獲得知識，或從研究發現的結果或結論，學習相關干預策略應用到臨床實踐中往往耗時甚長，也是臨床護理人員最為挑戰及關鍵的優化工作技巧

(Erickson & Pappas, 2020)。為提昇護理研究發現廣泛轉化致臨床實踐中，護理基構應盡實際努力，護理領導者及行政者支持護理研究者發展護理科研，將理論知識轉化成最佳的臨床實踐，並驗證應用這些最佳實踐或介入措施帶來更理想的臨床果效 (胡文郁等, 2020)。

3.2 確認及評價臨床護理效果

評價護理科研干預的效果，是衡量介入措施達到預期目標或假設的程度及其影響因素；介入措施的有效程度、目的及綜合因素影響會決定最後結果，結果的產生從病人層面可能帶來身體生理、心理、社會及靈性的全人關懷的其中某些效果的呈現；從服務質量層面，在機構對服務的結構性投入 (Structure) - 過程表現 (Process) - 對病人照顧或專業貢獻上的效果 (Outcome) 作全面及宏觀評價 (Donabedian, 1988；NHS, National Health Service, 2022)。無論評價的考量點如何組成，皆需要呼應研究計劃時所引用的理論框架，並對應理論的各個部份，結合實際測量結果加以討論分析。

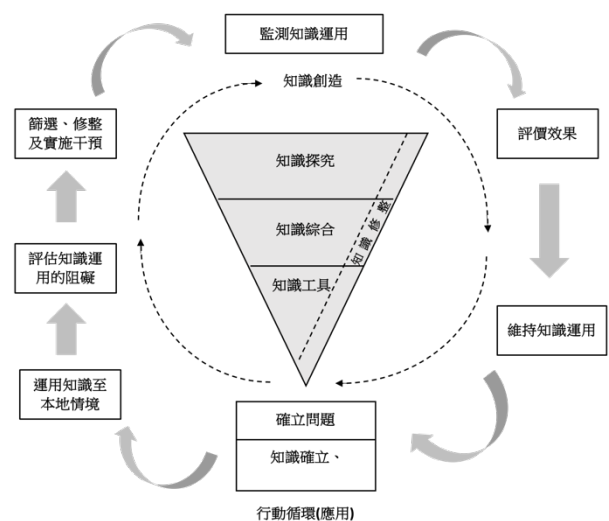


圖 1 從知識探索到行動應用的過程 (Graham et al., 2006)

4 聯合 EBP 及護理科研成果，落實臨床應用

在臨床推動循證實踐的概念時，針對干預措施的應用對臨床實況、組織管理、領導策略及病人對照護質量的改變等，皆需要客觀瞭解其影響因素，才能定下結論及執行方案；因此，在建構驗證實證依據、研究結果應用到臨床情境、或落實實證結果在臨床應用，整體實施過程的思維是一個多系統層次，與「基礎理論－研究驗證－臨床實踐」環環相

扣的相動過程（穆佩芬，2013；Weiss et al., 2018）

（圖 2）。此外，實踐過程中應控制非預期不良事件發生，盡可能減少不必要的實務工作成本，藉以保障臨床安全及成本效益的充分發揮（胡文郁等，2020）。機構應在科研循證上建立氛圍及文化，支持質量改進、實務自主、臨床威信及提升病人照顧使命；推動護理最佳實踐源於 EBP 與護理科研的結合 - 轉譯 - 實踐應用，並有賴更好的：人員分配、工作環境、護理照護質量、病人效益及照護開支及資源使用（Erickson & Pappas, 2020）。

5 總結

以「病人為本」是護理的核心價值，透過文獻回顧、EBP 及護理科研成果的轉化，運用專業領域知識，建構實證照護框架，以醫院為基礎研究的轉化平台，運用轉譯性介入干預科學的方法，能加強相關護理照護的示範作用；EBP 干預措施的介入及研究的過程，能促進有示範作用的護理照護知識長進，也有助內化相關改進及取得最佳的臨床成效；研究結果有助指導更廣闊的創新實踐、提供高質量的護理照護措施、培養更好的臨床實務並改善臨床效益。

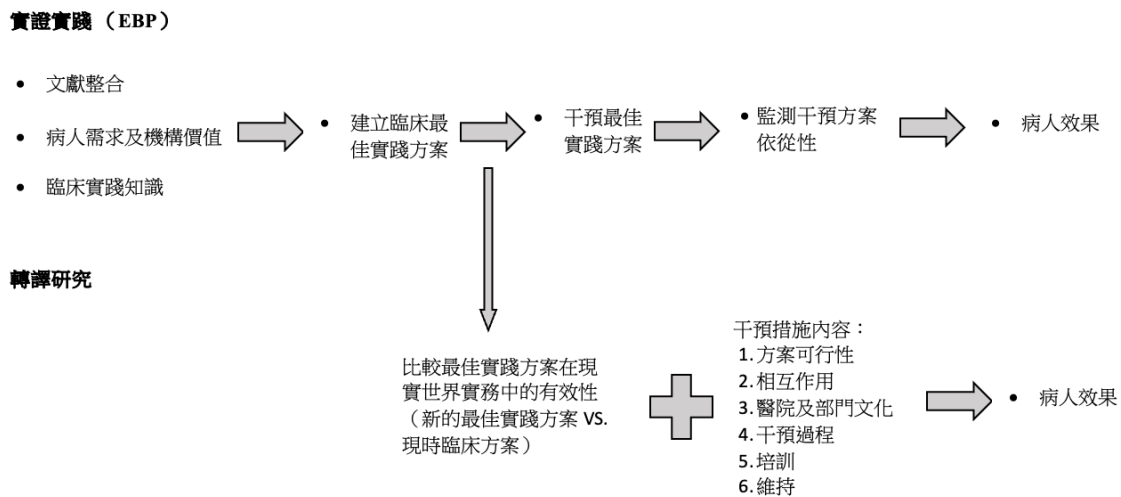


圖 2 EBP 與轉譯研究的關係 (Weiss et al., 2018)

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淺談澳門專科護理發展的現況與展望

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【摘要】 踏入醫療護理技術日新月異的年代，專科護理逐漸成為護理學科發展的主要方向。在臨床護理實踐中，專科護士進行高級健康評估，為醫療和護理措施的制訂提供正確的依據，解決臨床疑難問題，亦不斷提高護理專業質量水平。本文通過專科護士在澳門的發展進行簡述，結合個人作為早期專科護士的成長經歷，探討專科護士在臨床工作、創新科研、教育及培養人才和多團隊合作等專科護理實踐中的作用，以及對本地專科護理的發展提出展望。

【關鍵詞】 專科護士 本地發展 專科護理

Current Situation and Prospects of the Development of Specialized Nursing in Macau

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[Abstract] Entering the era of rapidly changing age of healthcare and medical technology, specialist nursing has gradually become the main direction of the development of nursing disciplines. In clinical nursing practice, specialist nurses perform advanced health assessments, provide the right basis for developing medical and nursing measures, solve the clinical problem, and continue to improve the quality of nursing care. This article introduces briefly the development of specialist nurses in Macau, incorporating personal experience growing up as an early specialist nurse, explores the clinical work of specialist nurses, brings out innovative scientific research and education, and participates in multi-disciplinary team work. Lastly, attempts to prospect the development of local specialist nursing.

[Key Words] clinical nurse specialist local development specialty nursing

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1 專科護士發展與本澳現況

1.1 專科護士發展

專科護士一詞最早在美國被提出 (Clinical Nurse Specialist, CNS)，是指在某一特殊或者專門的護理領域具有較高水準和專長的專家型臨床護士，並且向患者直接提供高質量護理服務的護士 (Canadian Nurses Association, 2008)。美國從 1954 年開始培養專科護士，加拿大、英國地區等各國是在二十世紀六十年代開始專科護士制度，並進行相關專科教育課程 (吳育茵, 2014)。在香港地區於 1995 年開始發展專科護士，並於 2001 年 5 月制訂並頒佈了專門針對專科護士的工作標準及相應工作職責 (高琪, 2009)。中國內地最早開始培養專科護士是 2001 年初，當時中山大學創辦了造口治療師學校，是內地第一個規範培養專科護士的辦學機構 (尤黎明, 2006)。2002 年開始中華護士學會與香港危重症護士協會合作舉辦培訓班，隨後，全國各地專科護士快速發展 (成守珍, 2021)。在臺灣地區，2003 年長庚大學護理系提供專科護理師碩士層級高等教育，而護理人員的層級分為基礎護理人員及進階護理人員。2009 年，進階護理人員正式被命名為「專科護理師 (Nurse Practitioner, NP)」(唐婉如, 2009)。

1.2 澳門專科護士發展

在八十年代，澳葡時期政府為明確護士的專業特性及能力認同，通過規範學習和考核後，給予長期在特別部門或專項領域的護士應有的專業資格。1990 年由澳門衛生司技術學校負責邀請葡萄牙資深導師來澳門培訓本地專科護士，除公共 (社區) 護理，其它專科課程包括婦產科護理、兒科護理、精神健康及精神病護理、內外科護理等。隨著澳門回歸後，社會穩定，經濟改善，社會民眾健康意識不斷提高，對醫療專業發展的需求擴大，護理更趨專門化及科學化，澳門特區政府亦致力培養高素質的護理人才。2006 年由香港理工大學主辦，澳門理工學院 (2022 年更名為澳門理工大學) 高等衛生學校及澳門特別行政區政府衛生局協辦的「專科護理學深造文憑課程」開辦 (林愛貞、孟麗榮, 2014)。隨後 2008 年 9 月另一所本地護理學院—澳門鏡湖護理學院與香港醫院管理局合作開辦二年制「護理學專

科深造課程」，這些都標誌著澳門護理事業邁向專科發展踏出了重要的一步，並持續地為澳門培養優良的專科護士。

2 個人專科護士發展經驗分享

在過去一段較長的日子，普遍對護士的角色印象是醫生的助手。但在歐美國家中，醫生和護士是兩個不同的專業，以相輔相成的工作合作模式。本人畢業後投入了心血管科病房工作，隨著醫學快速發展，心血管內外科都朝著專門化、細分化發展 (馬凌燕, 2014)，醫療的細分化必然帶來護理工作的專門化、細分化。心血管內外科新技術、新設備層出不窮，專科護士必須要及時獲取臨床護理的最新動態 (趙雯、王曙紅, 2018)。逐於 2009 年入讀澳門鏡湖護理學院的護理學專科深造課程 (心科護理)，學習期間被安排到香港伊利沙伯醫院實習，這段時間感到自身能力和他人之差距；學習及體會到專科護士的獨立思考方式，學習心科及重症護理專有技術及儀器運用，對心臟疾病的更深理解，掌管患者的自我管理、健康促進及護理行政管理模式等，運用多專業跨團隊間合作，學會承擔專科護士的角色和責任。本人在 2011 年獲學院頒授護理學專科深造課程的證書，隨後投入於心血管病房的臨床工作中，對於如何推動專科發展，無疑成為本人職業生涯最重要的課題。隨著護理學科的發展，專科護士發揮的作用越來越重要，角色轉變為決策者、計劃者、溝通者、管理者、協調者、教育者和健康諮詢者、促進健康者、代言人、研究者、著作及權威者 (吳育茵, 2014)。借鑒鄰近地區的專科護士培養與實踐經驗，結合我院自身實際情況，開展對專科護士培養與推行的探索工作，尋求創新的服務形式，開始探索不同領域的專業位置。以下分享專科護士的推動發展的工作經驗。

2.1 臨床專科護理查房制度

臨床工作中，心科專科護士直接及間按照顧患者服務，針對複雜病例進行護理查房或個案討論，從中指導年輕護士對特殊個案的護理計劃及護理措施，以提高臨床護理實踐水準；同時亦幫助年輕護士解決臨床中存在的專科疑難問題，亦會因應發現問題查閱國內外文獻資料，制定適合本地的專科護理技術規範、技術標準、心血管介入手術臨床路徑

(如冠心病介入治療、起搏器安裝手術、結構性心臟病介入手術等)、技術標準作業程序 (Standard operation procedure, SOP) 等體現了專科護士的不斷探索和求證的價值觀及專業能力。

2.2 建立護理會診制度

建立院內護理會診制度, 有其它專科需求的病患或需要多科討論及處理, 專科護士都能承擔會診工作以及對特殊個案給予指導建議, 協助解決臨床上較複雜個案問題, 利用對疾病指引的知識及閱讀、專科技術如心臟超聲波檢查評估心臟功能, 為病患提供合適的個體化護理專科指導, 增加對治療疾病的指導建議及護理計劃, 同時促進病患的知識和增加應對病患的信心, 從而促進個案的康復和提高自我管理, 教導生活上各種技巧來應對疾病帶來的影響。

2.3 開設護理門診

我院於 2012 年設立心科護士門診, 以高血壓病為先導計劃推廣, 增加公眾對專科護士的認識。通過指導患者進行有效運動、改善飲食、舒減壓力等方法來控制血壓; 而對於新出現高血壓的患者, 更加需要指導關於高血壓的症狀、併發症、危險因素、藥物的認識、運動指導、飲食指導、教導自測血壓方法、適當心理和壓力調適。專科護士逐漸得到醫生和患者的認同, 體現到專科護士與普通護士不同的地方。2017 年與心科醫生組成團隊合作開設「房顫抗凝門診」, 重點為房顫患者提供跨專業團隊健康指導及病情專科隨訪, 團隊由心科醫生、心科專科護士、藥師組成, 專科護士為患者評估凝血指數、監測患者服藥習慣、調整藥物劑量、教導飲食及生活方式, 將患者的抗凝指標達至最理想的治療目標, 使更多患者從治療中獲益, 減少主要不良心腦血管事件的發生, 從而減少入院次數。過程中體現出專科護士具有管理複雜健康狀況病人的能力, 提高護士處理事件的獨立性。再於 2019 年, 與心科醫生共同籌備及成立「心功能不全門診」專科門診, 為心力衰竭患者提供以指引導向藥物治療及規範管理疾病, 進行疾病自我照顧管理, 出院後專科門診跟進, 專科護士應用心臟超聲波技術, 為患者評估心臟功能和射血分數 (Ejection Fraction, EF), 評估患者生活質量及對疾病管理信心和自我效能。專科

護士給予個體化的健康教育, 將患者的心功能維持在平穩的狀態, 減少因心力衰竭引起症狀的住院次數。在不斷創新服務的過程中, 專科護士需要獲取專業知識, 不斷增加技術力量, 能讓專科護士發揮其獨特的作用, 逐漸在醫療團隊中提昇地位。

至今, 我院已有 25 位具有專科資格的臨床護士, 而其中 7 位被任職為專科護士。除了心科專科外, 現增聘有圍手術期、糖尿病專科、紓緩專科的專科護士, 大家發展各專科服務, 解決臨床疑難問題, 不斷提高護理服務水平。2011 年我院成立糖尿病專科護士門診, 開展不同的慢性症篩查, 與婦產科合作關於妊娠糖尿病孕婦產前血糖管理以及與外科合作的關於糖尿病足部潰瘍慢性傷口的管理等的項目。另外, 本院的紓緩專科護士於 2013 年成立了紓緩服務小組, 恢復定期專責的家訪紓緩服務, 從而提高了家屬及病者的出院信心, 更好地體現了專科護士的專業價值。

2.4 發展創新專科護理科研能力

專科護士成長及發展中, 開展護理科研尤為重要, 不同專科就自身經歷及專業知識、技能和學術發展方向, 開展專科領域護理研究、提供臨床專科意見, 並將研究結果應用於專業領域, 發揮自己在該領域的學術或技術上指導作用。護理科研是專科護士核心能力之一, 也是一種護理走向專科發展的體現。本院專科護士曾參與數項由澳門科學技術發展基金會資助的科研項目, 其中由護士主導的項目為「智能電話應用程式於經皮冠狀動脈介入術後病人的心臟康復計劃」。由心臟科醫生、專科護士、營養師、物理治療師、心理治療師跨專業團隊的合作, 針對冠心病患者, 利用智能電話應用程式, 制作冠心病知識、介入手術方法、冠心病營養飲食、正確測量血壓、胸痛處理、有氧運動示範以及適當心理調整等的教育短片, 系統地指導心臟康復鍛煉及如何維持良好生活模式, 加強患者對冠心病預防的信心, 改善手術後生活模式, 並提醒定時測量及記錄血壓, 體重等指標, 專科護士透過後台數據, 針對患者不同狀況進行個體化指導。結果顯示, 參與者在三個月後的 6 分鐘步行測試、自我效能評估, 血脂及血糖測量的改善優於對照組, 效果顯著, 患者及家人對整個康復計劃及專科服務感到滿意

(Lau et al., 2023)。通過實證科研的方法有助探討手機應用程式運用到慢性病管理方法，推動護理專科質量改善計劃。運用 Plan-Do-Study-Act (PDSA) 為操作框架，引用循證，落實有效的護理措施，計劃及參與改善方案，通過查閱文獻，設計科研及討論，實行對照分組比較，可以將成果運用在實際工作中。

2.5 強化專科護理教學

專科護士不僅是臨床護理的實踐人，同時必須作為提升醫院整體專科護理水準的重要師資力量，協助及制訂相關專科護士臨床培訓管理制度，培訓基地的管理，教學基地的建設，制訂臨床培訓相關管理制度，以及考核制度等；定期對新護士、培訓護士進行專科知識和技術操作的培訓，部份專科如糖尿病、感染控制護士還需要不定期對全院護士進行培訓。另外，承擔本地護理學院專科護理課程的講師及臨床帶導師等，負責護士學生、年輕護士、進修護士等教學工作。根據臨床需要及新指引的推行，進行全院範圍內的專科培訓，方式以教學查房、專科討論會議或專題研習工作坊等為主導，推廣專科護理新理念、新方法。

3 澳門專科護理的發展展望

3.1 培養及制度化專科護士

培養專科護士隊伍也成為許多地方臨床護理實踐的發展策略和方向。就專科護士培養和實踐建議，由於目前本澳地區專科護士培養和與鄰近地區臨床護理發展需要均存在一定差距，因此需要根據現時臨床護理發展，需要並借鑒經驗，探索符合適應本地護理發展需要。根據澳門行政法規《醫學及護理專科》，將以下為澳門認可之護理專科，分為十三個護理專科，包括有：重急症護理、癌症護理、紓緩護士、心科護理、外科護理、康復護理、內科護理、婦產科護理、兒科及新生兒護理、心理及精神護理、老年護理、社區衛生護理、感染控制護理（澳門特別行政區印務局，2021）。有些專科領域屬於起步階段，各高等學院相繼舉辦不同專科的課程，培養能滿足臨床護理需求的專科護士，構建專科人才培養梯隊。現時本澳專科護士集中以社區護理、婦產科、及老年為主，對未來澳門可持續開展

關於外科（如慢性傷口專科、造口專科）、兒科及新生兒科、康復護理等。並可按需求建立專科門診類型，如開展傷口專科護士門診，圍手術期專科護士門診等。

3.2 規範專科護士職能範疇

「沒有明確的工作角色定位」被認為是影響專科護士發展的主要因素（甘玉雲等，2016），應進行規範不同領域專科護士的職能範疇，如在美國專科護士依法授予開立處方權力，需擔任疾病預防及管理工作，服務包括：針對診斷後的治療所開的醫囑、執行醫囑、監督醫囑之執行與解釋醫囑等活動（楊淑華，2016）。在新加坡，部分特殊的放化療特殊藥物僅有專科護士有權力給藥（樊曉琪、劉娟，2019）。2007 年，臺灣相關部門制定了專科護士的執業範圍，主要有以下幾個方面：除了常規的臨床護理工作，主要從事經臺灣衛生主管機關認定的由專科護理師執行的醫療輔助行為（臺灣衛生福利部，2016）。本文建議將來規範專科護士的職能範疇，如按指引或臨床路徑，開立一般血液學和診斷學檢查，給予一定範圍內的藥物處方權，並可按指引調整藥物劑量，向患者解釋報告及其意義、專科方法相關操作等。澳門可參考毗鄰地區相關法案及執行情況，訂立各領域專科護士的職能範疇，增加專科護士對前景方向清晰度，推進專科護士的能力發揮，增加專業認同感，吸引及挽留更多年輕護士投身專科護士的行列。

3.3 強化本地專業認證及執業資格

2020 年，世界衛生組織提出，在當前形勢下，公共衛生事業面臨著巨大挑戰，以及步入人口老齡化的趨勢，突顯出護理隊伍不可替代的作用，以及承擔著非常重要的角色，對護理專業化水平的要求也越來越高（World Health Organization, 2020）。因此，建立和發展專科護士制度，提高護理專業技術水平是促進護理專業發展的重要策略（黃娟，2014）。2021 年，澳門特區政府衛生局成立護士專科委員會，標誌著澳門護理專科發展進入一個嶄新的里程碑。該委員會負責護理專業培訓和專科護士資格認可，以及組織、統籌和監督護理專科培訓（澳門護理專科委員會，2022）。未來，通過不斷努力，希望爭取成立「澳門護理專科學院」，下設

分科學院，屆時將會具備監測、評審及發展護理專科資格、規範專科護理課程標準、檢定及頒授專科護士、院士及名譽院士資格等功能，促進各專科護理水準的提高，逐步制定各專科護士具體職能和對應的薪酬福利，促進不同護理學科發展。

4 展望

中國澳門地區作為著名的國際旅遊及娛樂城市，增加了經濟繁榮的同時也帶來不少問題，如生活壓力、慢性疾病以及人口老齡化等情況。現今網絡高速發展、新冠疫情後公共衛生狀態改變以及人口老齡化速度加劇，專科護理發展應涵蓋著危急救治、感染控制、慢性病管理與康復、家居長期照護以及臨終關懷等。而澳門屬於地少但人口密度高的地區之一，截至 2023 年 6 月，澳門共有一所公立綜合性醫院、一所公立康復醫院（包括仁伯爵綜合醫院和九澳康復醫院）及三所私立醫院（包括鏡湖醫院、科大醫院及銀葵醫院），並有一所正在興建的離島醫療綜合體（北京協和醫院澳門醫學中心）（澳門特別行政區政府新聞局，2023），每所醫院對專科護士的發展路徑不一致，也有礙於專科護士的發展。目前本澳護理邁向專科發展屬萌芽階段，「澳門護理專科委員會」成立時間不長，現階段正訂立認證制度及管理辦法。作為專科護士一員，要以此為契機，充分履行專科護士的責任和義務，加強專科護士在地區性的認同，加強在醫院與社區專科護理服務的銜接，促進健康、預防疾病，以滿足現時澳門市民多元化、多層次的健康需求，強化和轉化專科護士的角色。未來，充分運用網絡及持續學習，利用電子健康記錄、遠程監測、人工智能等技術，輔助臨床判斷、數據分析、教育培訓等工作，不斷增加知識及技術力量，令各科的專科護士走向更燦爛的道路。

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健康教育 Health Education

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一個為促進外地家務工作者健康素養的教育影片： 從設計到製成

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【摘要】城市化的急速發展使遷移人口不斷增長，據國際勞工組織估計，目前全球的移工人口約 1.64 億，大部分都向著高收入國家流動。他們的生活條件增加了健康的脆弱性，特別是語言和文化差異、不足的社會保障等。隨著全球化人口流動，移工成為了影響個人和人口健康的全球性現象，就此世界衛生組織提出除了制定健康的公共政策，亦需關注移工健康素養，指出健康素養與健康狀況、醫療依從性、預防疾病等相關；並建議投入資源，透過教育、健康推廣活動及資訊科技等方式倡導健康素養。本文透過文獻回顧及團隊過去的研究基礎，展述為澳門外地家務工作者製作促進健康素養預錄影片的概念和歷程。

【關鍵詞】 外地家務工作者 健康素養 教育影片

Education Videos to Promote Health Literacy for Foreign Domestic Workers: From Design to Produce

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[Abstract] The rapid development of urbanization has led to a growing migrant population. According to the International Labor Organization, there are currently about 164 million migrant workers in the world, most of whom are moving to high-income countries. Their living conditions further increase health vulnerabilities, especially language and cultural differences, inadequate social protection, etc. With the globalization of population mobility, migrant workers affecting the health of individuals and populations has become a global phenomenon. In this regard, the World Health Organization proposed that in addition to the formulation of public health policies, it should also pay attention to the health literacy of migrant workers, pointing out that health literacy is related to health status, medical compliance, disease prevention, etc. It also recommends that resources be invested in promoting health literacy through education, health promotion activities, and information technology. Based on reviews of the literature and the team's past research and experience, the present paper presents the concept and process of making pre-recorded videos that promote health literacy for foreign domestic workers in Macao.

[Key Words] foreign domestic workers health literacy educational videos

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1 前言

關於健康素養的定義，各研究者間存在不同理解，而 Sørensen 等 (2012) 對健康素養的解釋獲得較廣泛的應用，他們提出健康素養與人們的文化水平息息相關，人們需要在已有的知識、動機和能力基礎上獲得、理解、評價和應用健康相關資訊，從而在日常生活中作出健康照護、疾病預防和健康促進的相關決策，並涵蓋了從個人到公共衛生層面的三級預防概念。健康素養可以進一步影響人們的健康行為、健康服務的使用、參與度和公平性，從而影響社會整體的健康結局和經濟負擔等。

在澳門的外地僱員的法律制度，有限度地容許移工在澳門工作。據統計，截至 2021 年底，澳門外地僱員人數為 17.14 萬人（澳門特別行政區政府勞工事務局，2021）。當中，家務工作者是與澳門家庭關係最緊密的工種，經常接觸兒童及長者等不同人群；澳門的外地家務工作者總人口為 2.64 萬人，他們主要來自菲律賓（1.47 萬人，57%）、越南（5517 人，21%）及印尼（3634 人，14%）（澳門特別行政區政府勞工事務局，2019）。有調查發現，澳門的非籍家務工作者的健康素養指數（Short-Form Health Literacy Instrument, HLS-SF12）為 28.4 ±8.6，低於亞洲 6 個地區，包括緬甸、越南、印尼、哈薩克、馬來西亞和臺灣（Duong et al., 2019）。此外，僅有 37.4% 的受訪者具備足夠的健康素養，與年齡及英語熟練程度有關（Cheong et al., 2021）。雖然目前缺乏關於在澳門工作的其他國籍家務工作者的健康素養狀況，然而澳門是一個華人社會，在中文及葡文為官方語言的情況下，可預期該群體可獲得可理解的健康資訊有限，進一步影響健康素養。本文將以澳門非華籍家務工作者的最大群體- 菲籍家務工作者為對象，透過文獻回顧及團隊過去的研究基礎，展述有關製作促進健康素養預錄影片的概念和歷程。

2 文獻查證

2.1 影響外地家務工作健康結果的決定因素

健康的社會決定因素（Social Determinants of Health (SDH)）是指影響健康結果的非醫學因素，包含了從人們出生、成長、工作、生活和衰老的條

件，以及具有廣泛影響力的日常生活條件和制度，例如經濟政策和制度、社會規範等（World Health Organization [WHO], 2009）。國際移民組織（International Organization for Migration [IOM], n.d.）提出以彩虹模型分析移工的健康社會決定因素，模型中心是個體本身影響其健康的因素，包括年齡、性別和遺傳因素，而其影響健康的程度是固定的。中心向周圍延申四層，包括個人生活因素（即以促進或危害健康的個人生活方式）、社會和社區的網絡（社區成員的相互支持，包括家庭和社交圈子）、生活和工作條件（維持健康的能力是取決於生活和工作條件、即食物供應、基本用品及服務的獲得）、社會經濟、文化和環境條件（即影響整個社會普遍人口健康的因素，例如城市化、文化價值、重大社會事件等）（Dahlgren & Whitehead, 2006）。外地家務工作者面臨著社會、文化、經濟等各種障礙，促使他們的健康受到不同程度的威脅，移居及其帶來對生活和工作的改變，已成為重要的健康社會決定因素。澳門的外地家務工作者，不但需要適應文化及語言的差異，且面對著不同的生活及工作環境，有報導指出，該群體的健康社會決定因素欠佳，主要包括較低下的生活及就業條件（如工作時間長，工資低），語言受限及缺乏社會支持（張栢菱等，2020）。這些不令人滿意的健康社會決定因素同樣也影響著世界各地的家務工作者，進一步影響他們的健康結果（International Labor Organization [ILO], 2013）。

2.2 為澳門外地家務工作者設計促進健康素養的計劃

健康素養的普及是促進遷移人口和社會發展以改善健康的一個重要概念，以保持良好的健康和福祉，這不但是健康促進的策略，更是減少衛生不平等現象的有效途徑，以確保所有人口都能使用衛生系統（WHO, 2018）。有關針對遷移人口的健康促進，各國根據遷移人口的背景特徵設計計劃，推動健康公共策略、創造支持性環境、加強社區行動、發展個人技能及重整衛生系統（WHO, 2018）。在多元文化的社會背景下，語言及文化差異成為了健康促進計劃的最大挑戰，預錄影片作為教育干預被報導是個可取的方法（O'Mara et al., 2010; Chavez et

al., 2004)；有學者指出預錄影片是健康知識傳遞工具，主要用於線上教育課程，以補充甚至取代傳統培訓 (Hébert et al., 2020)；針對外籍人士的教育，研究表明，無論他們的年齡、教育水準、工作條件如何，基於互聯網的線上教育是一種有效的教學方法 (Gegenfurtner & Ebner, 2019; Lee & Lee, 2015)。Hall 等 (2018) 的研究發現，在澳門的大多數菲律賓家務工作者擁有智慧手機，並能訪問互聯網。鑒於線上傳播健康知識的靈活性和有效性，預錄影片有利於解決語言的障礙，透過互聯網的傳播，不受到時間及地點的限制，非常切合普遍家務工作者的特殊背景。

有學者提出，有關以社區健康為基礎的影片製作，需關注五個研究及實踐的重要建議：(1) 將社區成員、健康工作者及和藝術家聚集在一起，參與到影片的各製作階段，以利各方之間的互動；(2) 使用敘事和講故事的技巧來說明確健康問題，以利更好參與到社區中；(3) 創作過程中，使用參與者偏好的語言、文化及溝通方式；(4) 把影響健康的社會環境條件滲入；(5) 利用製作成為參與者的重要變革的過程，以推動其在社區內的聯繫 (Chavez et al., 2004)。資源的投入、有關的知情同意、建立跨文化協作、一起寫劇本及通過編輯和音樂選擇，將製作合適該群體的所有元素結合起來 (Chavez et al., 2004)。預錄影片製作的過程也可以成為參與者的關鍵變革，有學者認為，健康促進影片製作的前期和後期規劃，讓遷移人口參與其中，可為遷移人口及其社區賦能 (Empower) (Chiu, 2009; O'Mara, 2013)。

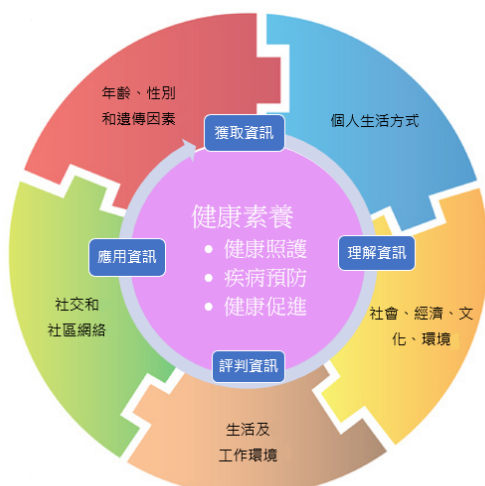


圖 1 促進健康素養計劃概念框架

因此，為提升外地家務工作者的健康素養，本文以 Sørensen 等 (2012) 的健康素養模型為框架，結合影響健康的社會決定因素，設計出促進健康素養計劃的概念框架 (詳見圖 1)，框架作為預錄影片主題及內容的指導依據。

3 促進健康素養影片的製作歷程

綜合以上資料可見，針對遷移人口的健康素養促進，需重視參與者的語言、文化及充分參與，運用賦能概念，以更有利健康素養的推廣。有學者提出，具有文化調適特質的健康促進包括社區過程的投入、多元文化提供者、種族協調者、健康工作者、翻譯材料、口譯員、多語種錄影和文化能力培訓 (Chiu, 2009)。是次研究及製作獲得澳門支援外地家務工作者的非政府組織及菲籍家務工作者團體的支持，影片製作團隊成員包括護理人員、社會工作者、翻譯員 (精通中、英、菲語)、菲籍家務工作者及具拍攝多語錄影經驗的專業拍攝人員等，影片的口語及字幕均為菲律賓語，製作過程亦以菲律賓語互動。以下將簡介製作歷程的三個階段。

3.1 發展故事劇本

研究團隊基於上述促進健康素養計劃概念框架，綜合過去的研究結果 (張栢菱等, 2020; Cheong et al., 2021)，草擬了六個教學主題，分為健康照護、疾病預防、健康促進、傳染病預防、社區支持和生活衛生六個主題；並邀請了服務該群體的社會工作者及菲籍家務工作者組織，共同參與構建具體主體內容，如社會工作者提出服務個案最不常了解有關職安健、醫療保險等健康資訊；菲籍家務工作者組織反映成員常遇到的健康問題，包括疾病訊息、就診費用等。根據團隊的討論共同創建六個主題的具體教學內容，詳細可見表 1。當中，由於澳門不少健康資訊、衛生服務及社區服務等沒有提供英語或菲語的資料，故在選材及撰稿過程中，需投入更多時間進行溝通及說明。

表 1 健康素養促進計劃的教學主題內容

主題	內容	結合外地家務工作者的特殊背景
1. 健康照護	<ul style="list-style-type: none"> - 醫療服務（緊急和非緊急） - 醫療保險 - 精神健康熱線 	外地家務工作者接受醫療服務受到個人經濟、語言文化等限制。有研究指出，澳門菲籍家務工作者面對著不同的精神健康問題和成癮行為（Hall, Garabiles, & Latkin, 2019）。
2. 疾病預防	<ul style="list-style-type: none"> - 疫苗接種 - 自我檢查 - 尋求醫療建議 	有關疫苗的需要，是澳門菲籍家務工作感到最困難應對的（Cheong et al., 2021），加上對疾病的認識不足，對於身體的問題未必能及時發現及跟進。
3. 健康促進	<ul style="list-style-type: none"> - 體能活動 - 均衡飲食 - 職業安全 - 休閒和體育設施 	關於健康生活型態及職業安全，家務工作者需要有充分的認知，才能選擇最適合自己生活及工作條件的方式維護健康。向該群體深度介紹移居地的各種市政服務，例如休閒和體育設施等，有助他們融入當地的生活，以利獲得更好的健康條件（Careja & Jönsson, 2016）。
4. 傳染病預防	<ul style="list-style-type: none"> - 接觸傳播及注意事項 - 飛沫傳播及預防措施 - 空氣傳播及注意事項 - 病媒傳播和預防措施 	人口的流動對傳染性疾病的傳播帶來威脅（Castelli & Sulis, 2017），澳門是一個國際旅遊城市，有必要讓家務工作者認識常見傳染病的有關知識。
5. 社區支持	<ul style="list-style-type: none"> - 澳門非牟利機構 - 菲律賓駐澳門總領事館 	缺乏社會支持，是菲籍家務工作者在澳門普遍經歷的壓力來源（Hall, Garabiles, & Latkin, 2019），澳門有關的組織雖然不多，但對該群體的社區支援起相當的作用。
6. 生活衛生	<ul style="list-style-type: none"> - 垃圾處理 - 食物安全 - 環境衛生 	大多移工從低收入地區向高收入地區遷移（ILO, 2018）；生活環境的改變，加上較低的經濟及住宿條件為健康帶來負面的影響（張栢菱等, 2020），有需要提升家務工作者對個人生活衛生的關注。

3.2 場景、道具及主持人的準備

劇本以資訊為主，配以情景及動畫來突出重點，為了把菲籍家務工作者的文化及環境條件滲入當中（Chavez et al., 2004），影片的場景都以該群體工作及澳門社區生活範圍作考慮，如家居的客廳、廚房，以及公共社區設施，包括醫療衛生、社會福利與保障、休閒和體育設施等。場景配以相關的道具，如清潔用品、醫療用品及手機應用程式頁面。影片亦邀請了 10 位菲籍家務工作者以第一身角度擔任主持拍攝，雖然菲語是菲籍家務工作者的母語，然而，不同省份及不同年代，其用字會有不同，在正式拍攝前由翻譯員協调用字，拍攝團隊指導主持技巧，透過反覆練習及彩排，調整表達方式，以最直接切合受眾的語言及文傳遞有關資訊。

3.3 拍攝及後期製作

研究顯示，賦權對於健康素養、健康的社會決定因素、個人和群體對健康的看法以及健康需求至關重要（Cron Dahl & Eklund Karlsson, 2016）。在拍攝及後期製作的過程中，受邀的 10 位菲籍家務工作者賦權參與，並由拍攝公司及研究團隊協作菲籍家務工作者；在過程中對拍攝內容的設計、理解、熟識、呈現，涉及到對有關內容的不斷互動、澄清及確認，這種對於健康資訊的溝通不單有利於滿足參與者的需要，同時增加了參與者對獲取醫療保健的理解和信心（Al-Adhami et al., 2021; O'Mara, 2013）。菲籍家務工作者在後期製作中，主要擔當審視有關影片剪接後的內容、動畫及文字的適切性，目前所完成製作的六段影片成果已在 YouTube 發佈，在平台輸入「Health Literacy Improvement Project, KWNC」可搜尋到有關影片。

4 總結

移工是全球人口遷移現象下的其中一類群體，他們隨遷移目的地工作，環境的變化，健康受著不同程度的影響，也成為全球公共衛生關注的重點之一（WHO，2010）。澳門在輸入外地勞工的政策下，有接近一半的勞動人口為外地僱員（澳門特別行政區政府勞工事務局，2021）。當中與澳門的家庭最緊密的工種就是家務工作者，受限於語言及文化差異，該群體獲得、理解、判斷及使用健康資訊的能力，即健康素養較低。優化他們的健康素養是公共衛生的一項重要舉措，以實現「人人享有健康」的權利。本文透過文獻回顧及團隊過去的研究基礎，以 Sorensen 等（2012）的健康素養模型為框架，結合影響健康的社會決定因素及外地家務工作者的特殊背景，設計出六個促進健康素養影片的主題及內容，並展述影片的製作歷程，包括實現賦能，重視參與者的語言、文化及充分參與。預錄影片有利於解決語言的障礙，透過互聯網作為傳播媒體，預錄影片不受到時間及地點的限制，切合普遍家務工作者的特殊背景。然而，線上傳播是一種相對單向的傳遞方法，建議可增加互動或結合線下的方式；並進一步探索預錄影片對外地家務工作者健康素養的成效，以利提升外地家務工作者的健康素養。

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個案護理 Nursing Case Study

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承百載春風化雨
傳鏡湖仁愛關懷運用音樂治療一例極低體重早產兒併發壞死性腸炎之
護理經驗詹雅雯^{1*} 葉玉華²

【摘要】 本文旨運用音樂療法介入照顧一位 24⁺¹ 週極低體重早產兒併發壞死性腸炎之護理經驗，護理期間自 2020 年 2 月 5 日至 6 月 2 日，筆者採系統性評估，以生理、行為與家庭評估為主，透過直接護理、觀察、身體評估、與案父母會談等方式收集資料，確立護理問題有：「低效性呼吸型態」、「皮膚完整性受損」、「營養失衡：少於身體所需」以及「潛在危險性依附關係障礙」。照護期間運用音樂治療技巧，以穩定個案的生命徵象、緩解生理上不適感及促進成長，並鼓勵父母共同參與照護，教導父母腸造口照護技巧，如何自製早產兒造口袋，進而建立親子依附關係，並提供父母多項早產兒及腸造口等居家照護相關資訊，以減輕父母的焦慮情緒，增強照護信心。

【關鍵詞】 極低體重早產兒 壞死性腸炎 音樂治療

Music Therapy in the Care of Extremely Low Birth Weight Preterm
Infant with Necrotizing Enterocolitis: A Nursing ExperienceYa Wen Chan^{1*} Yu Hua Yeh²

[Abstract] This study presents a nursing experience involving the application of music therapy to care for a 24-week and 1-day extremely low birth weight preterm infant with concurrent necrotizing enterocolitis. The nursing period for this case extended from February 5, 2020, to June 2, 2020. The author conducted a systematic assessment, primarily focusing on physiological, behavioral, and family evaluations, and collected data through direct nursing care, observations, physical assessments, and discussions with the parents. The identified nursing issues during this period were: "inefficient respiratory patterns," "compromised skin integrity," "imbalance in nutrition: inadequate intake compared to body requirements," and "potential risk of attachment relationship disorder." Music therapy techniques were employed during the care period to stabilize the patient's vital signs, alleviate physiological discomfort, and promote growth. The involvement of the parents in shared care was encouraged through teaching them colostomy care skills and the creation of a premature infant colostomy bag to foster parent-child attachment. Additionally, comprehensive information regarding the home care of premature infants with colostomies was provided to the parents to alleviate anxiety and enhance their caregiving confidence.

[Key Words] extremely low birth weight preterm necrotizing enterocolitis music therapy

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1 前言

壞死性腸炎 (Necrotizing enterocolitis, NEC) 是早產兒最嚴重的腸胃道急症，在歐美國家約有 7-10% 發生率，而台灣有 2-4% 發生率，九成以上為早產兒，尤其是週數越小或體重越輕越容易發生，而症狀發生常是突發性，且病情進展快速，可能在短短幾天內即會併發腹膜炎、休克、敗血症而死亡，死亡率為 10-30%，這樣高死亡率的疾病，已成為新生兒醫療團隊最不願意見到的早產兒併發症 (陳力宇等, 2019; Rose & Patel, 2018)。筆者於臨床上曾照顧過多位早產兒，但此次照顧個案除壞死性腸炎並歷經手術後照護，特別是術後個案因有留置腸造口，在照護過程中學習如何自製早產兒造口袋及黏貼技巧，並觀察到當更換造口袋時個案容易哭鬧難以安撫，讓生命徵象更加不穩定，由文獻搜尋得知音樂治療對於早產兒有多方面影響，而運用於在照護個案身上，希望能緩解個案術後引起的不適，故引發筆者選取此個案動機。同時也意識到父母在面對個案病情不穩定明顯出現焦慮不安的情緒，於每次會客時提供照護個案相關資訊，協助父母一起面對照顧個案的困難之處，鼓勵多陪伴及抱撫，增加親子間熟悉度，減輕日後獨自照護的忙亂慌張，讓父母在照顧個案上更加得心應手。

2 文獻查證

2.1 早產兒併發壞死性腸炎治療與護理

臨床上壞死性腸炎的症狀與其他敗血症相近，其中腸胃相關症狀有腹脹、糞便帶血、嘔吐及腹瀉等，治療方式主要以支持療法，先進行禁食、腸胃引流減壓、並給予營養輸液補充及抗生素等進行治療，若確定腸穿孔且壞死則需手術治療，目的為移除壞死性腸道，盡量保留腸道長度，當一旦手術介入，除切除部分壞死腸道另需在腹壁建立暫時性腸造口，以利糞便排出讓腸道休息 (王正斌, 2017)。可能出現的合併症有腸道狹窄、短腸症、經腸道造口電解質流失、營養吸收不良及腸沾黏等 (葉奕廷, 2018)。術後照護重點包含：(1) 密切監測生命徵象及尿量變化，預防其他感染；(2) 維持電解質平衡、追蹤血糖及肝腎功能變化 (林元淑、黃靜微, 2017)；(3) 清潔腸造口周圍皮膚可使用清水或生理

鹽水，以避免因排泄物長時間浸潤，導致周圍皮膚磨損，並隨時觀察腸造口大小及造口顏色是否紅潤、黏膜是否有無破損或滲血情形等 (王曉慧、邱曉彤, 2019)；(4) 腸子切除後有腸道適應問題，暫時無法由腸道給予營養，可透過全靜脈營養 (Total parenteral nutrition, TPN) 供給早產兒每日所需熱量，依台灣早產兒臨床營養建議手冊針對極低出生體重早產兒 (體重小於 1000 公克) 其熱量攝取目標 110-130kcal/kg/day，若可進食奶量增加 10-20ml/kg/day，體重增加 15gm/kg/day，身長增加 1cm/week，頭圍增加 0.9cm/week，為早產兒理想增長速度 (林永傑, 2018; Ou et al., 2020)。

2.2 音樂治療於早產兒之臨床應用

音樂是人與人之間最基本的連結，是聲音所組成的藝術表現，透過歌唱、播放及樂器演奏方式來傳達，能刺激感官協助促進生理上的發展，依據不同族群需求有不同治療目標來制定干預方式，早產兒介入重點在於掌握早產兒的節奏 (心跳)、呼吸及跟搖籃曲般的節拍，運用三大元素與早產兒互動 (賴欣怡, 2019)。然而，音樂屬非侵入性、非藥物且低成本的輔助照護方式，已逐漸受用於臨床，越來越多人也將音樂應用在早產兒身上 (Bieleninik et al., 2016)。根據文獻顯示音樂介入對早產兒有多方面影響，如：Caparros-Gonzalez 等 (2018) 及 Yue 等 (2020) 兩篇研究指出音樂介入可降低早產兒心跳速率、呼吸速率；Tang 等 (2018) 研究針對 60 位早產兒需接受中心靜脈導管置入時提供音樂治療，選擇撥放童謠或節奏慢的音樂，結果發現能有效緩解早產兒治療後的哭鬧情緒及疼痛反應；Efendi and Tane (2019) 系統回顧分析 7 篇音樂介入結果發現能幫助早產兒睡眠及促進體重增長；另外，Kobus 等 (2021) 及 Ghetti 等 (2023) 研究表示音樂介入可穩定早產兒情緒，同時亦能讓父母親心情放鬆、愉悅，增進親子間互動。

綜合以上文獻得知，音樂治療能穩定早產兒生理指標，減緩因外在壓力帶來的不安情緒及侵入性治療帶來疼痛反應，促進體重增長以及降低父母親焦慮反應，增進親子間依附關係。

2.3 早產兒壞死性腸炎病嬰父母壓力與調適護理

當父母在面對孩子非預期提早到來或治療過程

伴隨合併症產生的早產兒時，不管是否有育兒經驗，都可能造成父母的壓力，常會出現焦慮、擔心、無助感等（王曉慧、邱曉彤，2019）。文獻指出早產兒父母所面臨的壓力包含：與嬰兒分離而無法執行父母角色功能、嬰兒太小且脆弱的外表、嬰兒身上裝置許多儀器及管路、警報聲音不斷傳出、對病嬰病情發展的不確定性及治療過程不了解等都會加重父母的壓力（林元淑、黃靜微，2017；Eom & Im, 2019）。護理方面可協助父母調適技巧有：（1）會客時主動告知嬰兒成長及精神活力狀況；（2）解釋警報聲響所代表的意義；（3）鼓勵父母可觸摸病嬰或於床旁加油打氣，並讓父母共同學習照護技巧，增加親子連結，並給正向回饋；（4）主動提供早產兒病情的相關資訊、計畫及支持團體；（5）帶領父母認識早產兒不適因素並進行安撫，讓父母不會感到徬徨無助，增強父母照護信心（翁敏雪、周弘傑，2016；Rafael-Gutiérrez et al., 2020）。

3 個案簡介

3.1 基本資料

個案為男嬰，此胎 G2P2，妊娠週數：24⁺¹ 週，出生體重：650 公克，產前案母在外院規則產檢，2020 年 1 月 13 日因宮縮頻繁，故轉至醫院安胎，案母因子癲前症曾服用 Aspirin 治療，2/4 因宮縮頻繁，執行超音波檢查後，發現子宮頸短，2/5 陰道分泌物量多呈黃褐色，且子宮頸口已全開，故自然娩出一男嬰，Apgar Score：出生後第一分鐘評分為 2 分及第五分鐘評分為 4 分，因呼吸窘迫於產房放置氣管內管後轉送新生兒加護病房持續照護。

3.2 病程進展

病嬰 2/5 出生後出現呼吸喘費力，胸部 X 光呈三度呼吸窘迫症候群，放氣管內管併呼吸器使用，2/7 開始進食 1ML/Q6H，2/29 早上 10 點奶量增至 10ML/Q3H，3/1 凌晨 2 點 50 分解紅橘色糊便，腹部 X 光呈現壞死性腸炎，禁食並開始授予抗生素治療及全靜脈營養劑輸注，3/5 腹部 X 光顯示有腸穿孔，緊急床邊開腹手術，發現橫結腸及降結腸糜爛，大腸部分切除，予放置引流管並做一迴腸造口，3/10 術後第五天開始進食，奶量 2ML/Q3H，消化佳，逐日漸增加奶量，5/15 矯正週數為 38⁺² 週，體重為

2846 公克，預進行迴腸吻合術，但因大腸剩餘長度過短未能接合，並重新再建立新的腸造口，持續養大，5/20 停用全靜脈營養輸液，5/25 奶量 60ML/Q3H，體重為 3273 公克，身長為 48 公分，頭圍為 33 公分，穩定成長中，於 6/2 轉至病嬰室持續照顧。

4 護理評估

筆者於 2020 年 2 月 5 日至 6 月 2 日以系統性評估方式，透過直接護理、觀察、身體評估以及會談等方式收集個案的生理、行為反應及家庭評估的資料如下：

4.1 生理評估

4.1.1 皮膚及外觀

個案 24⁺¹ 週，出生體重 650 公克（以胎兒體重生長曲線表對應 24 週為 <3% 體重百分位），頭圍 22 公分（以胎兒頭圍生長曲線表對應 24 週為 <3% 頭圍百分位），身長 32.5 公分（以胎兒身長生長曲線表對應 24 週為 <3% 身長百分位），身體外觀呈粉紅、四肢、唇微瘀青色，脫屑、乾燥。3/5 及 5/15 術後管路有氣管內管、胃管、週邊中心靜脈輸液管路、動脈導管、左腹傷口引流管、右下腹造口，腸造口約 1.5X1.5 平方公分，外觀呈紅潤，易因解水便造成造口袋人工皮浸濕失去黏性，排泄物易外滲，刺激造口周圍皮膚發紅，4/10 造口旁約有 0.5X0.5 平方公分皮膚破且流血。顯示個案有皮膚完整性受損的健康問題。

4.1.2 氧合及循環

個案 2/5 出生，出生後因活力差、呼吸費力且喘快至 65-85 次/分、血氧飽和濃度降至 75-85%，於產房立即插入氣管內管，胸部 X 光呈現三度呼吸窘迫症候群，抽血動脈氣體分析呈呼吸性酸中毒，給過表面張力素，持續氣管內管併呼吸器使用；3/1 為進食後第 23 天突然解紅橘色便，活動力下降、血氧飽和濃度差且陸續出現心搏過緩及呼吸暫停情形，抽取血液動脈氣體分析值 pH：7.21、pCO₂：64 mmHg、pO₂：28 mmHg、BE(b)：-3.3 mmol/L，腹部 X 光顯示壞死性腸炎。心跳速率可維持 130-150 次/分，哭鬧或躁動時心跳速率為 160-200 次/分，血氧可維持 90-100%，2/12 心臟超音波顯示開放性

動脈導管已關閉。顯示個案有低效率呼吸型態的健康問題。

4.1.3 神經及感官知覺

肌肉張力及抓握反射尚可，微弱尋乳反射，與成長週數相符，3/4 及 3/9 腦部超音波檢查無特殊異常，4/14 眼科檢查為雙眼 3 度視網膜病變，於 4/15 眼內注射 Avastin 治療，5/26 雙眼皆 1 度視網膜病變，無眼內血管增生情形。

4.1.4 營養代謝

2/7-2/28 鼻胃管灌食，奶量增至 9ML 消化及解便皆正常，3/1 奶量增至 10ML/Q3H，凌晨解紅橘糊便，腹部脹大，胃管管壁上有少量黃綠色液體，開始禁食並抽血、抗生素使用，腹部 X 光呈現有壞死性腸炎，開始禁食並使用 TPN 及脂肪輸注補充營養。因確定腸穿孔，於 3/5 床邊手術切除部分大腸（橫結腸及降結腸糜爛）共約 22 公分，並建立迴腸造口引流糞便，由腸造口引流出液體及糞便多，一天總量約 80-110ml。3/5-3/9 禁食，3/9 抽血 ALB：2.5 g/dl，3/10 再次開始管灌餵食，3/12 體重：1088 公克（減少 56 公克），奶量增至 6ML/Q3H。顯示個案有營養失衡：少於身體所需的健康問題。

4.1.5 排泄、生殖

生殖器外觀無異常，尿液自解順暢，尿液呈清澈無雜質，每天平均尿量 2.5-3.2ml/kg/day，3/1-3/4 解出紅橘色糊便，量少至量中，一天約解便 3-4 次，一次約 8-15 公克，治療後 3/5 解出黃綠糊便。

4.2 行為反應

個案肌肉張力較強，偶爾出現過度伸展、手指張開及狂亂揮舞動作，對於聲音、燈光易有驚嚇反應，治療時（翻身、清潔或更換造口袋）會哭鬧厲害，在播放搖籃曲或輕音樂時，可減緩哭鬧情緒、心跳過快及呼吸急促生理反應。

4.3 家庭評估

4.3.1 家庭結構功能

家庭成員有父母親、爺爺奶奶同住，父親 26 歲、母親 28 歲，一位姐姐年齡 1 歲（家庭圖譜如圖 1），母親處理家中事務，父親從事有關環保事業，家族無特殊遺傳疾病及過敏史，經濟來源為父親，屬小康家庭，重大決策時父母會共同商討。

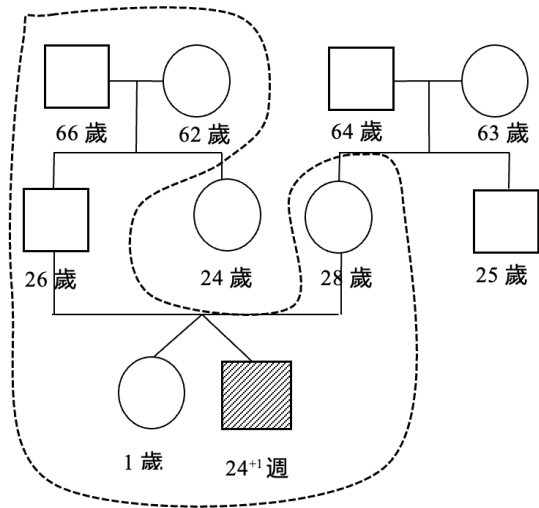


圖 1 家庭圖譜

4.3.2 家庭角色

個案為家中第二個小孩，且在期待中出生，出生後因早產立即入住加護病房，住院期間案父因工作關係，大部分探視都由案母或奶奶，積極詢問病情，如遇不克前來，也會打電話關切病情進展，平時奶奶會與案母一同照顧姐姐，但因個案出生後照顧上比較困難，因此，家庭開會決定由案母全心照顧個案，偶爾奶奶可以一同協助照顧，由全家共同分擔家中事務。案母每每入病室內探視病嬰時，情緒較顯緊張擔心，會頻繁提問問題，3/5 會客案母表情激動、顯焦慮，雙手緊握且顫抖詢問：「怎麼會越來越嚴重，早產兒都會出現這樣情形嗎？」、「他肚子放一個袋子，我需要學習照顧嗎？可是我很害怕，他是不是很不舒服？」，案母表示雖然上面已經有一個小孩，但事隔一年才生他，又遇到這麼早產我真的很擔心他現在的狀況，也不知道之後能不能負擔起照顧他責任，我壓力真的很大，案母情緒隨著病嬰狀況起伏。顯示有潛在危險性依附關係障礙的健康問題。

5 問題確立

綜合以上護理評估結果，歸納個案護理問題有四項，低效率呼吸型態、皮膚完整性受損、營養失衡：少於身體所需、潛在危險性依附關係障礙，針對上述問題，護理計畫及措施分述如下：

表 1 低效性呼吸型態/與肺部缺乏表面張力素導致肺泡塌陷及壞死性腸炎有關 (2020/2/5-5/1)

	O:
主客觀資料	1. 個案於 2/5 出生，早產 24 ⁺ 1 週，出生體重 650 公克，胸部 X 光顯示 3 度呼吸窘迫症候群且肺部浸潤，氣管內管接呼吸器使用給予表面張力素。
	2. 2/5 呼吸喘快、胸肋凹陷明顯，呼吸次數：60-61 次/分，血氧 94-99%，1430 抽吸口腔氣管內管呈至少中量透明稀黏微粉色。
	3. 2/7 開始管灌進食，3/1 奶量 10ML/Q3H，凌晨解紅橘便，給予禁食並抽血、抗生素使用，腹部 X 光呈現有壞死性腸炎的情形。
	4. 3/1 抽血追蹤血液氣體分析 pH：7.21、pCO ₂ ：64 mmHg、pO ₂ ：28 mmHg、cHCO ₃ ⁻ ：25.6 mmol/L、BE(b)：-3.3 mmol/L，WBC：10.7 K/uL、HGB：11.4 g/dL、BAND.3%。
	5. 3/1 頻繁出現心搏過緩、呼吸過淺及血氧突然下降至 75-85%。
	6. 3/1 明顯精神活力下降，膚色較為蒼白，末梢冰涼，腹部微青紫色。
護理目標	1. 3/22 呼吸器使用期間，血氧濃度可維持 90% 以上，呼吸速率維持 30-60 次/分，配合呼吸器施打，無胸肋凹陷情形。
	2. 4/30 可移除氣管內管後，出現呼吸暫停或心搏過緩少於 2 次且動脈氣體分析報告值改善。
	3. 4/30 呼吸平順，無使用輔助肌，皮膚粉潤。
護理措施	1. 心電圖 24 小時監測心跳、呼吸及血氧變化，並記錄上傳數據。
	2. 每班或視情況確認氣管內管固定位置並聽診呼吸音變化。
	3. 隨時排空呼吸器管路積水，以維持呼吸器正常運作。
	4. 協助每 2 小時採左右側 3/4 俯臥，身體頭、頸及脊椎呈一直線姿勢，肢體靠近身體中心，保持屈曲姿勢，以利於氧合。
	5. 治療時或個案哭鬧時播放輕音樂或有節奏性音律，以安撫情緒，避免持續哭鬧用力，減少耗氧。
	6. 3/23 協助醫師移除氣管內管，採鼻式持續性正壓呼吸輔助器(NCPAP)使用，維持鼻部管路通暢，勿扭折。
	7. 4/25 協助醫師移除鼻式持續性正壓呼吸輔助器，氧氣鼻導管 0.5L/MIN 使用，注意呼吸及心跳速率，並有紀錄。
	8. 視情況協助醫師追蹤動脈血液氣體分析數值，以做為調整氧氣參考依據。
	9. 隨時觀察呼吸型態、是否使用呼吸輔助肌(鼻翼煽動、胸肋凹陷等)及膚色狀況。
護理評估	1. 2/24-3/22 使用呼吸器期間，血氧濃度介於 90-95%，呼吸速率維持 45-55 次/分，可配合呼吸器施打。
	2. 4/25-4/29 氧氣使用，偶出現 1 次呼吸淺慢，但未出現呼吸暫停及心搏過緩情形，動脈血液氣體分析數值正常。
	3. 4/29 呼吸平順，呼吸速率介於 40-52 次/分，無使用呼吸輔助肌，膚色粉潤。

表 2 皮膚完整性受損/與迴腸造口留置及反覆更換造口袋相關(2020/3/5 至轉出)

	O:
主客觀資料	1. 3/5 因橫結腸及降結腸糜爛，切除大部分大腸，留置迴腸造口，腸造口約 1.5X1.5 平方公分。
	2. 3/7-4/2 糞便多為水狀，排泄液多，一天清潔造口袋排泄物約 11-12 次，易哭鬧躁動、不定時扭動身體、毛巾與造口袋時常會摩擦。
	3. 4/10 腸造口旁約有 0.5X0.5 平方公分皮膚破損且微出血。
	4. 5/15 欲行迴腸吻合術，但剩餘大腸太短無法接合，右下腹重新留置結腸造口。
	5. 右下腹腸造口易引流出稀水便，而造成造口袋人工皮浸潤失去黏性，排泄物易外滲，刺激造口周圍皮膚發紅，人工造口袋更換約 4-6 次/天。
護理目標	1. 5/20 前自製人工造口袋能有效伏貼，造口袋更換次數減少至 2-3 次/天。
	2. 5/27 腸造口處旁破皮能癒合。
	3. 6/1 個案能較不躁動，扭動身體及磨擦造口袋情形改善。
護理措施	1. 觀察及記錄腸造口大小及造口顏色是否紅潤、黏膜是否有無破損或滲血情形。
	2. 諮詢造口護理師，提供各種尺寸造口模型，教導如何剪取早產兒造口大小且自製合宜造口袋黏貼及正確黏貼方式。
	3. 以生理食鹽水清潔造口周圍皮膚，更換造口處人工皮時可使用造口適用性噴膜(除膠噴膜及造口粉)。
	4. 造口袋內可放置軟質紗布，以吸附腸液及排泄液，減少造口處人工皮受浸潤而無法黏貼牢固。
	5. 依醫囑需要時給止瀉藥 Dioctahedral smectite，以改善排泄物性狀。
	6. 更換造口袋動作輕柔，勿過度清潔及大力撕取人工皮，防再度破損。
	7. 採集中照護，減少易產生壓力的行為，避免哭鬧躁動，減少身體扭動次數，避免摩擦。
	8. 更換照口袋前中後可撥放輕音樂或有節奏性音律，以緩解哭鬧躁動情緒。
護理評估	1. 5/18 造口袋黏貼功能佳，一天更換造袋降為 1-2 次。
	2. 5/26 腸造口處旁破皮已癒合，無滲血情形。
	3. 5/29 個案哭鬧躁動行為有改善，多可安穩熟睡 2.5-3 小時。

表 3 營養失衡：少於身體所需/與腸切除手術及迴腸造口有關 (2020/3/5-5/25)

主客觀資料	<p>O:</p> <ol style="list-style-type: none"> 3/1 凌晨 2 點解紅橘色糊便，腹脹、胃管管壁有黃綠色液體，腹部 X 光顯示壞死性腸炎，開始禁食並使用全靜脈營養液(TPN)及脂肪輸注。 3/3 矯正週數為 28 週，體重：820 公克、身長：33 公分、頭圍：22 公分，與出生比較體重、身長、頭圍生長狀況仍 <3% 百分位。 3/5 手術將橫結腸及降結腸糜爛處切除共 22 公分，並建立迴腸造口引流糞便，引流出液體及糞便量一天總量約 80-110ml。 3/9 抽血數據 HCT：28.3 %、HGB：9.6 g/dl、Albumin：2.5 g/dL、Na：130mEq/L、K：5.5 mEq/L、BUN：15mg/dL、Creatinine：0.85 mg/dL。 3/10 腹脹改善開始進食，每 3 小時灌食母乳 2ml。 5/6 矯正週數為 37 週，體重：1998 公克、身長：42.5 公分、頭圍：29 公分，成長狀況有進步，但仍未達體重 15g/kg/day，身長 1 公分/週，頭圍 0.9 公分/週的速度。 5/15 再度手術行迴腸吻合術，因大腸剩餘長度過短未能接合，重新建立新腸造口引流糞便。
護理目標	<ol style="list-style-type: none"> 4/15 反抽胃管消化佳，且能由口進食。 4/20 抽血數值 Na：133-142mEq/L、Albumin：2.8-3.6g/dL。 5/18 前能達成早產兒理想增長速度(體重為 15g/kg/day，身長為 1 公分/週，頭圍為 0.9 公分/週)，預計體重可達 2800 公克。 5/20 前達到熱量攝取目標 110-130kcal/kg/day。
護理措施	<ol style="list-style-type: none"> 每日於固定時間餐前測量體重變化，並有紀錄。 每班紀錄輸出入量變化，若有異常立即告知醫師處理。 每週測量身長及頭圍變化，並記錄在早產兒生長紀錄手冊。 每餐餵食前 5 分鐘以 ipad 撥放有節奏性音律的音樂，以緩解情緒，以促進體重增長。 3/1-4/30 使用全靜脈營養液(TPN)及脂肪輸注，醫師依據紀錄中輸注總熱量每日微調整。 3/9-3/12 依醫囑靜脈輸注 Albumin 5ml，並追蹤輸注後有無不良反應。 3/14、3/21 及 3/28 會診營養師，建議調整早產兒配方奶 0.8kcal/ml 或母乳內加入母乳添加劑提高熱量至 0.8kcal/ml。 4/10 矯正週數為 33 週，開始嘗試先由口進食早產兒配方奶，剩餘奶量由胃管灌入。 QOD 抽血追蹤電解質、肝腎功能、血液血球及白蛋白(Na、K、BUN、Creatinine、GOT、GPT、CBC、DC 及 Albumin)變化。
護理評估	<ol style="list-style-type: none"> 4/12 反抽胃管無餘奶，空氣微量，可由口進食 10ml，剩餘奶量由胃管灌入。 4/18 抽血數值 Na：134mEq/L、Albumin：3.1g/dL。 5/15 矯正週數為 38⁺²週，體重：2846 公克、身長：45 公分、頭圍：32.9 公分，可達成體重為 15g/kg/day，身長為 1 公分/週，頭圍為 0.9 公分/週。 5/15-5/19 總熱量為 121-125 kcal/kg/day。

表 4 潛在危險性依附關係障礙/角色不適應及病情不穩定有關 (2020/2/5 至轉出)

主客觀資料	<p>S:</p> <ol style="list-style-type: none"> 2/6 案母表示：「他怎麼那麼小，好可憐，身上又插那麼管子，他會不會不舒服?」 2/7 案母表示：「他看起來好小，我不太敢碰他，他會這樣都是我造成的。」 3/6 手術後探視，案父母哭泣、皺眉且顯擔憂表示：「她那麼小又早產、現在腸子又這樣，之後我們有辦法照顧嗎?」。 <p>O:</p> <ol style="list-style-type: none"> 2/5 出生 24⁺¹週早產兒，出生體重：650 公克。 2/6 身上多條侵入性管子，病嬰一扭動，警報聲會持續響並閃紅燈。 2/6-3/6 會客案母入病室內探視病嬰時，情緒較顯緊張擔心，會頻繁提問問題，對個案的哭泣感到手足無措。 2/6-3/7 會客隔著保溫箱觀看個案，不敢伸手碰觸個案。 5/16 請案母協助清潔造口，表情顯害怕、碰觸時會短暫遲疑。
護理目標	<ol style="list-style-type: none"> 4/20 前發展依附行為，如：眼對眼接觸、撫摸或抱抱個案等。 4/29 個案能對父母的聲音或擁抱給予回應。 5/18 能熟悉個案習性，床邊陪伴學習照顧。 5/23 主要照顧者能主動說出心裡感受。 5/25 主要照顧者能口頭表達對親職角色滿意。

護理措施	<ol style="list-style-type: none"> 1. 每次會客時間主動向父母自我介紹及介紹相關醫護團隊，建立其信任感。 2. 主動向父母做環境介紹，包括加護病房硬體環境、生理監視器，以減少父母親的焦慮。 3. 適時解釋早產兒的正常外觀、行為反應、知覺發展等，及與足月兒不同的地方。 4. 提供彈性會客，增加親子共處時間，並鼓勵父母親參與照顧。 5. 引導及鼓勵父母親與孩子作眼對眼接觸、對嬰兒的哭聲作反應。 6. 4/5 1100 會客撥放輕音樂一起聆聽，緩解父母親焦慮及緊張情緒。 7. 5/16 教導案母早產兒造口照護、自製造口袋、黏貼技巧及提供造口照護手冊，方便查詢。 8. 每次會客時主動給予關懷及支持，注意父母的情緒變化，提供情緒宣洩管道。 9. 每次會客探視鼓勵父母表達擔心或疑問，適時提供解答、協助處理。 10. 以同理心支持、傾聽父母心中擔憂。 11. 提供早產兒基金會支持性團體資訊，促進案母表達感覺及分享經驗。 	
	護理評估	<ol style="list-style-type: none"> 1. 4/19 案母主動表示想抱抱個案，並可抱撫 10 分鐘，個案雙眼注視案母許久。 2. 4/25 案母探視時與個案說話，個案會出現嗯嗯聲音回應。 3. 5/17 案母可正確執行造口清潔、自製及黏貼技巧。 4. 5/21 案母表示經由多次跟個案互動及學習照護可以更加了解個案情緒及習性，帶回家照顧就比較不會慌亂。 5. 5/24 案母表達跟個案相處久了發現沒有想像害怕及太難照顧，有信心照顧病嬰。

6 討論及結論

本文描述一位極低體重早產兒面臨壞死性腸炎手術切除壞死大腸及放置迴腸造口之照護經驗，筆者藉由文獻搜尋發現音樂治療對於早產兒有多方面正向影響，並將相關資訊運用於臨床照護上，透過音樂治療的護理措施介入能穩定早產兒生理指標、緩解侵入性治療帶來的壓力反應，讓個案的健康問題能得到改善。

音樂治療廣泛適用在各族群中，但使用方式不同，所呈現結果不盡相同。個案剛出生時立即面臨呼吸窘迫問題，長時間呼吸器及氧氣使用，治療時易出現煩躁不安情緒，音樂輔助介入讓個案情緒能安穩，心跳及呼吸速率趨於正常值，與 Caparros-Gonzalez 等 (2018) 研究結果相同；餵養過程發生壞死性腸炎而進行手術，留置迴腸造口引流糞便及腸液，導致皮膚破損問題，然而個案在行腸道切除手術後，影響營養素吸收，體重增長速度緩慢，除透過營養師指導及依循調配的营养治療計畫，提供音樂護理措施介入，間接緩解個案哭鬧情緒，可安穩入睡，減少腸造口處磨擦，改善早產兒睡眠及促進體重增長，與 Efendi and Tane (2019) 研究結果相近；個案也因出生時立即轉至新生兒加護病房治療，父母所面臨是無法隨時在身旁照顧及擔心病況的不穩定，每日提心吊膽，探視時鼓勵父母共同參與學習照護，除了能讓父母親能更加熟悉個案習性，提供音樂治療訊息及會客時撥放輕音樂，個案表情

舒服且安定，減緩父母親緊張情緒，增加親子間溝通及情感連結，進而增進親子依附關係，與 Kobus 等 (2021) 研究結果相近。個案在 5/15 體重來到 2846 公克可進行迴腸吻合術，雖然手術未能成功，但個案的體重、身長及頭圍已穩定成長中，個案在 6/2 轉至嬰兒病房持續照護，6/8 順利出院返家，6/11 及 6/22 電話追蹤了解居家照顧狀況，案母以開心口吻表示：「他現在非常會吃，每三小時喝 80-90ml，體重也有再增加」、「醫師說再隔一個月回醫院，預定要再手術把腸子接回去，關閉造瘻口，我很期待，希望這次能成功」。

賴欣怡 (2019) 表示可使用音樂播放方式及掌握撥放時間執行音樂治療，筆者在運用音樂治療過程僅使用撥放輕音樂或有節奏性音律的音樂，結果驗證為正向且安全，但仍有許多護理措施介入會影響結果，需考量更多干擾因素，建議醫院提供有受過專業訓練的音樂治療師主導執行，醫師及護理師協助，提供更完善的早產兒音樂治療。回顧整個照護過程中筆者雖然已照顧多位早產兒，但當再度面對極度早產兒仍備感壓力，深怕小小身軀一碰觸會導致更加不穩定，照顧上需更加小心謹慎，以新生兒個別化發展性照護為基礎，藉由將音樂導入早產兒護理照護，以精緻及整體性的呵護小腳丫—早產兒，是早產兒照護的目標，雖然音樂導入過程未臻完善，但卻提供臨床上一項早產兒照護措施技巧，希望藉此照護經驗分享。

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傳鏡湖仁愛關懷

The Association Between Frailty Status and Different Aspects of Well-Being of Older Adults in Macao: A Community-Based Survey

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[Abstract] Background: Frailty is considered an age-related condition, which can lead to unsatisfactory health outcomes. While many factors contribute to frailty, there is a lack of evidence on which aspect of related factors contribute the most in frailty. The purpose of the present study was to understand the current frailty status of older adults in Macao, and to investigate the association between different aspects of well-being (including physical, psychological, social, cognitive and self-rated health (SRH) and the age difference in frailty. Method: A cross-sectional survey was conducted in a community. Frailty was assessed using the Fatigue, Resistance, Ambulation, Illness, Loss of Weight (FRAIL) scale. Physical, psychological, social, and cognitive well-being were assessed through different tools and questions. Logistic regression models were used to analyze the association of different aspects of well-being with frailty status. Results: Among 572 valid responses, the mean age was 74.6 (range from 65 to 94), 23.77% were in pre-frail/frail status. In models only adjusted for sociodemographic factors, participants with higher PHQ-2 scores (aOR=11.09, $p<0.001$) and poor SRH (aOR=4.36, $p<0.001$) had a significantly higher risk of being in pre-frail/frail status. The results remained after adjusting all aspects of well-being. The effect of psychological well-being on pre-frail/frail was significant higher in the older age group (aOR=20.98, $p<0.001$) than in the younger age group (aOR=8.90, $p<0.001$). The effect of SRH was higher in the younger age group (aOR=5.71, $p<0.001$) than in the older age group (aOR=3.58, $p=0.01$). Conclusions: Older adults in Macao with poor psychological well-being and SRH have higher risk of being frail. Intervention that targets psychological well-being might be an effective way to prevent frailty among older adults in Macao. This finding also encourages public health policy targeting psychological well-being improvement.

[Key Words] frailty psychological well-being self-rated health older adults Macao

澳門老年人衰弱狀態與不同面向的幸福之感之關係：一個社區研究

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【摘要】 衰弱被視為一種與年齡相關的疾病，可能導致不良的健康結果。本研究的目的是了解澳門長者現時的衰弱狀況，並探討不同幸福感面向（包括身體、心理、社交、認知及自評健康）與衰弱的關係，以及其中的年齡差異。本研究為使用 FRAIL 量表評估社區長者衰弱程度的橫斷面調查。透過不同的工具和問題來評估身體、心理、社交和認知健康。使用邏輯斯迴歸模型分析幸福感的不同面向與虛弱狀態的關聯。在 572 份有效問卷中，參與者的平均年齡為 74.6 歲（65 歲至 94 歲），23.77% 處於衰弱前期 / 衰弱狀態。在只調整社會人口學因素的模型中，PHQ-2 得分較高（aOR=11.09, $p<0.001$ ）和自評健康較差（aOR=4.36, $p<0.001$ ）的參與者處於衰弱前期 / 衰弱狀態的風險顯著較高。在調整各面向的幸福感後，此結果仍然存在。心理健康對衰弱前期 / 衰弱的影響在老年組（aOR=20.98, $p<0.001$ ）顯著高於年輕組（aOR=8.90, $p<0.001$ ）。自評健康在年輕組的效果（aOR=5.71, $p<0.001$ ）高於老年組（aOR=3.58, $p=0.01$ ）。心理健康狀況和自評健康較差的澳門老年人的衰弱風險較高。針對心理健康的介入是預防澳門長者衰弱的有效方法。這項發現也鼓勵針對改善心理健康的公共衛生政策。

【關鍵詞】 衰弱 心理健康 自評健康 老年人 澳門

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1 Background

Frailty has been long discussed in clinical and academic settings (Clegg et al., 2013; Rockwood, 2005; Van Kan et al., 2008). However, international societies had not reached a consensus on the operational definition of frailty until 2012, which indicated that physical frailty is a medical syndrome and called for attention from different fields (Morley et al., 2013). Frailty has been considered as the result of age-related physiological decline (Fried et al., 2001; Kirkwood, 2005). People with frailty are characterized as having reduced strength and physical function (Mello et al., 2014; Morley et al., 2013; Niederstrasser et al., 2019), which increases their risk of falls, disability, hospitalization, death (Clegg et al., 2013; Fried et al., 2001; Li et al., 2015; Morley et al., 2013), as well as cognitive impairment (Alencar et al., 2013; Borges et al., 2019; Chong et al., 2015; Kojima, Taniguchi et al., 2016). A systematic review revealed that the prevalence of frailty among community-dwelling older adults increases with age group; from 4% in younger- group (65-69years) to 26% in oldest group (85 years and above) (Collard et al., 2012). The same trend appeared in Asia as well (He et al., 2019; Kojima et al., 2017; Woo et al., 2015). In addition to increased age, risk factors of frailty also include inflammation (Welstead et al., 2020), multimorbidity, lifestyle (i.e. sedentary behavior, smoking, alcohol consumption), obesity and chronic pain (Feng et al., 2017; Hanlon et al., 2018; Mello et al., 2014; Niederstrasser et al., 2019; Vetrano et al., 2019), and frailty lead to lower quality of life among older adults (Kojima, Iliffe et al., 2016).

Nevertheless, as the concept of frailty has evolved, frailty is now suggested to be multi-dimensional (Cheung et al., 2021; Frieswijk et al., 2004), psychological and social aspects must be considered as intervention approaches besides the physical aspect. Regarding psychological aspects, older people who have depressive symptoms are at greater risk of being frail (Feng et al., 2017; Gale et al., 2014; Mello et al., 2014).

And those with social vulnerability, including lower socioeconomic status (Mello et al., 2014; Niederstrasser et al., 2019; Szanton et al., 2010), men who live alone (Kojima et al., 2020), and those who feel lonely (Sha et al., 2020), are also at higher risk of being frail.

With an increasing older population, the need for early intervention for frailty in Macao will increase. The Macao Special Administrative Region Government (Macao SAR Government) developed a ten-year action plan for the development of older adult services in 2016 of which medical and welfare services is an area of focus (Macao SAR Government, 2016). With the aim of maintaining an independent life among older adults, disease prevention is the main approach emphasized by the government, yet little is known about the characteristics of well-being of the older population from government data (Macao SAR Government, 2020). As chronic disease, both the cause and result of frailty, continues to be the top cause of healthcare seeking and cause of death (Health Bureau of Macao SAR Government, 2021; Statistics and Census Service of Macao SAR Government, 2021), alongside with older adults are the main public healthcare users in Macao (Leong, 2012), there is an urgent need to understand the current health status of older adults, in order to achieve independent living and healthy ageing. However, studies in the subject of older adult frailty are limited in Macao, which could impede the planning and development of reasonable resources allocation. Hence, the aim of this research was to investigate the frailty status and its association with different aspects of health status in the most aged district in Macao. This could provide insight into the frailty status among older adults in Macao and lay foundation for future intervention for frailty prevention.

2 Methods

2.1 Study Design and Participants

The current study is a cross-sectional survey conducted in a Macao community. According to the

sample size calculation for survey study (Charan & Biswas, 2013; Pourhoseingholi et al., 2013), this study aimed to recruit at least 384 participants, with the level of significance of 0.5, absolute error of 5% and at type 1 error of 5%. Individuals were eligible if they were 1) Macao resident and living in Sac Pai Van public housing cluster; 2) aged 65 years or above; 3) able to speak and understand Cantonese or Mandarin, and 4) able to understand and give informed consent. Individuals were not included if they were 1) diagnosed with dementia or 2) not able to communicate due to hearing problems or mental illness. Ethical approval was obtained from the Research and Management Department of Kiang Wu Nursing College of Macau. Participants were informed of the study's purpose and their right to withdraw at any time. Informed consent was obtained from all participants agreeing to participate.

2.2 Instrument

The study employed interviews using a structured questionnaire which included four sections. The first section was frailty status. The FRAIL scale, which includes Fatigue, Resistance, Ambulation, Illness, and Loss of Weight, was used to determine the frailty status. The FRAIL scale was proposed by the International Academy on Nutrition and Aging (Van Kan et al., 2008), and has been widely used with good to acceptable reliability and validity (Aprahamian et al., 2017; Dong et al., 2018; Li et al., 2015; Malmstrom et al., 2014; Maxwell et al., 2018; Morley et al., 2012). The Chinese version of the FRAIL scale was utilized in this study. The scale includes five self-reported components, each component was scored 1 or 0 point according to answers from participants. The total score of the scale was 0 to 5, representing different frailty status (0=robust, 1-2=pre-frail, 3-5=frail). Fatigue was assessed by asking "how much time during the past four weeks have you felt tired?" Participants were presented with 5 options of "all of the time", "most of the time", "sometimes", "rarely" and "never". Participants who answered "all of the time" and "most of the time" scored 1 point. Resistance was

determined by asking if the participant had any difficulty walking up 10 steps alone and without aid; those who responded "yes" were scored 1 point. Ambulation was obtained by asking if the participant had any difficulty walking several hundred meters alone and without aid; those who responded "yes" were scored 1 point. Illness was scored 1 point for participants who reported 5 or more illnesses out of 11 options (hypertension, diabetes, cancer [other than a minor skin cancer], chronic lung disease, heart disease [heart attack, congestive heart failure, angina], asthma, arthritis, stroke, kidney disease, hypercholesterolemia, and osteophyte). Loss of weight was scored 1 point for participants who affirmed a weight decline of 5% or greater in the past month.

The second section focused on the well-being of participants. Physical well-being involved physical activities and Body Mass Index (BMI). Physical activity information was obtained from participants by asking whether they had regular exercise a week preceding the interview and were given response options of "Yes" and "No". BMI was measured and recorded using a weight scale with height measurements by a trained interviewer. Psychological well-being was assessed by using the Patient Health Questionnaire-2 (PHQ-2). Two questions were asked that enquired how often participants had been bothered by the following two problems over the past two weeks: 1) little interest or pleasure in doing things; 2) feeling down, depressed or hopeless (Kroenke et al., 2003). Participants were presented with four options for each question: "not at all", "several days", "more than half the days", "nearly every day", and were scored 0 to 3 points respectively. Participants were considered to have depressive mood if the summary score of the PHQ-2 was ≥ 3 . The Cronbach's α for the scale was 0.76 among a sample from the general public in Hong Kong (Yu et al., 2011) and 0.89 in the current study. Social well-being was obtained by asking participants whether they had 1) participated in social activities (including any activities hosted by any social associations, religious organizations, community

centers or the government) in the past year, and 2) attended any courses or classes (courses to learn certain skills or knowledge) in the past three years. Participants were given response options of “Yes” and “No” for the two questions. Self-rated health (SRH) was also assessed in this section, using a single question of “In general, would you say your health is?” with options of “very good,” “good,” “fair,” “poor” or “very poor”. It has been widely used in general population surveys.

The third section was to collect socio-demographic information including age, gender, living condition, education level, marital status, number of children and religious beliefs.

The last section was to assess cognitive status of the participant. The Mini-Cog was utilized, which includes 3-word recall and a clock-drawing task and has good sensitivity and specificity (Borson et al., 2000; Borson et al., 2003). Trained interviewers first instructed the participant to listen to three words carefully, then asked the participant to repeat immediately and to remember. After immediate 3-word recall, participant was asked to draw a clock that has all the numbers and place it as ten minutes past eleven o'clock on a paper with a preprinted circle. The drawing was assessed by the research team to determine if it was normal. When the clock-drawing task was finished, participants were asked to repeat the three words again, each word recalled correctly without any hints was considered a success. Participants with 3 words recalled (no need to consider the clock-drawing result) and those with 1 to 2 words recalled and a normal clock were also considered passing the Mini-Cog assessment, suggesting no cognitive impairment. Participants who recalled 1 to 2 words but had an abnormal clock, and those with 0 words recalled were considered failing the Mini-Cog assessment. Those who failed the Mini-Cog assessment were further administered the Montreal Cognitive Assessment (MoCA) assessment to determine the cognitive status of the participant. Participants with MoCA result of $>16^{\text{th}}$ percentile were considered to

have no cognitive impairment and those with MoCA result of $\leq 16^{\text{th}}$ percentile were considered to have cognitive impairment.

2.3 Recruitment/ Data collection

We recruited participants from a community center for older adults in Sac Pai Van public housing cluster. There were about 300,000 persons living in the community in 2020 (Islands District Community Service Advisory Committee of Macao SAR, 2020). The community center has a mass member network of older people living in the community, which has more than 1,800 members over the age of 55. An invitation letter was distributed to the mailbox to selected units, inviting those who met the inclusion criteria to contact the community center and schedule an interview time. Participants were individually interviewed by a trained interviewer in the older adult community center. Verbal consent was obtained from all participants prior to the face-to-face interview. Participants were informed that they could stop the interview at any time or skip questions they did not want to answer. Data was collected from September 2019 to October 2020 (recruitment was temporary ceased between January and April 2020 due to the COVID-19 pandemic).

2.4 Statistical Analysis

Raw data were coded in Microsoft Office Excel 2013 and transferred to the Statistical Package for the Social Sciences Version 22 (SPSS, v22) for data manipulation and statistical analyses. Univariate analysis was performed to summarize the socio-demographic characteristics, physical, psychological, social well-being, cognitive status and frailty status (robust and pre-frailty/frailty) of participants. Chi-square or Fisher's exact tests were performed for categorical variables. To investigate the associated factors of frailty status, logistic regressions were performed, adjusting for socio-demographic characteristics. Associations of frailty outcomes with physical, psychological, social and cognitive well-being were estimated using odds ratio (OR) with their 95%

confidence intervals. The regression models were built by first adding demographic characteristics, and subsequently adding physical, psychological, social and cognitive well-being to examine the separate contribution of each variable to frailty status (0=robust; 1=pre-frail/frail). Only data from participants who finished all assessments were entered in the regression models. The level of statistical significance of all tests was set at $p<0.05$.

2.5 Ethical approval

Ethical approval for the study was obtained from the Research Management and Development Department of Kiang Wu Nursing College of Macau (reference: 2019MAY01). Participants were informed of the study's purpose and their right to withdraw at any time. Informed consent was obtained from all participants agreeing to participate.

3 Result

3.1 Participant characteristics

We received 662 responses, of which 572 were valid. Responses were regarded as invalid if they did not meet the inclusion criteria. Among the valid responses, almost 70% of participants were female, participants were aged between 65 and 94 years (mean age 74.6 ± 6.00 years). Most had a primary school or below education level, were married or cohabited, had children, did not have religious beliefs, and were living with others. Regarding physical well-being, over 85% of participants had regular exercise in the past week, almost 50% of participants had normal BMI; however, 47% of participants were overweight or obese. Over 90% of participants did not have depressive mood (based on the PHQ-2 scores) at the time of the investigation. Most of the participants had participated in at least one social activity in the past year, only 26% attended course/class in the past three years. Regarding cognition and SRH, 13% of participants had cognitive impairment and over 70% rated their health as fair, bad or very bad (Table 1).

3.2 Prevalence of frailty

According to the FRAIL scale assessment, about a quarter of the participants were in pre-frail or frail state, and most of them did not have cognitive impairment (mean scores 0.31 ± 0.62). Among the 5 components of the FRAIL scale, the most prevalent component was fatigue. None of the participants had lost weight 5% or over in the past month. Among all variables, gender, education, PHQ-2 score and SRH were significantly correlated with frailty status (Table 1).

3.3 Factors associated with frailty status

The results of multiple logistic regression revealed that the score of PHQ-2 and SRH were associated with frailty status. Participants with higher PHQ-2 score were 11 times more likely to be in pre-frail/frail status (aOR=11.09, $p<0.001$) when compared to their counterparts with lower scores. Moreover, those who rated their health as not good were 4 times more likely to be in pre-frail/frail status (aOR=4.36, $p<0.001$) than those who rated their health as good. After accounting for other well-being variables, the results remained the same (aOR=11.49 for PHQ-2 score, $p<0.001$; aOR=4.19 for SRH, $p<0.001$) All other variables were not statistically significant (Table 2).

According to the references reviewed, prevalence of frailty varies in different age groups. Also, age differences were observed in factors associated with frailty status. The categorization of younger and older age groups in this study was determined by the age distribution of recruited participants. For participants with depressive mood, the risk of being frail/pre-frail among those aged 65 to 74 years was substantially lower than those aged 75 years and above (aOR=8.90 vs. aOR=20.98). The influence of SRH on frailty status was higher in those 65 to 74 years of age than those aged 75 years and above (aOR=5.71 vs. aOR=3.58) (Table 3). Due to small sample of male participants, sex stratification analysis was not performed.

Table 1 General characteristics and well-being of participants

Variables	Total (N=572)		Robust (N=436)		Pre-frail/ Frail (N=136)		p-value
	n	%	n	%	n	%	
Gender							0.03
Male	174	30.42	143	32.80	31	22.79	
Female	398	69.58	293	67.20	105	77.21	
Age (year)							0.62
65-74	309	54.02	238	54.59	71	52.21	
75-84	222	38.81	165	37.84	57	41.91	
≥85	41	7.17	33	7.57	8	5.88	
Education							0.01
None	96	16.78	71	16.28	25	18.38	
Primary school or below	310	54.20	225	51.61	85	62.50	
Junior high or higher	166	29.02	140	32.11	26	19.12	
Marital status							0.23
Married/ cohabited	325	56.82	254	58.26	71	52.21	
Not married*	247	43.18	182	41.74	65	47.79	
Living							0.42
Alone	244	42.66	186	42.66	58	42.65	
With spouse	261	45.63	203	46.56	58	42.65	
With others†	67	11.71	47	10.78	20	14.71	
Children							0.14
No children	44	7.69	38	8.72	6	4.41	
Have children	528	92.31	398	91.28	130	95.59	
Religious belief							0.84
Yes	223	38.99	169	38.76	54	39.71	
None	349	61.01	267	61.24	82	60.29	
Exercise in the past week							0.11
Yes	495	86.54	383	87.84	112	82.35	
No	77	13.46	53	12.16	24	17.65	
Physical activities in the past week							0.51
Yes	61	10.66	47	10.78	14	10.29	
No	511	89.34	389	89.22	122	89.71	
BMI							0.38
Normal (18.5-24.9)	280	48.95	220	50.46	60	44.12	
Underweight (<18.5)	23	4.02	18	4.13	5	3.68	
Overweight/ obesity (≥25.0)	269	47.03	198	45.41	71	52.21	
PHQ-2 score							0.00
0-2	521	91.08	423	97.02	98	72.06	
3-6	51	8.92	13	2.98	38	27.94	
Participated in social activities in the past year							0.59
Yes	407	71.15	313	71.79	94	69.12	
No	165	28.85	123	28.21	42	30.88	
Attended course in the past 3 years							0.74
Yes	150	26.22	116	26.61	34	25.00	
No	422	73.78	320	73.39	102	75.00	
Self-rated health							0.00
Good	159	27.80	145	33.26	14	27.80	
Not good	413	72.20	291	66.74	122	72.20	
Cognitive impairment (N=506)							0.88
No	439	86.76	331	86.88	108	86.40	
Yes	67	13.24	50	13.12	17	13.60	
FRAIL scale score							-
Robust (score 0)	436	76.22	-	-	-	-	
Pre-frail (score 1-2)	131	22.90	-	-	-	-	
Frail (score 3-5)	5	0.87	-	-	-	-	
FRAIL Scale components							-
Fatigue	105	18.4	-	-	-	-	
Resistance	42	7.3	-	-	-	-	
Ambulation	20	3.5	-	-	-	-	
Illness	11	1.9	-	-	-	-	
Loss of weight	0	0	-	-	-	-	

* Including unmarried, separated, divorced, and widowed.

† With children, spouse and children, domestic helper, and/or relatives.

Table 2 Multiple logistic regression models of frailty status (0=robust; 1=pre-frail/frail) (N=506)

Variables	Sociodemographic-adjusted model*							Fully adjusted model†						
	B	SE	Wald	p-value	Exp (B)	95% CI for Exp (B)		B	SE	Wald	p-value	Exp (B)	95% CI for Exp (B)	
						Lower	Upper						Lower	Upper
Constant								-3.76	0.93	16.41	0.00	0.02		
<i>Sociodemographic factors</i>														
Gender (ref.: Male)														
Female	0.31	0.26	1.44	0.23	1.37	0.82	2.28	0.13	0.30	0.19	0.67	1.14	0.63	2.06
Age (year) (ref.: 65-74)														
75-84	0.13	0.21	0.37	0.54	1.14	0.75	1.74	0.18	0.25	0.51	0.48	1.20	0.73	1.95
≥85	-0.46	0.44	1.08	0.30	0.63	0.27	1.50	0.19	0.52	0.13	0.72	1.21	0.44	3.33
Living (ref.: Alone)														
With spouse	0.47	0.40	1.38	0.24	1.60	0.73	3.49	0.12	0.47	0.06	0.80	1.12	0.45	2.80
With others	0.51	0.35	2.11	0.15	1.66	0.84	3.31	0.38	0.43	0.78	0.38	1.47	0.63	3.44
Education (ref.: None)														
Primary school or below	0.15	0.28	0.28	0.60	1.16	0.67	2.01	0.16	0.35	0.22	0.64	1.18	0.59	2.34
Junior high or higher	-0.49	0.34	2.01	0.16	0.62	0.31	1.20	-0.29	0.41	0.50	0.48	0.75	0.33	1.68
Marital status (ref.: Married/ cohabited)														
Not married	0.55	0.38	2.11	0.15	1.73	0.83	3.60	0.28	0.44	0.41	0.52	1.32	0.56	3.12
Children (ref.: No children)														
Have children	0.68	0.47	2.08	0.15	1.97	0.78	4.94	0.55	0.53	1.08	0.30	1.73	0.62	4.84
Religious belief (ref.: Yes)														
None	0.00	0.21	0.00	0.99	1.00	0.67	1.50	-0.13	0.24	0.29	0.59	0.88	0.55	1.41
<i>Physical well-being</i>														
Exercise in the past week (ref.: Yes)														
No	0.47	0.28	2.79	0.10	1.61	0.92	2.80	-0.17	0.38	0.20	0.66	0.85	0.40	1.78
Physical activities in the past week (ref.: Yes)														
No	-0.02	0.33	0.00	0.96	0.98	0.51	1.88	0.18	0.39	0.22	0.64	1.20	0.56	2.57
BMI (ref.: normal)														
Underweight	0.01	0.54	0.00	0.99	1.01	0.35	2.93	-0.05	0.64	0.01	0.94	0.95	0.27	3.37
Overweight/ obesity	0.21	0.21	1.01	0.31	1.24	0.82	1.86	0.28	0.24	1.32	0.25	1.32	0.82	2.12
<i>Psychological well-being</i>														
PHQ-2 score (ref.: 0-2)														
3-6	2.41	0.35	48.41	0.00	11.09	5.63	21.83	2.44	0.41	35.76	0.00	11.49	5.16	25.56
<i>Social well-being</i>														
Participated in social activities in the past year (ref.: Yes)														
No	0.22	0.23	0.95	0.33	1.25	0.80	1.96	0.04	0.27	0.03	0.87	1.04	0.61	1.79
Attended course in the past 3 years (ref.: Yes)														
No	0.06	0.24	0.06	0.80	1.06	0.66	1.70	0.18	0.28	0.44	0.50	1.20	0.70	2.07
<i>Cognitive well-being</i>														
Cognitive impairment (n=506) (ref.: No)														
Yes	-0.16	0.33	0.22	0.64	0.85	0.45	1.64	-0.25	0.38	0.44	0.51	0.78	0.37	1.64
Self-rated health (ref.: Good)														
Not good	1.47	0.31	23.12	0.00	4.36	2.39	7.93	1.43	0.34	17.39	0.00	4.19	2.14	8.20

*Adjusted for sociodemographic factors and in each aspect of well-being.

†Adjusted for sociodemographic factors and all aspect of well-being.

Table 3 Multiple logistic regression models of frailty status (age stratification) (0=robust; 1=pre-frail/frail) (N=506)

Variables	Aged 65-74 (N=278)								Aged ≥75 (N=228)							
	B	SE	Wald	p-value	Exp (B)	95% CI for Exp (B)		B	SE	Wald	p-value	Exp (B)	95% CI for Exp (B)			
						Lower	Upper						Lower	Upper		
Constant	-4.22	1.32	10.19	0.00	0.01			-3.77	1.62	5.43	0.02	0.02				
<i>Sociodemographic factors</i>																
Gender (ref.: Male)																
Female	0.05	0.40	0.02	0.89	1.06	0.49	2.29	0.24	0.51	0.23	0.63	1.28	0.47	3.47		
Living (ref.: Alone)																
With spouse	0.62	0.74	0.69	0.41	1.85	0.43	7.94	0.33	0.76	0.18	0.67	1.38	0.31	6.17		
With others	1.38	0.75	3.36	0.07	3.99	0.91	17.51	-0.47	0.66	0.51	0.48	0.62	0.17	2.28		
Education (ref.: None)																
Primary school or below	0.06	0.57	0.01	0.92	1.06	0.35	3.23	0.16	0.48	0.12	0.73	1.18	0.46	3.00		
Junior high or higher	-0.31	0.63	0.24	0.62	0.73	0.21	2.54	-0.49	0.59	0.68	0.41	0.61	0.19	1.95		
Marital status (ref.: Married/ cohabited)																
Not married	0.57	0.70	0.65	0.42	1.76	0.45	6.98	0.73	0.72	1.02	0.31	2.08	0.50	8.54		
Children (ref.: No children)																
Have children	0.41	0.61	0.46	0.50	1.51	0.46	5.01	0.49	1.15	0.19	0.67	1.64	0.17	15.49		
Religious belief (ref.: Yes)																
None	-0.32	0.34	0.91	0.34	0.73	0.38	1.40	0.13	0.38	0.12	0.73	1.14	0.54	2.43		
<i>Physical well-being</i>																
Exercise in the past week (ref.: Yes)																
No	0.05	0.54	0.01	0.92	1.06	0.37	3.02	-0.45	0.60	0.57	0.45	0.64	0.20	2.05		
Physical activities in the past week (ref.: Yes)																
No	0.33	0.51	0.40	0.53	1.38	0.51	3.80	0.12	0.63	0.04	0.85	1.13	0.33	3.84		
BMI (ref.: normal)																
Underweight	0.45	1.05	0.18	0.67	1.56	0.20	12.17	-0.34	0.85	0.16	0.69	0.71	0.13	3.74		
Overweight/ obesity	0.18	0.33	0.29	0.59	1.19	0.62	2.28	0.26	0.38	0.48	0.49	1.30	0.62	2.74		
<i>Psychological well-being</i>																
PHQ-2 score (ref.: 0-2)																
3-6	2.19	0.53	17.33	0.00	8.90	3.18	24.91	3.04	0.71	18.21	0.00	20.98	5.18	84.93		
<i>Social well-being</i>																
Participated in social activities in the past year (ref.: Yes)																
No	-0.30	0.38	0.59	0.44	0.74	0.35	1.58	0.56	0.42	1.82	0.18	1.76	0.77	4.00		
Attended course in the past 3 years (ref.: Yes)																
No	0.32	0.38	0.70	0.40	1.38	0.65	2.92	-0.02	0.42	0.00	0.96	0.98	0.43	2.24		
<i>Cognitive well-being</i>																
Cognitive impairment (N=506) (ref.: No)																
Yes	-0.82	0.67	1.48	0.22	0.44	0.12	1.64	-0.12	0.52	0.06	0.81	0.88	0.32	2.43		
Self-rated health (ref.: Good)																
Not good	1.74	0.54	10.57	0.00	5.71	2.00	16.34	1.28	0.47	7.50	0.01	3.58	1.44	8.93		

4 Discussion

To our knowledge, this is the first study examining the association between different aspects of well-being (i.e. physical, psychological, social and cognitive) and frailty status among community-dwelling older adults in Macao. The FRAIL scale was utilized in the current study since it is recommended as a screening tool in community settings (Dong et al., 2018; Li et al., 2015; Malmstrom et al., 2014; Morley et al., 2012). Over 75% of participants in the current study were in robust status. The prevalence of frailty in the current sample was lower than studies conducted in communities using the same measurement (Dong et al., 2018; Woo et al., 2015).

Our study revealed that psychological well-being was an independent factor associate with frailty in older adults in Macao, which is similar to previous studies (Feng et al., 2017; Gale et al., 2014; Mello et al., 2014). Arahamian et al. (2017) suggested that the FRAIL scale has two dimensions, physical performance (resistance and ambulation) and health status (fatigue, illnesses, and weight loss), the later was more associated with depressive symptoms (Arahamian et al., 2017). In our sample of participants, almost 20% were positive in the fatigue component, this may contribute to the significant effect of psychological well-being on frailty status. Frailty and depressive symptoms are common among older adults, there are discussions about the reciprocal relationship between the two conditions (Buigues et al., 2015; Collard et al., 2017; Collard et al., 2015; Soysal et al., 2017). A previous study also proposed that specific types of depression, i.e. vascular depression, is an early symptom for frailty (Paulson & Lichtenberg, 2013). Although we did not observe significant associations between age and frailty status in the pooled analysis, there were age differences regarding the effects of psychological well-being on frailty status. Participants aged 75 years and above who scored higher in PHQ-2 had significant higher risk of being in pre-frail/frail status. This finding indicates that interventions regarding psychological health for frailty may be more

effective, especially among older age groups in Macao.

SRH is a valid measure of health status and a predictor of subsequent health outcomes in older adults, such as functional decline, frailty, mortality, and hospital utilization (Desalvo et al., 2006; Gijzel et al., 2017; Gyasi & Phillips, 2018; Idler & Benyamini, 1997; Viljanen et al., 2021). However, studies suggest that the relationship between SRH and frailty is bidirectional (Abu et al., 2020; Chu et al., 2021; Ocampo-Chaparro et al., 2013). The results of this present study revealed that poor SRH was associated with frailty status, especially in younger age groups (64 to 75 years) in our sample. Poorer SRH is associated with elevated inflammatory markers and dysfunction among older adults (Christian et al., 2011; Martin, 2014), which could explain the mechanism of the relationship of poor SRH and frailty (Welstead et al., 2020). To identify frailty early, therefore, attention is warranted with poor SRH older adults.

Although frailty is multi-dimensional (Cheung et al., 2021; Frieswijk et al., 2004), we did not observe the effect of physical, social and cognitive well-being on the risk of frailty status. Low physical functioning is a characteristic of frailty; physical activities, therefore, are considered to reduce frailty (Mello et al., 2014; Morley et al., 2013; Niederstrasser et al., 2019). The result of no association between physical activity or exercise in this study might be due to the low frailty rate in this study. Furthermore, over 95% of those who exercised in the past week were engaged in low-intensity exercise, which is not adequate according to World Health Organization guidelines (World Health Organization, 2020). Nevertheless, lifestyle intervention such as physical activity and exercise are effective strategies to counteract frailty-related physical impairment among older adults (Angulo et al., 2020). On the other hand, BMI was not found to be associated with frailty. In Amiri et al. (2020)'s study, only self-reported BMI was associated with increased frailty risk. Studies reported that there is a difference between self-reported and

measured BMI (Maukonen et al., 2018), this could explain the insignificant relationship between BMI and frailty because we measured BMI using standard weight scale with height measurement.

The effect of social participation on frailty is inconsistent. While several studies revealed that social participation may decrease the risk of frailty (Kwan et al., 2019; Wang et al., 2021), others did not predict future frailty (Kamiya & Kenny, 2017). Since social participation takes various forms based on levels of individuals involvement and goals of participation (Levasseur et al., 2010), frequent participation and diverse types of participation have more positive effects on frailty (Xie & Ma, 2021). We assessed social participation with the questions of one-year social activity and three-year course participation, the lengthy time frame of the question may contribute to the result of insignificant relationship between social participation and frailty.

Cognitive impairment was not an associated factor of frailty in this study, which is not consistent with previous studies that have demonstrated higher cognitive impairment rates in population with frailty (Jürschik et al., 2012; Yassuda et al., 2012). Ní Mhaoláin et al. (2011)'s study also showed no association between cognitive impairment and frailty, suggesting that frailty and cognitive impairment may have different physiological pathways. Although no significant association between cognitive well-being and frailty status was found in the current study, previous studies suggest that frailty predicts increased rate of cognitive decline in older adults (Boyle et al., 2010; Buchman et al., 2007; Buchman et al., 2008). Hence, cognitive well-being among older adults is worth noting.

Since disease prevention is the main approach to maintaining independence functioning of older adults in Macao, frailty screening can offer an opportunity for the early detection of frailty. In addition, studies indicate that frailty among older people is a dynamic process. The frailty state of an individual can changes over time,

whether regressing, remaining or progressing, due to different aforementioned risk factors that an individual may possess (Chong et al., 2015; Gill et al., 2006; Hardy et al., 2005; Setiati et al., 2019). Therefore, by conducting community frailty screenings, early interventions targeting the mental health of older adults can be offered, which may improve, or at least maintain, the frailty state and could offer older people a better quality of life (Gobbens & Van Assen, 2014), and reduce government's healthcare expenditure (Ensrud et al., 2018; Ensrud et al., 2020).

4.1 Limitation

Limitations of the study include its cross-sectional and self-reported nature. The results need to be validated by longitudinal studies. Since cross-sectional study could only provide correlation between variables, while longitudinal design could provide more information about the causes of frailty. Self-reported measurements might cause participants to withhold information, which could lead to reporting bias. Also, the interruption in the data collection due to the COVID-19 pandemic lockdown may have affected the nature of responses from participants. For example, some people experienced greater mental health problems during the COVID-19 pandemic lockdown, especially among older people who may have experienced isolation. Furthermore, reporting bias could have occurred because participants responded to the interview voluntarily. Most of the data were collected through self-report, rather than in-home survey, which may have reduced the availability of frail individuals who could not participate because they were homebound. Another issue involves the limitation of the generalizability of our results to a larger population because the results come from only one community. Further study is needed to measure data objectively across different communities in Macao. Although this study identified psychological well-being and SRH were associated with increased risk of frailty, confounding factors are needed to be considered in future studies, such as family

relationship and social support, which were not included in the study.

5 Conclusion

The current study showed that psychological well-being and SRH were associated with the frailty status among community-dwelling older adults in Macao, the result is more profound in the older age group (75 years of age or older). The evidence highlights the importance of strategies to improve the psychological well-being among older adults, in order to prevent frailty and to better support older adult services in an aging society.

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Motivation for Adopting COVID Preventive Practices Among Healthcare Workers: A Cross-Sectional Analysis of Three Competing Models

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[Abstract] Background: Healthcare workers' risk perceptions towards contracting Coronavirus 2019 (COVID-19) may determine their adoption of preventive behaviors. The adoption of six-feet physical distancing and wearing face coverings reduces the spread of COVID-19 in the community setting. Three theoretical models, the Health Belief Model (HBM), the Protection Motivation Theory (PMT) and the Theory of Planned Behavior (TPB) have been used to determine the adoption of preventive practices in relation to infectious diseases. Objective: We examined the association between measures of behavioral models guiding preventive practices and using COVID-19 preventive practices (physical distancing and face coverings) among healthcare workers. Methods: A cross-sectional study using an electronic survey of healthcare workers ($N=279$) in the southeastern United States. Results: Of the HBM measures, the perceived severity and benefits subscales were associated with physical distancing. Of the PMT measures, the perceived severity and response efficacy subscales were associated with physical distancing, whereas the vulnerability, extrinsic reward, and intention subscales were associated with facial coverings. Finally, no TPB measures were directly associated with outcome measures. Conclusions: Future studies may assess how theoretically derived measures may be useful in guiding interventions to support preventive practices adoption among healthcare workers in future infectious disease public health situations.

[Key Words] COVID-19 preventive practices Theory of Planned Behavior Protection Motivation Theory Health Belief Model

醫護人員採用 COVID 預防措施動機調查：
三種模型指導下的措施對比Chizimuzo T. C. Okoli^{1*} Zainab Almogheer¹ Sarret Seng¹ Bassema Abufarsakh¹ Wanqing Xie²

【摘要】 背景：醫護人員對 2019 冠狀病毒感染（COVID-19）的風險認知可決定其採取預防措施。保持六英尺的社交距離和戴口罩可減少 COVID-19 在社區中的傳播。以往採用健康信念模型（HBM）、保護動機理論（PMT）和計劃行為理論（TPB）模型來指導控制其他傳染病的預防措施。目的：研究針對以上三個理論模型指導下的預防措施的測量與 COVID-19 預防措施中的社交距離和口罩的關係。方法：本橫斷面研究對美國東南部醫療工作者（ $N=279$ ）進行電子問卷調查。結果：在 HBM 為指導的預防措施的測量中，感知到的嚴重性和益處與保持社交距離相關；在 PMT 為指導的預防措施的測量中，感知到的嚴重性和反應效能與保持社交距離相關，而易感性、外在獎勵和意圖與戴口罩相關；在 TPB 為指導的預防措施的測量中，未發現與社交距離和戴口罩相關的因素。結論：未來研究應該評估在理論模型指導下的預防措施對控制傳染病的有效性。

【關鍵詞】 COVID-19 預防措施 計劃行為理論 保護動機理論 健康信念模型

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1 Introduction

Disruptions in healthcare delivery during the early days of the Coronavirus Disease 2019 (COVID-19) pandemic led to a focus on addressing hospital and clinic preparedness and response, rapid diagnostic testing, and public health actions to mitigate the spread of the disease (Adalja et al., 2020). Infectious disease outbreaks in hospital settings often test the strength of and adherence to infection disease control protocols. However, with the rapid spread of COVID-19, several hospital systems adopted measures, often beyond governmental regulations, to provide protection to both patients and healthcare workers (Rhee et al., 2020). Moreover, stringent protocols were implemented to enhance better patient and staff protection, including screening of all visitors for respiratory symptoms, restricting healthcare workers from duties if they reported any upper respiratory symptoms, screening of all patients for respiratory viruses, and using contact and droplet precautions (including eye protection) when engaged in patient care (Klompas, 2020). Population level studies indicate that being a healthcare worker is a significant predictor of adherence to COVID-19 preventive behaviors (Barakat & Kasemy, 2020). However, given varying recommendations between hospital systems, along with constant regulatory updates from governing bodies (e.g., U.S.A. Centers for Disease Prevention and Control, CDC), healthcare workers may have adopted COVID-19 preventive measures to various degrees.

2 Literature Review

In the community setting, adoption of physical distancing, face covering, and eye protection can reduce the spread of COVID-19 (Chu et al., 2020). In fact, communities that adopt such preventive measures have been shown to decrease the rates of COVID-19 transmission (Lyu & Wehby, 2020; Thu et al., 2020). However, several intrinsic and extrinsic factors may influence an individual's intention to adopt COVID-19

preventive measures. Intrinsic factors include perceptions of infection risk, effectiveness of preventive measures, and attitudes towards preventive measures (Beeckman et al., 2020; Coroiu et al., 2020). Extrinsic factors include social acceptability of measures, social support, neighborhood income, and information about COVID-19 (Coroiu et al., 2020; Jay et al., 2020). Yet, such factors have not been well studied among healthcare workers. An understanding of such intentional factors may be informative in supporting the adoption of preventive practices.

Several theoretical frameworks and models have been used to determine intrinsic motivation towards adopting preventive practices. The Health Belief Model (HBM) (Champion & Skinner, 2008) is a psycho-social framework that predicts the reasons individuals act on measures to prevent, screen, or control illness conditions. The key constructs of the HBM are *perceived susceptibility* (belief regarding chances of getting a condition), *perceived severity* (belief regarding the seriousness of a condition), *perceived benefits* (beliefs about preventative actions to reduce risk of a condition), *perceived barriers* (belief about costs of taking preventative actions), cues to action (ways to get ready for the action), and *self-efficacy* (the confidence one has in the ability to take preventative action). This framework has been useful in understanding the use of preventative behaviors regarding preventing respiratory infections such as the use of face covering, handwashing, and social distancing (Ghanbari et al., 2014; Karimi et al., 2016; Okoli et al., 2022; Sim et al., 2014). Thus, this model may be a useful framework to understand healthcare workers' risk perceptions regarding COVID-19 contamination and infection.

Like the HBM, the Protection Motivation Theory (PMT) proposes that behavioral intention tends to be motivated by two main related pathways which include *threat appraisal* (an assessment of threat perceptions towards behaviors or diseases) and *coping appraisal* (an

assessment of the ability to cope with a threatening situation, behavior, or disease) (Milne et al., 2000; Rogers, 1975). Threat appraisal can be measured by perceived severity of the threat, vulnerability to the threat, intrinsic rewards and extrinsic rewards, and fear arousal; whereas coping appraisal is determined by response efficacy, self-efficacy, and response cost. The PMT has been used to examine the behaviors related to the prevention of pandemic influenza among high school students, social distancing behavior, and the use of face covering to prevent Severe Acute Respiratory Syndrome (SARS) (Sharifirad et al., 2014; Tang & Wong, 2004; Williams et al., 2015). Furthermore, this model has been proposed as a potential framework that could be used to understand the protective measures used to prevent the current COVID-19 pandemic (Khosravi, 2020). Hence, the PMT may be used to understand preventive measure adoption among healthcare workers.

A final salient model that examines health behavior is the Theory of Planned Behavior (TPB) (Ajzen, 1991). This is a psycho-social theory that examines the predictive ability of *attitudes* towards a behavior, *subjective norms*, and *perceived behavioral control* in the intentions towards a behavior and the actual behavior. The attitudes towards a behavior include an individual's degree of favorable judgements towards it; the subjective norms include the perception of social pressure to execute the behavior (or not); and perceived behavioral control comprises the degree to which a person considers the behavior challenging to accomplish (Ajzen, 1991). The TPB has been used to explain healthcare workers hand hygiene and other protective behaviors (e.g., using face covering to avoid air pollution) (Hansstein & Echegaray, 2018; Srigley et al., 2015). Given the utility of the TPB in addressing health behavior protective measure adoption, it may be a useful theory to understand COVID-19 behavioral intentions among healthcare workers.

2.1 Purpose

Given the novelty of the COVID-19 pandemic, at the early stages in the U.S., and lack of evidence-based information, it was unclear how to guide the understanding of the adoption of preventive practices among healthcare workers. Indeed, with the challenge of misinformation regarding preventive practices (such as wearing facemasks), even promoted by some healthcare providers, there was a need to understand factors which influenced healthcare workers motivations to adopt preventive practices (Ayers et al., 2021; Sule et al., 2023). Therefore, given the significant health risk associated with contracting COVID-19 among healthcare workers, the purpose of this study was to examine the extent to which theoretically based models predicted preventive practice adoption by healthcare workers during the early stages of the COVID-19 pandemic in the U.S. The research questions guiding this study were: 1) How does the HBM explain the adoption of preventive practices by healthcare providers? 2) How does the PMT explain the adoption of preventive practices by healthcare providers? 3) How does the TPB explain the adoption of preventive practices by healthcare providers? To answer these questions, the specific aims of the study were to examine:

1. The associations between the HBM model measures and frequency of reported adoption of preventive practices (i.e., physical distancing and face coverings) while accounting for demographic and work-related variables
2. The associations between the PMT model measures and frequency of reported adoption of preventive practices while accounting for demographic and work-related variables
3. The associations between the TPB model measures and frequency of reported adoption of preventive practices while accounting for demographic and work-related variables

3 Methodology

3.1 Design

This cross-sectional study used an electronic survey to determine the associations between theoretically derived behavioral risk perceptions for contracting COVID-19 and the adoption of preventive measures from a sample of healthcare workers. We used the STROBE checklist for cross-sectional studies to ascertain that our research procedures were reported adequately (von Elm et al., 2007).

3.2 Sample

Our study sample was obtained from a convenience sample of healthcare workers in an academic-medical center in the south-eastern U.S. To be included in the study, participants had to be: 1) currently employed (part-time or full-time staff) at the academic-medical center, and 2) 18 years of age or older. Exclusion criteria were: 1) provisional staff or travelers, and 2) those who did not work at the academic-medical center during the study period.

3.3 Procedures

The 10-minute survey was developed using Qualtrics, a web-based survey administration software that can be used to ensure anonymity. The survey was sent to the e-mail listservs of staff in the academic medical center for a 3-month period, from May 1st, 2020 to July 31st, 2020. A cover sheet accompanied the email with an explanation of the study goals and procedures. Interested participants indicated their willingness to take part in the study by clicking on a link that directed them to the electronic survey. To minimize response bias, the anonymous survey was developed in such a way that participants could skip questions which made them uncomfortable. As an incentive to participate, those who completed the survey were entered into a drawing for one of four \$50 visa gift cards. Ethical approval for the study procedures was obtained from the University of Kentucky Institutional Review Board Exemption certificate # 58974.

3.4 Measures

Demographics: The survey collected demographic information on gender (i.e., male vs. female), sexual orientation (i.e., heterosexual vs. non-heterosexual), age in categories (i.e., 18-25 yrs vs. 26-35 yrs vs. 36-50 yrs vs. 51 yrs and older) marital status (i.e., single, never married vs. cohabiting vs. divorced/separated vs. married/widowed), ethnicity (i.e., non-white vs. white, non-Hispanic), and educational attainment (i.e., some college vs. college graduate vs. postgraduate). For analysis, we dichotomized marital status into 'single' or 'other'.

Professional role and work-related variables: We obtained responses on the respondent's professional role, work tenure in year categories (i.e., 6 months or less vs. 7 months to 1 yr vs. 1-3 yrs vs. 3-5 yrs vs. 5-10 yrs vs. 10 yrs or greater), and type of shift work (i.e., days vs. nights vs. other). For analysis we categorized professional role into 'clinical nurse' and 'other' and shift work was categorized into 'days' and 'other'.

HBM measure: This HBM measure was based on adaptations of prior studies using the HBM to assess risk behaviors (Aldohaian et al., 2019; Othman et al., 2019). The measure included 17 questions categorized into subscales of perceived susceptibility (3 questions), perceived severity (2 questions), perceived benefits (3 questions), perceived barriers (3 questions), cues to action (2 questions), perceived self-efficacy (2 questions), and intention (2 questions) (see supplementary materials Appendix A). Each question was based on a response choice of 0=completely disagree to 10=completely agree. Cronbach's alpha coefficients for the subscales fell between 0.47 to 0.89. Mean scores for the responses to the questions in each subscale were calculated.

PMT measure: The PMT measure was adapted from others using the PMT to examine health behaviors (Camerini et al., 2019; Ling et al., 2019). The measure included 19 questions grouped into subscales of

perceived severity (2 questions), perceived vulnerability (2 questions), intrinsic reward (2 questions), extrinsic reward (2 questions), fear arousal (3 questions), response efficacy (2 questions), perceived self-efficacy (2 questions), response cost (2 questions), and intention (2 questions) (see supplementary materials Appendix B). Each question was based on a response choice of 0=completely disagree to 10=completely agree, except for the intention questions which were on a scale of 1=completely disagree and 7=completely agree. Cronbach's alpha coefficients for the subscales fell between 0.66 to 0.89. Mean scores for the responses to the questions in each subscale were calculated.

TPB measure: The TPB measure was developed based on an instruction manual provided by the original TPB developers (Ajzen, 2019). The measure included 11 questions sorted into subscales of intentions (2 questions), attitudes (3 questions), subjective norms (3 questions), and perceived behavioral control (3 questions) (see supplementary materials Appendix C). Each question was based on a response choice of 1=completely disagree to 7=completely agree, except for intention which was based on a scale of 1=completely disagree and 7=completely agree. Cronbach's alpha coefficients for the subscales fell between 0.62 to 0.89, with a total coefficient of 0.88. Mean scores for the responses to the questions in each subscale were calculated.

Preventive practices: We asked participants about their frequency of engaging in two preventive practices related to COVID-19. Specifically, participants were asked to rate how often at work in the past month they: 1) kept six feet social distance from people, and 2) wore a face covering. Response choices for each question was on a scale of 0=never, 1=seldom, 2=occasionally, and 3=very often.

3.5 Data Analysis

Because this study was based on a convenience sample, no pre-determined study size was calculated. A

total of 487 participants initially responded to the survey of which 279 (57.3%) provided complete responses to the main outcome variables. Of these responses, less than 10% had missing values on any one variable, thus mean (for continuous variables) or modal (for categorical variables) replacements were made. To examine the associations between the HBM, PMT, and TPB measures and preventive practices, we conducted a series of separate hierarchical regression analyses. In the first step of each model, we included the variables associated with the subscales of the specific theoretical framework to assess the association with preventive measures. In the next step of the analyses for both the PMT and TPB, we included the intention to perform the behavior as a potential mediator of the relationship between the behavior and the subscales, based on theoretical considerations for these models. In the next step, we included demographic variables, and in the final step, we included work related variables. Adjusted R^2 s and associated F-statistics were used to determine the model fit for each step of the analysis. For all analyses, an alpha level of $p \leq 0.05$ was used to indicate significant findings.

4 Result

4.1 Sample Characteristics

Participants were mostly female (79.9%), 36 years of age or older (54.8%), and identified as white Non-Hispanic (93.9%) and heterosexual (90.3%). The majority were married or widowed (58.1%), college graduates or postgraduates (90.7%), clinical nurses (52.3%), working on the day shift (80.3%), and had 5 years or greater of work experience (63.0%) (Table 1).

4.2 Associations between HBM Model Measures and Preventive Practices

In the first step of the hierarchical regression analysis examining the associations between HBM measures and frequency of physical distancing, a well-fitting model was obtained ($F[df=6,272]=3.6, p=0.002$) that explained 5% in the variance of the model.

Table 1 Demographic characteristics of sample (N = 279)

Demographic characteristics	N	%	Demographic characteristics	N	%
Gender			Grade in School		
Female	223	79.9	Some College*	26	9.3
Male	56	20.1	College Graduate	159	57.0
Sexual Orientation			Postgraduate	94	33.7
Non-heterosexual	27	9.7	Professional Role		
Heterosexual	252	90.3	Advance Practice/Pharmacy	11	3.9
Age			Clinical Nurse	146	52.3
18 to 25 years	41	14.7	Counselors (Psychology/Social Work)	10	3.6
26 to 35 years	85	30.5	Nursing Assistant/Paramedics	41	14.7
36 to 50 years	100	25.8	Therapists (e.g., Occupational, Respiratory, Physical, Diagnostics, Dietetics)	18	6.5
51 or older	53	19.0	Other (e.g., Administrative Staff, Information Technology)	53	19.0
Ethnicity			Disciplinary Tenure		
Non-white	17	6.1	1 year or less	25	8.9
White	262	93.9	> 1 to 5 years	78	28.0
Marital Status			> 5 to 10 years	52	18.6
Married/Widowed	162	58.1	> 10 years	124	44.4
Unmarried but Cohabiting	30	10.8	Shift Work		
Divorced/Separated	15	5.4	Days	224	80.3
Single, Never Married	72	25.8	Nights	43	15.4
			Other	12	4.3

*Note 1 individual had a Highschool degree and was included with some college category

In this step, only cues to action was associated with physical distancing. The addition of demographic variables in the second step improved the model fit ($F[df=15,263]=4.0, p<0.0001$), explaining 14% of the variance in the model. In this step, among demographic variables, older age was associated with physical distancing. In the final step, by including work-related variables, there was a further improvement in the model fit (adjusted $R^2=0.24, F[df=18,260]=4.5, p<0.0001$) and perceived severity, perceived benefits, older age, and not being a clinical nurse were significantly associated with a higher frequency of adhering to physical distancing (Table 2).

In the analysis of the associations between the HBM measures and frequency of face covering, poor fitting models were obtained. In the final step (adjusted $R^2=0.00, F[df=18,260]=1.0, p=0.444$), being a clinical nurse was associated with the outcome (Table 2). In this model, none of the HBM measures were associated with the frequency of face covering.

4.3 Associations between PMT Model Measures and Preventive Practices

In the first step of the analysis examining the associations between PMT model measures and frequency of physical distancing, a well-fitting model was obtained ($F[df=8,270]=5.4, p<0.0001$) that explained 11% in the variance of the model. In this step, perceived severity, perceived vulnerability, and response efficacy were significantly associated with physical distancing. The addition of intention in the second step did not significantly contribute to the model. However, adding demographic variables in the third step improved the model fit (adjusted $R^2=0.16, F[df=18,260]=4.0, p<0.0001$), and older age was associated with physical distancing. In the final step, by including work-related variables, there was a further improvement in the model fit (adjusted $R^2=0.19, F[df=21,257]=4.2, p<0.0001$) in which perceived severity, response efficacy, older age, and not being a clinical nurse were significantly associated with a higher frequency of adhering to physical distancing (Table 3).

In the analysis examining the associations between the PMT model measures and frequency of face covering, a well-fitting model was obtained in the first step (adjusted $R^2=0.03, F[df=8,270]=2.2, p=0.027$) in

Table 2 Hierarchical linear regression assessing the association between the HBM model measures, demographic, and work-related variables and preventive practices

Variables in hierarchical linear regression analysis	Physical Distancing ^a				Face Covering ^a			
	Beta	Estimate	S.E.	p	Beta	Estimate	S.E.	p
Step 1: HBM	Step 1: Adjusted R²=0.07, F=3.60, p=0.002				Step 1: Adjusted R²=-0.01, F=0.66, p=0.684			
Perceived Susceptibility	-0.04	-0.02	0.03	0.619	0.02	0.01	0.02	0.728
Perceived Severity	0.14	0.06	0.03	0.028	0.04	0.01	0.02	0.608
Perceived Benefits	0.13	0.08	0.04	0.035	0.06	0.02	0.02	0.396
Perceived Barriers	-0.03	-0.02	0.03	0.596	0.00	0.00	0.02	0.951
Cues to action	0.07	0.04	0.04	0.229	0.05	0.02	0.02	0.430
Perceived Self-Efficacy	0.04	0.02	0.04	0.544	0.03	0.01	0.02	0.660
Step 2: Demographics	Step 2: Adjusted R²=0.19, F=4.03, p<<0.0001				Step 2: Adjusted R²=-0.01, F=0.81, p=0.672			
Female (ref. Male)	-0.06	-0.15	0.15	0.336	-0.06	-0.09	0.09	0.357
Non-heterosexual (ref. Heterosexual)	-0.08	-0.27	0.19	0.165	-0.03	-0.06	0.12	0.641
26 to 35 years (ref. 18-25)	0.08	0.18	0.20	0.351	0.01	0.01	0.12	0.948
36 to 50 years (ref. 18-25)	0.23	0.49	0.23	0.037	0.02	0.02	0.14	0.859
51 or older (ref. 18-25)	0.26	0.69	0.26	0.008	-0.03	-0.03	0.16	0.774
White (ref. Non-white)	-0.01	-0.05	0.25	0.842	-0.00	-0.00	0.15	0.978
Single, Never Married (ref. other)	0.04	0.10	0.15	0.842	0.09	0.09	0.09	0.215
College Graduate (ref. some college)	0.13	0.27	0.22	0.224	0.01	0.01	0.14	0.945
Postgraduate (ref. some college)	0.11	0.25	0.23	0.283	0.00	0.00	0.14	0.980
Step 3: Work-related variables	Step 3: Adjusted R²=0.24, F=4.51, p<<0.0001				Step 3: Adjusted R²=0.00, F=1.01, p=0.444			
Clinical Nurse (ref. other)	-0.23	-0.46	0.14	<0.0001	0.18	0.18	0.08	0.015
Work tenure in years	0.12	0.08	0.05	0.108	0.00	0.00	0.03	0.970
Day shift (ref. other)	0.08	0.21	0.15	0.150	0.02	0.02	0.09	0.797

HBM = Health Belief Model

^a The analysis results represents the final analysis results after the third step of the hierarchical regression analysis.

Table 3 Hierarchical linear regression assessing the association between the PMT model measures, demographic, and work-related variables and preventive practices

Variables in hierarchical linear regression analysis	Physical Distancing ^a				Face Covering ^a			
	Beta	Estimate	S.E.	p	Beta	Estimate	S.E.	p
Step 1: PMT	Step 1: Adjusted R²=0.11, F=5.44, p<<0.0001				Step 1: Adjusted R²=-0.03, F=2.21, p=0.027			
Perceived Severity	0.17	0.07	0.03	0.021	-0.06	-0.01	0.02	0.467
Perceived Vulnerability	-0.13	-0.05	0.03	0.095	0.17	0.04	0.02	0.032
Fear Arousal	0.10	0.04	0.03	0.209	0.06	0.01	0.02	0.452
Intrinsic Reward	-0.01	-0.00	0.03	0.925	0.07	0.02	0.02	0.345
Extrinsic Reward	0.06	0.03	0.03	0.344	0.14	0.03	0.02	0.046
Response Efficacy	0.17	0.08	0.03	0.010	0.02	0.01	0.02	0.737
Perceived Self-Efficacy	0.05	0.03	0.04	0.371	0.02	0.01	0.02	0.702
Response Cost	0.02	0.01	0.03	0.782	-0.03	-0.01	0.02	0.652
Step 2: Intention	Step 2: Adjusted R²=0.11, F=4.91, p<<0.0001				Step 2: Adjusted R²=-0.05, F=2.72, p=0.005			
Intention	-0.01	-0.01	0.06	0.935	0.17	0.10	0.04	0.009
Step 3: Demographics	Step 3: Adjusted R²=0.16, F=3.97, p<<0.0001				Step 3: Adjusted R²=-0.05, F=1.81, p=0.025			
Female (ref. Male)	-0.03	-0.07	0.15	0.650	-0.04	-0.05	0.09	0.557
White (ref. Non-white)	-0.01	-0.04	0.25	0.867	-0.03	-0.06	0.15	0.665
Non-heterosexual (ref. Heterosexual)	-0.08	-0.28	0.19	0.153	0.01	0.02	0.11	0.892
Single, Never Married (ref. other)	0.04	0.10	0.15	0.505	0.11	0.15	0.09	0.094
26 to 35 years (ref. 18-25)	0.13	0.30	0.20	0.140	-0.02	-0.02	0.12	0.862
36 to 50 years (ref. 18-25)	0.22	0.48	0.24	0.048	0.00	0.00	0.14	0.996
51 or older (ref. 18-25)	0.24	0.63	0.27	0.018	-0.03	-0.05	0.16	0.766
College Graduate (ref. some college)	0.12	0.25	0.22	0.262	0.00	0.00	0.13	0.987
Postgraduate (ref. some college)	0.14	0.29	0.23	0.200	-0.01	-0.01	0.14	0.919
Step 4: Work-related variables	Step 4: Adjusted R²=0.19, F=4.164, p<<0.0001				Step 4: Adjusted R²=0.08, F=2.09, p=0.004			
Clinical Nurse (ref. other)	-0.20	-0.41	0.14	0.003	0.23	0.26	0.08	0.001
Work tenure in years	0.09	0.06	0.05	0.246	0.01	0.01	0.03	0.881
Day shift (ref. other)	0.08	0.19	0.15	0.192	0.03	0.04	0.09	0.641

PMT = Protection Motivation Theory

^a The analysis results represents the final analysis results after the third step of the hierarchical regression analysis.

which perceived vulnerability was significantly associated with the outcome. Adding intention in the second step slightly improved the model fit (adjusted $R^2=0.05$, $F[df=9,269]=2.7$, $p=0.005$) and perceived vulnerability and intention remained significantly associated with a higher frequency of face covering. In the third step, the addition of demographic variables did not significantly improve the model, with no demographic variables associated with the outcome. In the final step, by adding work-related variables, a well-fitting model was obtained (adjusted $R^2=0.08$, $F[df=21,257]=2.1$, $p=0.004$), in which perceived vulnerability, extrinsic reward, intention, and being a clinical nurse were significantly associated with higher frequency of face covering.

4.4 Associations between TPB Model Measures and Preventive Practices

In the first step of the hierarchical regression analysis examining the associations between TPB model measures and frequency of physical distancing, a well-fitting model was obtained (adjusted $R^2=0.07$, $F[df=3,275]=8.1$, $p<0.0001$) in which both attitudes and perceived behavioral control were associated with the

outcome. The addition of intention in the second step did not significantly contribute to the model. Adding demographic variables in the third step improved the model fit (adjusted $R^2=0.14$, $F[df=13,265]=4.5$, $p<0.0001$), in which older age was associated with physical distancing. Including work-related variables in the final step resulted in a well-fitting model (adjusted $R^2=0.17$, $F[df=16,262]=4.5$, $p<0.0001$) in which only older age and not being a clinical nurse were significantly associated with a higher frequency of adhering to physical distancing (Table 4).

In the analysis of the association between the TPB model measures and frequency of face covering, subjective norms were associated with the outcome in the first step. The additions of intention in the second step and demographics in the third step did not significantly improve the model. In the final step, the addition of work-related variables produced a well-fitting model (adjusted $R^2=0.05$, $F[df=16,262]=1.9$, $p=0.019$), in which being a clinical nurse was the only variable significantly associated with higher frequency of face covering.

Table 4 Hierarchical linear regression assessing the association between the TPB model measures, demographic, and work-related variables and preventive practices

Variables in hierarchical linear regression analysis	Physical Distancing ^a				Face Covering ^a			
	Beta	Estimate	S.E.	p	Beta	Estimate	S.E.	p
Step 1: TPB	Step 1: Adjusted $R^2=0.07$, $F=8.07$, $p<0.0001$				Step 1: Adjusted $R^2=0.03$, $F=3.59$, $p=0.014$			
Attitude	0.12	0.12	0.07	0.088	0.10	0.05	0.04	0.215
Subjective Norms	0.13	0.11	0.08	0.157	0.05	0.02	0.05	0.642
Perceived Behavioral Control	0.05	0.03	0.04	0.471	-0.05	-0.02	0.02	0.442
Step 2: Intention	Step 2: Adjusted $R^2=0.07$, $F=6.09$, $p<0.0001$				Step 2: Adjusted $R^2=0.094$, $F=3.59$, $p=0.007$			
Intention	-0.09	-0.09	0.08	0.272	0.15	0.09	0.05	0.080
Step 3: Demographics	Step 3: Adjusted $R^2=0.14$, $F=4.50$, $p<0.0001$				Step 3: Adjusted $R^2=0.03$, $F=1.66$, $p=0.071$			
Female (ref. Male)	-0.05	-0.12	0.15	0.415	-0.04	-0.06	0.09	0.492
White (ref. Non-white)	0.01	0.06	0.25	0.825	-0.00	-0.00	0.15	0.982
Non-heterosexual (ref. Heterosexual)	-0.06	-0.21	0.20	0.286	-0.01	-0.02	0.12	0.866
Single, Never Married (ref. other)	0.04	0.10	0.15	0.509	0.09	0.11	0.09	0.210
26 to 35 years (ref. 18-25)	0.09	0.20	0.20	0.328	-0.02	-0.02	0.12	0.840
36 to 50 years (ref. 18-25)	0.22	0.48	0.24	0.046	-0.01	-0.01	0.14	0.927
51 or older (ref. 18-25)	0.24	0.63	0.26	0.017	-0.06	-0.09	0.16	0.584
College Graduate (ref. some college)	0.07	0.15	0.22	0.500	-0.03	-0.04	0.13	0.766
Postgraduate (ref. some college)	0.10	0.22	0.23	0.336	-0.03	-0.03	0.14	0.807
Step 4: Work-related variables	Step 4: Adjusted $R^2=0.17$, $F=4.51$, $p<0.0001$				Step 4: Adjusted $R^2=0.05$, $F=1.91$, $p=0.019$			
Clinical Nurse (ref. other)	-0.17	-0.35	0.14	0.010	0.21	0.24	0.08	0.004
Work tenure in years	0.11	0.08	0.05	0.144	-0.01	-0.00	0.03	0.924
Day shift (ref. other)	0.08	0.21	0.15	0.171	0.02	0.02	0.09	0.784

TPB = Theory of Planned Behavior

^aThe analysis results represents the final analysis results after the third step of the hierarchical regression analysis.

5 Discussion

Our study of the responses of clinical hospital staff found that not all measures based on theoretically derived models of behavior change were associated with the use of preventive practices in the early stages of the COVID-19 pandemic in the U.S. Our results indicated that although no full model measures were associated with specific preventive practices, some model measures had stronger correlations than others. These findings may provide a basis for future research and may support the adoption of preventive practices in healthcare settings.

Our first aim was to assess whether the HBM model measures would be associated with the frequency of preventive practices. We found that both perceived severity and perceived benefits were associated with physical distancing, but no measure was associated with face covering. Other population-level studies investigating the HBM in relation to COVID-19 preventive behaviors have found that perceived susceptibility, benefits, barriers, cues to action, and self-efficacy are associated with preventive practices (Adesina et al., 2021; Bechard et al., 2021; Karimy et al., 2021; Shitu et al., 2022). However, in each investigation, preventive behaviors are measured quite differently. It is possible that the poor associations between the HBM measures and preventive behaviors in our present study is an indication of the novelty of healthcare workers response to the COVID-19 pandemic. Another reason may be that healthcare workers may have had reasons other than the measures of the HBM in adopting the preventive practices. In other words, the HBM may not be the best model predicting individual preventive practice adoption (i.e., social distancing vs. hand washing vs. face covering) as has been noted by others (Guidry et al., 2021). However, the fact that perceived severity and benefits were associated with physical distancing suggests that providing information on the severity of disease outcomes and the benefits of

prevention may increase healthcare workers' adoption of some preventive practices. Future mixed-methods studies may be needed to further understand the salience of HBM measures among healthcare workers.

Our second aim was to examine how measures derived from the PMT were associated with preventive practices. When controlling for demographic and work-related variables, we found that perceived severity and response efficacy were directly associated with physical distancing, whereas perceived vulnerability, extrinsic reward, and intentions to engage in preventive practices were associated with face covering. Few studies have examined the PMT in relation to COVID-19 preventive practices among healthcare workers. A recent survey among healthcare workers in Iran found that the threat appraisal components (i.e., perceived severity and vulnerability) of the PMT had a higher predictive ability than the coping appraisal (i.e., response efficacy and self-efficacy) in association with behavioral intention (Bashirian et al., 2020). Contrary to our findings, another recent survey among healthcare workers in Saudi Arabia found that self-efficacy was the highest predictor of preventive practices (Mortada et al., 2021). Future studies are needed to examine why the PMT model measures vary in their predictive ability in relation to healthcare workers' adoption of different preventive practices.

Our third aim was to examine the association between TPB model measures and preventive practices. In the initial steps of the hierarchical regression analysis, both attitudes and perceived behavioral control were associated with the frequency of adopting physical distancing, however, this relationship was completely mediated by adding demographic and work-related variables to the analysis. No measure was associated with face covering. A recent study of the TPB model in relation to COVID-19 preventive practices found that the measures of the model were predictive of both behavioral intention and actual social distancing

behavior (Gibson et al., 2021). Another population-based study in the U.S. found that each of the TPB measures were associated with both physical distancing and face coverings (Aschwanden et al., 2021); however, for physical distancing, the strongest predictor was attitudes and for face covering, the strongest predictor was perceived behavioral control. Given these divergent findings in the literature, future studies of healthcare workers are needed to fully understand the potential contribution of the TPB in understanding preventive practices.

Finally, irrespective of theoretically derived model measures, there were salient demographic and work-related variables associated with the frequency of preventive practices. Specifically, older age was associated with a greater frequency of physical distancing in each model. Compared to other discipline groups, being a clinical nurse was associated with greater frequency of face covering but lower frequency of physical distancing. Older age among healthcare workers has been found to be a consistent factor in adopting COVID-19 preventive practices (Olum et al., 2020; Tien et al., 2021; Walle et al., 2021). Our findings that clinical nurses were more likely to use face covering but less likely to maintain physical distancing compared to other healthcare workers may reflect the specific duty of nurses in the hospital. Because clinical nurses are more involved in direct patient care, they may be unable to maintain physical distancing but more likely to face cover. This finding demonstrates that in some instances, preventive measures cannot be maintained because of the nature of job duties for clinical nurses. On the other hand, this finding also provides some evidence for the increased risk and vulnerability that nurses may face during infectious disease outbreaks. Regardless of internal motivations to avoid infection, the nature of a nurse's job may prevent them from adhering to some preventive practices.

5.1 Implications for Nursing Research and Practice

Since 52.3% of our sample were clinical nurses, the study findings may have specific implications for nursing practice and research. First, we found that the HBM factors associated with preventive practices (i.e., physical distancing) were perceived severity and benefits. In relation to nurses, this finding suggests that it is important to provide information on the severity of disease outcomes and the benefits of adopting preventive measures to reduce risk of exposure and infection. However, nursing research, employing mixed-methods, may further examine nurses perceptions of severity and benefits to better understand how the HBM measures may be used to support preventive practices in nurses.

Second, when examining factors associated with preventive practice adoption using the PMT, we found that perceived severity and response efficacy were associated with physical distancing, and that perceived vulnerability, extrinsic reward, and intentions to engage in preventive practices were associated with face coverings. This finding suggests that there are different motivations for the adoption of different aspects of preventive practices. Perhaps it is important to consider different types of education and awareness related to the type of preventive practices being recommended for adoption. For example, when recommending physical distancing among nurses, emphasis should be placed on issues related to the severity of infection and the efficacy of responding to preventive measures. Whereas, when recommending face coverings, the educational emphasis should be on promoting awareness of vulnerability, the extrinsic rewards of adopting the behavior, and ways to increase intentions to adopt the behavior. Nonetheless, future targeted studies with nurses are needed to examine how the PMT constructs may affect their adoption of preventive practices in other infectious disease areas.

Third, because the TPB model constructs were completely mediated by demographic variables, it may

be implied that attitudinal, subjective norm, and perceived behavioral control aspects that are associated with preventive practices adoption are explained through other variables. The finding that older age was associated with a greater frequency of physical distancing suggests that younger nurses may either perceive the risk of physical contact as low or have lower risk aversion in being infected by COVID-19 as has been observed in other studies (Wolfe et al., 2021). In addition, clinical nurses, compared to other health provider groups, were more likely to adopt face covering but less likely to use physical distancing. This finding may be reflective of institutional policies regarding using face coverings and face masks which is more normative among clinical nurses, whereas the nature of their job in caring for patients prevents them from maintaining physical distancing. Future studies would be needed to better understand clinical nurses' views on preventive policies in relation to their job responsibilities to better guide infectious disease prevention practice.

5.2 Limitations

A few important limitations must be considered in interpreting the findings of this study. First, although the measures used in our study were adapted from prior studies, their reliability estimates ranged from poor to acceptable for the HBM, PMT, and TPB measures. This challenge is due to the timing of the data collection. The study was designed at the initial stages of the COVID-19 pandemic in the U.S. and at that time no reliable or valid measures of preventive practices or methods to assess COVID-19 risk had been developed. For the preventive practices measure we used a perceived frequency measure which has not been previously validated. Poor reliability can affect the internal validity of the study such that some of the findings may have been a result of challenges in measuring the theoretical model under study. Future studies should select other question formats to better determine the measures under

study.

Second, since based on a cross-sectional analysis, our study findings can only be understood within the time point of the data collection. No causal inferences can be made from the data. Thus, it is possible that the responses of participants could change over time based upon the development of the COVID-19 pandemic, especially as new information on preventive practices was made available. Future studies with longitudinal designs could be used to strengthen the predictive ability of the measures under study in relation to the main outcomes.

Third, the survey respondents were derived from a convenience sample of healthcare workers in an academic-medical center. The non-random sampling method of data collection limits the generalizability of findings to all the healthcare workers in the setting. Moreover, since the study sample was based on one main setting, our findings cannot be generalized to healthcare workers beyond the study context. Future studies including healthcare workers across multiple settings can strengthen the generalizability of such findings.

Fourth the exploratory models generated by our regression analyses have low explanatory power for the relationship between variables. This means that there are other potential variables, not included in the study, which may better explain the reasons why participants adopted preventive practices. Such variables may have included internal hospital-based policies or external governmental regulations. Thus, at best, participants' responses to the theory-based survey measures may indicate their individual perspectives and motivations and may not necessarily fully capture the reasons for their actual adoption of preventive behaviors.

6 Conclusion

The main deductions from our study are that the theoretically derived measures based on the HBM and

PMT contributed some explanatory power to understand healthcare workers' perceived frequency in adopting two different preventive practices (i.e., physical distancing and face covering), but the TPB did not. These findings suggest that healthcare workers may have different risk appraisals based on specific preventive practices. For example, whereas physical distancing may be associated with perceived severity of contracting COVID-19, face covering may not be met with the same risk appraisal. Such differences in risk appraisals based on different preventive practices may need to be further explored. This is especially salient given that our study findings reflect data from healthcare providers during the height of the COVID-19 pandemic. However, our exploration of such differences may improve our ability to tailor health risk communications to nurses and other healthcare workers to support preventive practice adoptions in future public health emergencies related to infectious disease processes. However, given the limitations in the design of our study, further longitudinal and experimental studies are needed, using theoretically derived measures, to determine optimal methods to support preventive practice adoption by healthcare workers during novel infectious disease outbreaks.

Other Author Footnotes

C. Okoli conceptualized the study, worked on data analysis, drafted the results section, and reviewed sections of the paper. Z. Almogheer, S. Seng, B. Abufarsakh, and W. Xie assisted in drafting the introduction, methods, and discussion section of the manuscript. All authors hold themselves jointly to the content in the manuscript.

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Conflicts of Interest

The authors have no conflict of interest to declare. There was no funding associated with the current study.

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Appendix A Health Belief Model questions and internal consistency reliability estimates

Scale	Item	Mean (SD)	Cronbach's alpha
Perceived	My risk for getting COVID-19 will likely get worse in the future	6.25 (2.72)	0.57
Susceptibility	I've heard healthcare workers should get tested for COVID-19	6.38 (3.37)	
	Caring for people who are sick increases my exposure to COVID-19	7.79 (2.75)	
Perceived	Having COVID-19 could lead to severely compromised lungs	7.71 (2.65)	0.74
Severity	Getting COVID-19 can lead to premature death	7.71 (2.82)	
Perceived	The benefits of preventing COVID-19 infection would outweigh the costs	7.49 (2.89)	0.47
Benefits	I would be healthy if I didn't get COVID-19	7.23 (2.94)	
	I can continue working if I don't get COVID-19	9.27 (1.78)	
Perceived	Practicing preventative measures (i.e., washing hands, wearing masks, social distancing, and wiping down work areas) is inconvenient	2.89 (2.97)	0.58
Barriers	Practicing preventative measures (i.e., washing hands, wearing masks, social distancing, and wiping down work areas) doesn't work well against COVID-19	1.57 (2.42)	
	Practicing preventative measures (i.e., washing hands, wearing masks, social distancing, and wiping down work areas) is not supported at work	1.44 (2.49)	
Cues to	I have heard good things about practicing preventative measures (i.e., washing hands, wearing masks, social distancing, and wiping down work areas) to prevent COVID-19	8.43 (2.19)	0.69
Action	I know what to do to prevent COVID-19 transmission	8.83 (1.70)	
Perceived	It would be difficult to practice preventative measures against COVID-19 (i.e., washing hands, wearing masks, social distancing, and wiping down work areas)	3.11 (3.12)	0.71
Self-Efficacy	Practicing preventative measures for COVID-19 (i.e., washing hands, wearing masks, social distancing, and wiping down work areas) is easy	3.96 (3.08)	
HBM Total	All questions	103.21 (16.33)	0.62

Appendix B Protection Motivation Theory questions and internal consistency reliability estimates

Scale	Item	Mean (SD)	Cronbach's alpha
Perceived	Having COVID-19 could lead to severely compromised lungs	7.71 (2.65)	0.74
Severity	Getting COVID-19 can lead to premature death	7.71 (2.82)	
Vulnerability	It is possible that I will get COVID-19 at work	8.05 (2.56)	0.81
	Working at the hospital increases my risk for getting COVID-19	7.74 (2.66)	
Intrinsic	I enjoy working in the hospital despite my risk of exposure to COVID-19	7.47 (2.68)	0.76
Reward	I would miss my time at work if I had to stop working due to the risk of exposure to COVID-19	6.91 (2.95)	
Extrinsic	In spite of the risk of exposure to COVID-19, working at the hospital is my duty to patients as a health care worker	8.22 (2.50)	0.85
Reward	In spite of the risk of exposure to COVID-19, continuing to work at the hospital is important to support my co-workers	8.14 (2.56)	
Fear arousal	The thought of getting COVID-19 makes me very anxious	5.33 (3.23)	0.78
	If my family member was infected with COVID-19, I would be very concerned	8.42 (2.45)	
	I'm worried about the possibility of inadvertently infecting others with COVID-19	7.25 (3.08)	
Response	I can greatly minimize my exposure to COVID-19 by using preventative measures (i.e., washing hands, wearing masks, social distancing, and wiping down work areas) at work	8.09 (2.37)	0.86
Efficacy	I can prevent exposing others with COVID-19 if I practice preventative measures (i.e., washing hands, wearing masks, social distancing, and wiping down work areas) at work	8.02 (2.17)	
Perceived	It would be difficult to practice preventative measures against COVID-19 (i.e., washing hands, wearing masks, social distancing, and wiping down work areas)	3.11 (3.12)	0.71
Self-Efficacy	Practicing preventative measures for COVID-19 (i.e., washing hands, wearing masks, social distancing, and wiping down work areas) is easy	3.96 (3.08)	
Response	Practicing preventative measures (i.e., washing hands, wearing masks, social distancing, and wiping down work areas) at work makes people think you are overreacting against COVID-19	2.74 (2.78)	0.66
Cost	Practicing preventative measures (e.g., wearing masks, social distancing) at work may cause patients to be upset with us	2.80 (2.91)	
PMT	I expect to practice preventative measures (e.g. washing hands, wearing masks, social distancing, and wiping down work areas) at work in the next 3 months.	6.66 (0.95)	0.89
intention	I intend to practice preventative measures (e.g. washing hands, wearing masks, social distancing, and wiping down work areas) at work in the next 3 months.	6.48 (1.13)	
PMT total	All questions	124.83 (18.59)	0.66

Appendix C Theory of Planned Behavior questions and internal consistency reliability estimates

Scale	Item	Mean (SD)	Cronbach's alpha
Attitudes	On a scale of 1 being 'harmful' and 7 being 'beneficial' how would you rate practicing preventative measures (e.g. washing hands, wearing masks, social distancing, and wiping down work areas) at work for the next 3 months.	6.40 (1.04)	0.88
	On a scale of 1 being 'bad' and 7 being 'good' how would you rate practicing preventative measures (e.g. washing hands, wearing masks, social distancing, and wiping down work areas) at work for the next 3 months.	6.19 (1.26)	
	On a scale of 1 being 'worthless' and 7 being 'useful' how would you rate practicing preventative measures (e.g. washing hands, wearing masks, social distancing, and wiping down work areas) at work for the next 3 months.	6.08 (1.29)	
Subjective Norms	People who are important to me want me to practice preventative measures at work for the next 3 months.	6.18 (1.47)	0.78
	It is expected of me that I practice preventative measures at work for the next 3 months.	6.44 (1.22)	
	Most of my peers think it is important to practice preventative measures at work for the next 3 months.	5.59 (1.63)	
Perceived Behavioral Control	I am confident that I can practice preventative measures at work for the next 3 months.	6.15 (1.38)	0.62
	The decision to practice preventative at work for the next 3 months is in my control	5.01 (1.71)	
	Whether I practice preventative measures at work for the next 3 months is in entirely up to me	4.25 (2.37)	
Intention	I expect to practice preventative measures (e.g. washing hands, wearing masks, social distancing, and wiping down work areas) at work in the next 3 months.	6.66 (0.95)	0.89
	I intend to practice preventative measures (e.g. washing hands, wearing masks, social distancing, and wiping down work areas) at work in the next 3 months.	6.48 (1.13)	
TPB	All items	65.43 (10.66)	0.88

校友訪談 Interviews with Alumni

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承百載春風化雨
傳鏡湖仁愛關懷



「我和護理相互成就」——訪談資深護理前輩梁玉華校友

毛愛妹^{1*} 祁璐¹

【摘要】 本文出自人物訪談。作者採訪了澳門護理界知名前輩以及澳門鏡湖護理學院校友—梁玉華（華姐）。訪談內容涉及華姐幾十年工作經歷，包括在臨床工作期間作為醫療人員的服務經歷，以及退休後的社區服務經歷。文章採用事例結合觀點的寫作手法，清晰刻畫了華姐服務病人、服務社會的多種角色身份，闡述了華姐對護理的看法，以及她對於護理人員作為服務者服務病人和社會的本質的理解。

【關鍵詞】 專業發展 護士 護理 校友 訪談

“While I Take on Nursing Profession, Nursing Makes Me the One I Am”: An Interview with Iok Wa Leong, the Alumna of Kiang Wu Nursing College of Macau

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[Abstract] This article is developed from an interview with a locally well-known nurse in Macau: Iok Wa Leong, an alumna of Kiang Wu Nursing College of Macau. The interview covered a range of topics concerning Leong's decades-long career as a nurse, including her services in a hospital and the services in the communities after she retired. Results were presented by a combination of events encountered by Leong and her interpretations. Her story depicted her multiple roles for patients in hospitals and community residents. Leong also provided her perspectives on nurses and nursing. Particularly, she emphasized her role as a service provider.

[Key Words] professional development nurse nursing alumna interview

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梁玉華

1 前言

梁玉華，人們親切地稱呼她「華姐」，是澳門鏡湖護理學院（前稱鏡湖護士助產學校）第 37 屆畢業生（1970 年畢業）。畢業後任職於鏡湖醫院，從事臨床護理和醫院管理工作，亦參與專業團體、參政議政，為護理專業和市民大眾發聲。她曾任澳門特別行政區第二、三屆立法會議員、澳門特別行政區第十一、十二屆全國人大代表、澳門工會聯合總會（工聯）副會長、監事長、中華護理學會理事、澳門婦女聯合總會理事，曾獲得前澳葡當局頒發專業功績勳章、澳門特區政府仁愛功績勳章。現任澳門護士學會副會長、澳門工聯顧問、澳門婦女聯合總會顧問、鏡湖醫院名譽顧問、澳門鏡湖護理學院顧問、第五屆醫務委員會委員（護理專業）和澳門公務人員投訴處理管理委員會主席。華姐精力充沛，仍活躍於澳門護理和社會活動場所。是什麼信念支撐華姐仍在奉獻？華姐自己如何看待數十年職業生涯？如何看待社會服務和參政與護理的關係？帶著這些疑問，我們在 2023 年 10 月某個天高氣爽的日子，在華姐的母校——澳門鏡湖護理學院採訪了她。期望華姐豐富的人生經歷對年輕護士專業成長有所啟示。

2 職業生涯速描

由于家庭貧困，華姐初中畢業就選擇升讀鏡湖護士助產學校（護校），因為當時護校是醫院辦校，不僅不收學費，還給一定的生活費，那一年華姐 16 歲。學習期間華姐先在鏡湖醫院各科實習，印象最深刻的是產科及手術室實習。1970 年畢業後華姐就一直在鏡湖醫院工作 42 年，其中在手術室工作 20

多年，門急診 20 多年。期間曾擔任過手術室護士、麻醉師、護士長工作。後來因護校需要老師，被調到了護校當班主任老師，一年半之後又回到手術室繼續擔任麻醉師。後來澳葡當局對醫護人員資質有新的規定，華姐由麻醉師回歸護理，被調到了門急診當護士長、護理督導，之後晉升為門急診副主任和主任，到退休年齡後離開鏡湖醫院。但她退而不休，繼續在不同平台為澳門醫療事業做貢獻。

3 職業生涯特點

3.1 求學若渴，學無止境

華姐整個職業生涯就是學習過程。從護校畢業後多年來一直學習，她學習英文、葡文，積極參加鏡湖醫院提供的進修課程，曾經被鏡湖醫院派到香港進修學習手術室和急診分流管理，學習歸來她協助成立急診科、分流站、呼吸重症監護室。她在 40 多歲時被派到葡國進修一年，觀察學習葡國的急診、社區護理、搶救中心等。

為提升澳門護理人員學歷，華姐與澳門護士學會理監事們，努力尋求進修渠道，通過工聯業餘進修中心協助，與暨南大學開辦護理大專課程，提供澳門護士學習機會。雖然利用自己休息時間學習，但護士們熱情高漲，踴躍報名，原本計劃招生一班 40 多名學生，後來一班 80 人修讀，大家都很努力學習，沒人退出課程。華姐本人也參加了這個課程。同時間醫院也安排香港理工學院（現香港理工大學）提供護理文憑進修課程，供鏡湖和仁伯爵兩家醫院的護理人員就讀，為英文授課。那段時間華姐同時參加兩個課程的學習，學習任務繁重，每天只睡四個小時，坐在廁所都拿著書本來讀。香港理工的護理課程有來自港澳兩地 180 個學員，有 5 個優等畢業生，其中三人來自澳門，華姐是其中之一。她為自己的努力感到自豪！可見華姐是靠著勤奮、刻苦、以及不服輸的精神完成了很多課程。華姐對於讀書有自己的一些看法：

「人需要不斷學習，拓寬自己的眼光。」

「我們讀書不是為文憑，我們讀書是為了充實自己，更好地服務病人！」

華姐和護理有識之士在爭取學習機會的過程中，並非一帆風順。因為課程目標是使參加學習的護士

學歷由中專提升到大專，需要持續三年。考慮到護士輪班工作，為確保護士能夠參加課程，需要取得管理部門的支持。華姐和護士學會理事們拜訪當時的衛生司司長（即現在的局長）爭取支持，但司長最初告知她們並不會承認該課程，華姐和護士學會理事據理力爭，對司長說：

「我們是自發性地讀書，沒要求你承認我們什麼！但是我們真的要提升專業能力，因為社會進步，醫學科學也在進步，我們還是這樣的學歷是追不上（時代發展），服務不好市民的，所以我們要讀書！」

最終司長同意課程的開辦。華姐和護士學會終於為護士們爭取到了學歷提升的機會，為日後護理教育發展打下了良好的基礎。

3.2 矢志不渝，不忘初心

華姐曾有機會短暫接觸保險行業，業績突出，但她仍決定放棄這個兼職工作。她解釋說：

「我熱愛自己護理專業，我覺得我在這個專業有一個基礎，我做了這麼多年，我不想浪費，而且護理專業需要全身心投入。護士從事的是幫助人的專業，我享受幫人的感覺。保險只不過是我人生的一個歷練、一個機會，讓我開眼界。這一年從事保險學習到的很多，對我日後在醫院做管理工作很有幫助。」

華姐從葡國完成一年的進修學習回到澳門後，有傳言說華姐回來就不在鏡湖工作了，去衛生部門當公務員，華姐覺得傳言非常可笑，說：

「根本沒有這回事。醫院培養了我，我非常感恩！我要將我的所學回報醫院，更好地為病人服務。我要在鏡湖醫院服務直至退休！」

華姐對於澳門護理人員的流動有自己的看法，她說：

「人往高處走是應該的，每人都有個人目標。有同事從鏡湖去山頂，也有山頂同事去鏡湖，沒關係，人是流動的。有機會往上流，是應該鼓勵的。我現在經常跟同事說，流動沒關係，不要流失就行了。不管在哪個機構、哪個崗位，只要不忘初心，都是為病人服務！」

這就是華姐，對服務病人情有獨鍾，對鏡湖情有獨鍾，理性看待澳門護士在本地區不同醫療機構

之間的流動。

3.3 據理力爭 — 發出護士的聲音

華姐和澳門護理前輩認為，護理專業的提升以及護士的權益要靠自己去爭取。要有聯絡其它護理專業團體的渠道，向當局提供專業發展建議，就要成立護士自己的團體，依靠團體的力量爭取護理專業的發展。1986 年在護理前輩努力下，澳門護士學會成立。華姐也是創會理事。1990 年的時候，華姐成為護士學會副理事長，第二年成為理事長，藉助這個平台為護士發聲。她特別提到，護士學會為鏡湖護校的專業地位進行抗爭，起因是當時她和護校劉嘉寶老師二人打算報讀澳門衛生司技術學校的護理專科課程，但遭到了校長的拒絕：

「他就不准我們報讀，告訴我們：『法律不承認你們鏡湖護士助產學校（資格），所以你們不可以過來讀。』我就說：『如果因為學額都不夠你們自己（公立）醫院的人去讀，你不給非政府醫院的護士去讀，我完全理解；但是你說不認可我的學歷而不讓我讀，這意味著我們這麼多鏡湖護校畢業的人過去山頂是沒機會讀書，沒機會晉升，這個我是不容許的，我一定和你爭到底！』我們回到護士學會，大家商量，認為這樣不行，會扼殺了我們（鏡湖畢業生）的護理發展，其實澳門大部分的護士都是（鏡湖護校）這間學校畢業的。於是每天晚上 12 點後護士學會的幾個理事就去拜訪報館的總編輯。一些市民誤以為我們爭取學歷認可的最終目的是提升工資。經過報導我們爭取學歷認可的因由，市民理解了我們為專業發展、服務市民的初衷。由於每天都有我們爭取學歷認可的新聞報導，因此都能看到梁玉華（華姐）的樣子……1992 年被邀請加入同心協進會，為第三候選人，參加立法會選舉，雖未能入選成為議員，但來自護士的訴求得到同心協進會當選的兩位議員大力支持和推動。1994 年的時候，澳門政府通過第 5/94/M 號法令，承認鏡湖護士助產學校課程等同於官方所核准之一般護理課程，從而為鏡湖護理教育以及澳門護理專業進一步發展奠下良機。」

華姐本人再接再厲，於澳門回歸後再次參加立

法會選舉，成功當選第二和第三屆立法會議員，在立法會為澳門市民和護理人員發聲。

3.4 盡心盡責，受人喜愛

華姐擔任過多種角色，和很多人打過交道。華姐走到哪裡，在哪個崗位上都是盡心盡責，加之性格外向，和共事者和睦相處，遇事從他人角度出發，設身處地為他人著想，因此受到眾人喜愛。

華姐曾任鏡湖醫院門急診主任，在這個崗位做得得心應手，和大科主任關係都很好。鏡湖醫院有年度主任獎評活動，由全院的各科主任投票評選，華姐次次都是高分，位列前五名之內。她總結自己之所以受到大家肯定，在於她為自己作為服務者的定位：

「我就和大科主任說，我不是管你們的，我是來服務你們的！我在門急診是代表醫院服務你們，把環境做好給你們醫生看門診！所以我本著這個宗旨，和大科主任合作很愉快。其實醫生等於是我們的內顧客，他們要服務外顧客病人，我要服務好我們的內顧客。」

華姐參與立法會選舉的時候，許多曾經她護理過的病人也給她投了票，就連監獄裡的人也投華姐的票，華姐說可能是她服務過的病人。華姐贏得病人的信任也在於她盡心服務病人：

「當病人來的時候，我們不分種族，不分貧賤富貴，甚至那些很困難的，你更加要去幫助他們。其實你做什麼都是本著一個心態。這一刻他是病人，我要服務好他。」

3.5 心態積極，懷感恩之心

細數自己人生經歷，華姐用得比較多的詞是「開心」，她有從內透出的樂觀和自信。她正向看待生活中的每一個機遇、每一次變動，不生氣，不抱怨，從每一個經歷中去發現快樂之處，將每一個機遇看成豐富自己人生的機會。

華姐笑談自己剛工作時也想離開澳門去香港，因為那裡工資高於澳門。但自己暈車暈船特別厲害，去到香港面試前已經嘔吐到面無血色，因此決定留在澳門，留在鏡湖醫院，越做越喜愛自己在鏡湖醫院的工作。她不後悔沒有去香港，反而慶幸自己留在澳門，成就如今的自己。

華姐從鏡湖醫院手術室調入鏡湖護士助產學校

做老師的時候，也有閒言碎語，華姐認為要調整自己心態，正面看待工作調動：

「我自己的心態怎麼樣呢？我和別人說，我說你不要看輕自己，因為如果你覺得被人調走是很慘的話，你就真的很慘！但是你覺得這是光榮的事，你就會有更好的心態！你就做好老師的職責。」

在華姐看來，新的崗位帶來新的人生成長：

「我去做老師的時候，我要重新看理論，我要重新裝備，我覺得對自己真的是一個提升！」

華姐在退休後又加入澳門工聯，負責工聯的社會服務，其中主要是醫療服務管理，包含三間醫療所、一間日間康復中心、一個居家護理服務團隊和一間護養院。她對於由醫院轉向社區體會較深，因為隨著澳門人口的快速老齡化，社區醫療服務非常重要，能夠配合特區政府「預防優先」的醫療政策，但社區醫療資源非常缺乏。她有感於工聯醫護前輩為社區醫療服務的付出，在社區環境複雜且資源不足的情況下，急市民所需，創造條件，不斷完善、優化服務，充分體現始於足下的實幹主義精神。華姐致力於跟隨前輩的足跡，利用自己多年在醫院積累的工作經驗，與服務社區的同仁一起努力，不斷發展壯大社區服務力量，為社區居民，尤其是長者提供所需服務。

4 結語

華姐的職業生涯是忙碌而充實的，她擔任過多種社會角色，包括護士、麻醉師、護理教師、醫院管理者、立法會議員、澳區人大代表等，但始終秉持服務者的態度。她從來沒有動搖過對服務病人的堅守，在不同崗位上，在不同的平台，為澳門臨床護理、護理管理和護理教育做貢獻，為護士地位提升而努力。她幾十年孜孜不倦，不斷學習，在提高自己知識技能和管理水平的同時，將自身的職業發展融入推動澳門護理整體發展的大目標中。可以說，護理成就了現在的她，成為澳門社會有一定影響力的人士，她也推動了澳門護理事業進步。華姐對自己的人生軌跡是滿意的，而且仍在新的崗位上繼續為澳門醫療衛生事業做出貢獻。作為澳門鏡湖護理學院的校友，華姐對母校的發展充滿信心，她認為

鏡湖護理以及澳門護理一定會一代更比一代強：

「我很感恩自己從事護理專業，既作為謀生職業，更是幫助人的專業。只要自己不斷提升知識和技能，擁有關愛之心，就能幫助更多有需要的人，能幫到人是自己的福氣！這些都是母校傳承下來的傳統優良。我們來讀書的時候，前輩、老師就很講求以病人為中心這種精神，教育我們多關顧病人，我覺得母校現在的校訓『從人到仁』是『以病人為中心』理念的昇華！希望我們的師弟、師妹在這方面繼續加強，再加上他們聰明才智和現代資訊技術應用，一定會比我們優秀！母校在新的百年一定會發展得更好！澳門護理一定會發展得更好！」

鳴謝

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