Career Preferences among Nursing Students: A Cross-Sessional Study

Mei Hua Kerry Hsu, RN, MSN, EDD\textsuperscript{1}, Qian Hong Ye, MD, PhD\textsuperscript{1} and Man Ho Ling, PhD\textsuperscript{2}

Abstract

Introduction: It is estimated that more nurses are needed in the future, nursing students' career preferences are important to contribute to the shortage of nursing manpower in Macao. Little is known regarding the preferences for nursing students' career preferences and related factors among nursing students.

Objective: To explore and investigate the career preferences and related factors among nursing students in Macao.

Methods: A descriptive, cross-sectional survey study design was adopted to assess career preferences and related factors among nursing students in Macao.

Results: In total, 217 nursing students completed surveys. The most favorite career preferences among nursing students were community health nursing, paediatric nursing, medical surgical nursing, and obstetric & gynecological nursing; while the least career preferences among nursing students were oncology and hospice nursing, mental health nursing, and ER nursing. Factors were related to "gender", "education", and "nursing is my first study preference" among Macao nursing students for career preferences.

Conclusion: The senior nursing students prefer working in community health nursing and the junior and female nursing students prefer working in pediatric nursing and obstetric and gynecological nursing. The more understandings of nursing students' career preferences, the better nursing curriculum design and implication to promote nursing students' intention for working in the least career preferences work.

Keywords
nursing students, career preference, Macao

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Introduction

The World Health Organization (WHO) estimates that the world will need an additional 10.6 million nurses and midwives by the year 2030 (World Health Organization, 2020). Since the pandemic of Coronavirus disease 2019 (COVID-19) in January 2020, the nursing shortage issues have been magnified and exacerbated from physical and emotional stress, and moral distress (Turale et al., 2020). It is expected that more nurses are needed in the future (World Health Organization, 2020), thus nursing students' career preferences would be essential for providing direct nursing care in the future. Macao also faces the same situation for more nursing manpower by 2025 (Statistics and Census Service, 2020). Thus, nursing students' career choices are important for the future plan of health care in Macao.

Review of Literature

There have been problems in the shortage of nursing manpower (World Health Organization, 2020). Nursing students will play the important role to provide direct care in the future. Nursing students choosing nursing program as the major study may be linked to the future job security (Liaw et al., 2017), their future career choices will provide...
directions and knowledge to further contribute the manpower of healthcare.

Nursing students commonly have their ideas for future career from the beginning of nursing study (Hayes et al., 2006; Hunt et al., 2020; Wareing et al., 2017). Most nursing students chose pediatric nursing (Birks et al., 2010; Hunt et al., 2020; McCann et al., 2010; Stevens, 2011), obstetric and gynecological nursing (Birks et al., 2010), emergency nursing (Birks et al., 2010; Hunt et al., 2020) and medical and surgical nursing (Birks et al., 2010; Hovey et al., 2017; Stevens, 2011) as preferred future careers. Studies concluded that most nursing students chose to work in the hospital after graduation for the complex nursing knowledge and skills, especially for more attractive and challenging work in ‘medical-surgical nursing’ (Hsu & Ling, 2019; McCann et al., 2010). Nursing students also expressed the least preference working in mental health nursing at the hospital setting (van Iersel et al., 2016). Many nursing students reported that the higher preferences for working with children and stable patients, but they chose the least preference for working in aged care centers (Kloster et al., 2007). The gerontological nursing was rated the least preferred preference among nursing student (Hovey et al., 2017; Hunt et al., 2020; King et al., 2013; Kloster et al., 2007; McCann et al., 2010), as well as the mental health nursing also rated the least career choice after graduation (Alexander et al., 2020). On the other hand, ‘community health nursing’ was reported as “less popular” career among nursing students (Larsen et al., 2012; van Iersel et al., 2019) for the views as “not real nursing” (Norman, 2015; van Iersel et al., 2016). In addition, Jiang et al. (2019) concluded that few Chinese nursing students (19.8%) chose to work in ‘Oncology and Hospice Nursing’ after graduation as the end-of-life situation and death issues (Jiang et al., 2019).

Macao is a mainly Chinese society with the population ageing for the life expectancy in 84.1 years, it is estimated that more nurses will be needed by 2025 (Statistics and Census Service, 2020). Nursing students will be future nurses in Macao, their career choices will provide more in-depth understandings to contribute nursing education and manpower of healthcare in Macao. Thus, it is important to explore and understand nursing students’ career preferences and affecting factors for the preparation of nursing care in Macao.

Aim of the Study
As nursing students’ career preferences remain unknown in Macao, this study aimed to assess and explore the career preferences and examine the related factors among nursing students.

Methods
Design
This study adopted a descriptive, cross-sectional study design using the career preference questionnaire to investigate Macao nursing students’ career preferences and related factors.

Participants and Settings
All nursing students studying Bachelor Science in Nursing (BSN) programme at one Macao higher institute were invited during the academic year in 2019 to 2020. The inclusion criteria for nursing students were full-time study and willing to be included in the study, while the exclusion criteria were nursing students during the deferment and suspension of BSN study. The total number of nursing students in this study was two hundred and seventeen nursing students completed this survey questionnaire within three months.

Data Collection Tool
This instrument was a self-administered survey questionnaire including demographic characteristics and career preferences. The survey questionnaire was designed to explore nursing students’ career preferences and validated in the previous study (Hsu & Ling, 2019).

The demographic characteristics included age, gender, year of study, and the self-preference for nursing study. The career preferences by ranking questions consisted of ten items measuring from one (the most favorite career preference) to ten (the least career preference). The ten items career preferences included medical-surgical nursing, obstetrics and gynecology nursing, pediatric nursing, gerontological nursing (GN), mental health nursing, critical care nursing, emergency room (ER) nursing, community health nursing, operation room and anesthesia nursing, and hospice or oncology nursing. All questions in this survey followed a single-select, ordering preference format. Participants were guided to rank their career preferences from the first choice (the most favorite career preference) to the tenth choice (the least career preference).

Data Collection
After approval from the Institutional Review Board of the higher institute in Macao, this research was planned and conducted. Data were collected during September to November in 2020. All nursing students were invited and briefed the purpose of the study in class before joining and completion of this survey questionnaire. The researchers distributed questionnaires to participants in the classrooms and all participants signed consent forms and returned to research members. Participants took about 20–30 minutes to complete the survey questionnaire. Completed questionnaires were collected from participants without any personal identity instead of number codes. All completed survey questionnaires were checked and keyed into an electronic database by research members. The electronic database was stored at a secure space with password protection of computer.
**Ethical Consideration**

This study was supported and approved from the Ethical Review Board (Approval No. RP/ESCSD-03/2020/E001) at the higher institute where the study was conducted. The survey questionnaire included an information sheet at the first page for the purpose and procedure. Further, nursing students were briefed and emphasized that they have the right to withdraw from this study at any time without any consequence emerged afterwards. All participants signed and returned a written informed consent form. The confidentiality of participants was ensured and guaranteed, all identities have been replaced by codes and numbers in this research. The returned survey questionnaires were kept at the locked place for data security.

**Data Analysis**

The IBM SPSS Statistics 26 software (IBM, Armonk, NY, USA) was used to analyze the survey data. The descriptive statistical methods were used for analyses including frequency, percentage, mean, and standard deviation to describe the distribution of variables and the correct response rate of the questions. The statistics analysis on career preferences was conducted from the rank 1—the most favorite career preference to the 10—the least career preference. The frequency was used to calculate the category of the career preferences.

Each career preference ranked by participant was categorized into favorite-preference career (ranked by participant as the first to third career preferences), middle-preference career (ranked by participants as the fourth to seventh career preferences), and least-preference career (ranked by participants as the eighth to tenth career preferences). Chi-square was adopted to examine the differences and relationship between career preferences (the favorite, middle, and least-preference career) and categorical characteristics variables. The statistically significant was set a two-tailed at P-value <0.05.

**Results**

**Demographic Characteristics**

A total of 217 nursing students completed the survey questionnaire. Table 1 presented the demographic characteristics of the participants. Of these, the participants’ mean age was 21.4 years old (SD = 1.6) ranged from 18 to 26 years old. The majority were female (n = 160, 73.4%), of whom studying from year I to IV in BSN. Most participant answered “nursing as the first study preference (n = 185, 85.3) while 33.6% (n = 73) nursing students rated “working in GN after graduation”.

**Ranking of Career Preferences**

Table 2 presented the ranking of career preferences from 217 nursing students. The first (most favorite) career preference ranked by participants from community health nursing (n = 53, 24.4%), paediatric nursing (n = 52, 24%), medical-surgical nursing (n = 33, 15.2%), and obstetric & gynecological nursing (n = 33, 15.2%). The 10th (least preferred) career preference ranked by participants oncology and hospice nursing 18.9% (n = 41), mental health nursing 17.1% (n = 37), ER nursing 14.7% (n = 32).

**Variable and Career Preferences**

Table 3 showed the chi-square results related to the variables and career preferences (favorite-preference, middle-preference, and least-preference). Career preferences were categorized into the favorite-preference, middle-preference, and least-preference. Participants who ranked the 1st, 2nd and 3rd preferences career choice were categorized as the favorite-preference; ranked the 4th, 5th, 6th and 7th preferences were categorized as middle-preference; and ranked the 8th, 9th, and 10th preferences as least-preference.

**The Favorite-Preferences Career and Factors**

Macau nursing students’ favorite-preferences included pediatric nursing (n = 132), community health nursing (n = 114), obstetric & gynecological (Obs/Gyn) nursing (n = 104), medical-surgical nursing (n=98).

The factors related to pediatric nursing in the favorite-preference were “gender” and “year of education” with significant differences (p<0.05). Most female (n = 103), BSNI (66.7%), and BSNII (69.1%) nursing students ranked pediatric nursing as the favorite-preference career.

The factor related to community health nursing in the favorite-preference was “year of education” with significant differences (p<0.05). The most BSN III (75%) and BSN IV

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**Table 1. Demographic Characteristics of Nursing Students (n = 217).**

| Demographics                  | Frequency (%) |
|-------------------------------|---------------|
| **Mean age (SD)**            | 21.4 (1.6)    |
| **Age (years)**              |               |
| 18–20                         | 69 (31.7)     |
| 21–23                         | 128 (59)      |
| ≥24                           | 20 (9.2)      |
| **Gender**                   |               |
| Male                          | 57 (26.3)     |
| Female                        | 160 (73.7)    |
| **Year of study**            |               |
| Year I                        | 63 (28.9)     |
| Year II                       | 56 (25.7)     |
| Year III                      | 48 (22)       |
| Year IV                       | 51 (23.4)     |
| **Nursing as the first study choice** |           |
| No                            | 31 (14.3)     |
| Yes                           | 185 (85.3)    |
| Missing                       | 1 (0.1)       |
Table 2. Ranking of Career Preferences (n = 217).

| Item | Community Health Nursing (%) | Paediatric Nursing (%) | Medical Surgical Nursing (%) | Obstetric & Gynecological Nursing (%) | Emergency Room (ER) Nursing (%) | Mental Health Nursing (%) | Operation Room (OR) and Anesthesia Nursing (%) | Gerontological Nursing (%) | Critical Care Nursing (%) | Oncology and Hospice Nursing (%) |
|------|-------------------------------|------------------------|-------------------------------|--------------------------------------|---------------------------------|--------------------------|-----------------------------------------------|--------------------------|---------------------------|-------------------------------|
| 1<sup>st</sup> choice | 53 (24.4) | 52 (24) | 33 (15.2) | 33 (15.2) | 17 (7.8) | 11 (5.1) | 10 (4.6) | 5 (2.3) | 2 (0.9) | 1 (0.5) |
| 2<sup>nd</sup> choice | 30 (13.8) | 49 (22.6) | 24 (11.1) | 47 (21.7) | 13 (6) | 8 (3.7) | 13 (6) | 20 (9.2) | 9 (4.1) | 4 (1.8) |
| 3<sup>rd</sup> choice | 31 (14.3) | 30 (13.8) | 36 (16.6) | 25 (11.5) | 17 (7.8) | 12 (5.5) | 18 (8.3) | 21 (9.7) | 11 (5.1) | 16 (7.4) |
| 4<sup>th</sup> choice | 22 (10.1) | 17 (7.8) | 23 (10.6) | 31 (14.3) | 22 (10.1) | 16 (7.4) | 20 (9.2) | 30 (13.8) | 16 (7.4) | 20 (9.2) |
| 5<sup>th</sup> choice | 20 (9.2) | 14 (6.5) | 34 (15.7) | 25 (11.5) | 21 (9.7) | 25 (11.5) | 27 (12.4) | 20 (9.2) | 13 (6) | 18 (8.3) |
| 6<sup>th</sup> choice | 8 (3.7) | 10 (4.6) | 20 (9.2) | 14 (6.5) | 19 (8.8) | 26 (12) | 26 (12) | 31 (14.3) | 35 (16.1) | 28 (12.9) |
| 7<sup>th</sup> choice | 10 (4.6) | 17 (7.8) | 21 (9.7) | 9 (4.1) | 29 (13.4) | 33 (15.2) | 32 (14.7) | 15 (6.9) | 25 (11.5) | 26 (12) |
| 8<sup>th</sup> choice | 15 (6.9) | 12 (5.5) | 11 (5.1) | 12 (5.5) | 21 (9.7) | 24 (11.1) | 28 (12.9) | 24 (11.1) | 31 (14.3) | 39 (18) |
| 9<sup>th</sup> choice | 15 (6.9) | 7 (3.2) | 5 (2.3) | 13 (6) | 27 (12.4) | 29 (13.4) | 28 (12.9) | 23 (10.6) | 46 (21.2) | 24 (11.1) |
| 10<sup>th</sup> choice | 11 (5.1) | 8 (3.7) | 11 (5.1) | 9 (4.1) | 32 (14.7) | 37 (17.1) | 13 (6) | 28 (12.9) | 27 (12.4) | 41 (18.9) |

Note: The first choice means the most favorite career preference; the tenth choice means the least career preference.
### Table 3. Variables and Career Preferences.

| Items                                      | Favorite (%) | Middle (%) | Least (%) | Total (%) | df | p     |
|-------------------------------------------|--------------|------------|-----------|-----------|----|-------|
| **Pediatric Nursing**                     |              |            |           |           |    |       |
| Age (years)                               |              |            |           |           |    |       |
| 18–20                                     | 44(63.8)     | 17(24.6)   | 8(11.6)   | 69(100)   | 4  | 0.034*|
| 21–23                                     | 82(64.1)     | 33(25.8)   | 13(10.2)  | 128(100)  |    |       |
| ≥24                                       | 6(30)        | 8(40)      | 6(30)     | 20(100)   |    |       |
| Total                                     | 132(60.8)    | 58(26.7)   | 27(12.4)  | 217(100)  |    |       |
| Gender                                    |              |            |           |           |    |       |
| Male                                      | 29(50.9)     | 15(26.3)   | 13(22.8)  | 57(100)   | 2  | 0.019**|
| Female                                    | 103(64.4)    | 43(26.9)   | 14(8.8)   | 160(100)  |    |       |
| Total                                     | 132(60.8)    | 58(26.7)   | 27(12.4)  | 217(100)  |    |       |
| Education                                 |              |            |           |           |    |       |
| BSN I                                     | 42(66.7)     | 14(22.2)   | 7(11.1)   | 63(100)   | 6  | 0.003**|
| BSN II                                    | 38(69.1)     | 12(21.8)   | 5(9.1)    | 55(100)   |    |       |
| BSN III                                   | 34(70.8)     | 11(22.9)   | 3(6.3)    | 48(100)   |    |       |
| BSN IV                                    | 18(35.3)     | 21(41.2)   | 12(23.5)  | 51(100)   |    |       |
| Total                                     | 132(60.8)    | 58(26.7)   | 27(12.4)  | 217(100)  |    |       |
| Nursing is my first study choice          |              |            |           |           |    |       |
| No                                        | 22(71)       | 7(22.6)    | 2(6.5)    | 31        | 2  | 0.379 |
| Yes                                       | 109(58.9)    | 51(27.6)   | 25(13.5)  | 185       |    |       |
| Total                                     | 131(60.6)    | 58(26.9)   | 27(12.5)  | 216       |    |       |
| **Community Health Nursing**              |              |            |           |           |    |       |
| Age (years)                               |              |            |           |           |    |       |
| 18–20                                     | 28(40.6)     | 22(31.9)   | 19(27.5)  | 69(100)   | 4  | 0.123 |
| 21–23                                     | 74(57.8)     | 33(25.8)   | 21(16.4)  | 128(100)  |    |       |
| ≥24                                       | 12(60)       | 6(30)      | 2(10)     | 20(100)   |    |       |
| Total                                     | 114(52.5)    | 61(28.1)   | 42(19.4)  | 217(100)  |    |       |
| Gender                                    |              |            |           |           |    |       |
| Male                                      | 30(52.6)     | 11(19.3)   | 16(28.1)  | 57(100)   | 2  | 0.075 |
| Female                                    | 84(52.5)     | 50(31.3)   | 26(16.3)  | 160(100)  |    |       |
| Total                                     | 114(52.5)    | 61(28.1)   | 42(19.4)  | 217(100)  |    |       |
| Education                                 |              |            |           |           |    |       |
| BSN I                                     | 26(41.3)     | 21(33.3)   | 16(25.4)  | 63(100)   | 6  | 0.000***|
| BSN II                                    | 23(41.8)     | 14(25.5)   | 18(32.7)  | 55(100)   |    |       |
| BSN III                                   | 36(75)       | 7(14.6)    | 5(10.4)   | 48(100)   |    |       |
| BSN IV                                    | 29(56.9)     | 19(37.3)   | 3(6.8)    | 51(100)   |    |       |
| Total                                     | 114(52.5)    | 61(28.1)   | 42(19.4)  | 217(100)  |    |       |
| Nursing is my first study choice          |              |            |           |           |    |       |
| No                                        | 14(45.2)     | 12(38.7)   | 5(16.1)   | 31(100)   | 2  | 0.375 |
| Yes                                       | 99(53.5)     | 49(26.5)   | 37(20)    | 185(100)  |    |       |
| Total                                     | 113(52.)     | 61(28.2)   | 42(19.4)  | 216(100)  |    |       |
| **Ob/Gyn Nursing**                        |              |            |           |           |    |       |
| Age (years)                               |              |            |           |           |    |       |
| 18–20                                     | 38(55.1)     | 22(31.9)   | 9(13)     | 69(100)   | 4  | 0.008**|
| 21–23                                     | 63(49.2)     | 47(36.7)   | 18(14.1)  | 128(100)  |    |       |
| ≥24                                       | 3(15)        | 9(45)      | 8(40)     | 20(100)   |    |       |
| Total                                     | 104(47.9)    | 78(35.9)   | 35(16.1)  | 217(100)  |    |       |
| Gender                                    |              |            |           |           |    |       |
| Male                                      | 17(29.8)     | 20(35.1)   | 20(35.1)  | 57(100)   | 2  | 0.000***|
| Female                                    | 87(54.4)     | 58(36.3)   | 15(9.4)   | 160(100)  |    |       |
| Total                                     | 104(47.9)    | 78(35.9)   | 35(16.1)  | 217(100)  |    |       |
| Education                                 |              |            |           |           |    |       |
| BSN I                                     | 28(44.4)     | 26(41.3)   | 9(14.3)   | 63(100)   | 6  | 0.001***|
| BSN II                                    | 39(70.9)     | 11(20)     | 5(9.1)    | 55(100)   |    |       |
| BSN III                                   | 19(39.6)     | 23(47.9)   | 6(12.5)   | 48(100)   |    |       |
| BSN IV                                    | 18(35.3)     | 18(38.3)   | 15(29.4)  | 51(100)   |    |       |
| Total                                     | 104(47.9)    | 78(35.9)   | 35(16.1)  | 217(100)  |    |       |

(continued)
Table 3. Continued.

| Items                              | Favorite (%) | Middle (%) | Least (%) | Total (%) | df | p   |
|------------------------------------|--------------|------------|-----------|-----------|----|-----|
| **Nursing is my first study choice** |              |            |           |           |    |     |
| No                                 | 12(38.7)     | 9(29)      | 10(32.3)  | 31(100)   | 2  | 0.032* |
| Yes                                | 91(49.2)     | 69(37.3)   | 25(13.5)  | 185(100)  |    |     |
| Total                              | 103(47.7)    | 78(36.1)   | 35(16.2)  | 216(100)  |    |     |
| **Medical-Surgical Nursing**       |              |            |           |           |    |     |
| Age (years)                        |              |            |           |           | 4  | 0.455 |
| 18–20                              | 31(44.9)     | 30(43.5)   | 8(11.6)   | 69(100)   |    |     |
| 21–23                              | 49(38.3)     | 62(48.4)   | 17(13.3)  | 128(100)  |    |     |
| ≥24                                | 12(60)       | 6(30)      | 2(10)     | 20(100)   |    |     |
| Total                              | 92(42.4)     | 98(45.2)   | 27(12.4)  | 217(100)  |    |     |
| Gender                             |              |            |           |           | 2  | 0.103 |
| Male                               | 29(50.9)     | 25(43.9)   | 3(5.3)    | 57(100)   |    |     |
| Female                             | 63(39.4)     | 73(46.1)   | 24(15)    | 160(100)  |    |     |
| Total                              | 92(42.4)     | 98(45.2)   | 27(12.4)  | 217(100)  |    |     |
| Education                          |              |            |           |           | 6  | 0.242 |
| BSN I                              | 27(42.9)     | 28(44.4)   | 8(12.7)   | 63(100)   |    |     |
| BSN II                             | 22(40)       | 29(52.7)   | 4(7.3)    | 55(100)   |    |     |
| BSN III                            | 16(33.6)     | 22(45.8)   | 10(20.8)  | 48(100)   |    |     |
| BSN IV                             | 27(52.9)     | 19(37.3)   | 5(9.8)    | 51(100)   |    |     |
| Total                              | 92(42.4)     | 98(45.2)   | 27(12.4)  | 217(100)  |    |     |
| **Nursing is my first study choice** |              |            |           |           | 2  | 0.936 |
| No                                 | 14(45.2)     | 13(41.9)   | 4(12.9)   | 31(100)   |    |     |
| Yes                                | 78(42.2)     | 84(45.4)   | 23(12.4)  | 185(100)  |    |     |
| Total                              | 92(42.6)     | 97(45.4)   | 27(12.5)  | 216(100)  |    |     |
| **ER Nursing**                     |              |            |           |           |    |     |
| Age (years)                        |              |            |           |           | 4  | 0.033* |
| 18–20                              | 17(24.6)     | 37(53.6)   | 15(21.7)  | 69(100)   |    |     |
| 21–23                              | 25(19.5)     | 50(39.1)   | 53(41.4)  | 128(100)  |    |     |
| ≥24                                | 5(25)        | 5(25)      | 10(50)    | 20(100)   |    |     |
| Total                              | 47(21.7)     | 92(42.4)   | 78(35.9)  | 217(100)  |    |     |
| Gender                             |              |            |           |           | 2  | 0.111 |
| Male                               | 14(24.6)     | 29(50.9)   | 14(24.6)  | 57(100)   |    |     |
| Female                             | 33(20.6)     | 63(39.4)   | 64(40)    | 160(100)  |    |     |
| Total                              | 47(21.7)     | 92(42.4)   | 78(35.9)  | 217(100)  |    |     |
| Education                          |              |            |           |           | 6  | 0.036* |
| BSN I                              | 17(27)       | 32(50.8)   | 14(22.2)  | 63(100)   |    |     |
| BSN II                             | 12(21.8)     | 27(49.1)   | 16(29.1)  | 55(100)   |    |     |
| BSN III                            | 8(16.7)      | 17(35.4)   | 23(47.9)  | 48(100)   |    |     |
| BSN IV                             | 10(19.6)     | 16(31.4)   | 25(49)    | 51(100)   |    |     |
| Total                              | 47(21.7)     | 92(42.4)   | 78(35.9)  | 217(100)  |    |     |
| **Nursing is my first study choice** |              |            |           |           | 2  | 0.182 |
| No                                 | 3(9.7)       | 14(45.2)   | 14(45.2)  | 31(100)   |    |     |
| Yes                                | 44(23.8)     | 78(42.2)   | 63(34.1)  | 185(100)  |    |     |
| Total                              | 47(21.8)     | 92(42.6)   | 77(35.6)  | 216(100)  |    |     |
| **Gerontological Nursing**         |              |            |           |           |    |     |
| Age (years)                        |              |            |           |           | 4  | 0.009*** |
| 18–20                              | 9(13)        | 31(44.9)   | 29(42)    | 69(100)   |    |     |
| 21–23                              | 27(21.1)     | 59(46.1)   | 42(32.8)  | 128(100)  |    |     |
| ≥24                                | 10(50)       | 6(30)      | 4(20)     | 20(100)   |    |     |
| Total                              | 46(21.2)     | 96(44.2)   | 75(34.6)  | 217(100)  |    |     |
| Gender                             |              |            |           |           | 2  | 0.914 |
| Male                               | 13(22.8)     | 24(42.1)   | 20(35.1)  | 57(100)   |    |     |
| Female                             | 33(20.6)     | 72(45)     | 55(34.4)  | 160(100)  |    |     |
| Total                              | 46(21.2)     | 96(44.2)   | 76(34.6)  | 217(100)  |    |     |

(continued)
Table 3. Continued.

| Items                         | Favorite (%) | Middle (%) | Least (%) | Total (%) | df | p  |
|-------------------------------|--------------|------------|-----------|-----------|----|----|
| **Education**                 |              |            |           |           |    |    |
| BSN I                         | 6(15.9)      | 25(39.7)   | 28(44.4)  | 63(100)   | 6  | 0.016* |
| BSN II                        | 6(10.9)      | 28(50.9)   | 21(38.2)  | 55(100)   |    |    |
| BSN III                       | 11(22.9)     | 24(50)     | 13(27.1)  | 48(100)   |    |    |
| BSN IV                        | 19(37.3)     | 19(37.3)   | 13(25.5)  | 51(100)   |    |    |
| Total                         | 46(21.2)     | 96(44.2)   | 75(34.6)  | 217(100)  |    |    |
| **Nursing is my first study choice** |    |            |           |           |    |    |
| No                            | 5(16.1)      | 17(54.8)   | 9(29)     | 31(100)   | 2  | 0.414 |
| Yes                           | 41(22.2)     | 78(42.2)   | 66(35.7)  | 185(100)  |    |    |
| Total                         | 46(21.3)     | 95(44)     | 75(34.7)  | 216(100)  |    |    |
| **OR Nursing**                |              |            |           |           |    |    |
| Age (years)                   |              |            |           |           | 4  | 0.187 |
| 18–20                         | 12(17.4)     | 39(56.5)   | 18(26.1)  | 69(100)   |    |    |
| 21–23                         | 28(21.9)     | 55(43)     | 45(35.2)  | 128(100)  |    |    |
| ≥24                           | 5(5)         | 12(60)     | 7(35)     | 20(100)   |    |    |
| Total                         | 41(18.9)     | 106(48.8)  | 70(32.3)  | 217(100)  |    |    |
| **Gender**                    |              |            |           |           | 2  | 0.825 |
| Male                          | 12(21.1)     | 26(45.6)   | 19(33.3)  | 57(100)   |    |    |
| Female                        | 29(18.1)     | 80(50)     | 51(31.9)  | 160(100)  |    |    |
| Total                         | 41(18.9)     | 106(48.8)  | 70(32.3)  | 217(100)  |    |    |
| **Education**                 |              |            |           |           | 6  | 0.67  |
| BSN I                         | 14(22.2)     | 33(52.4)   | 16(25.4)  | 63(100)   |    |    |
| BSN II                        | 10(18.2)     | 28(50.9)   | 17(30.9)  | 55(100)   |    |    |
| BSN III                       | 9(18.8)      | 19(39.6)   | 20(41.7)  | 48(100)   |    |    |
| BSN IV                        | 8(15.7)      | 26(51)     | 17(33.3)  | 51(100)   |    |    |
| Total                         | 41(18.9)     | 106(48.8)  | 70(32.3)  | 217(100)  |    |    |
| **Nursing is my first study choice** |    |            |           |           | 2  | 0.996 |
| No                            | 6(19.4)      | 15(48.4)   | 10(32.3)  | 31(100)   |    |    |
| Yes                           | 35(18.9)     | 91(49.2)   | 59(31.9)  | 185(100)  |    |    |
| Total                         | 41(19)       | 106(49.1)  | 69(31.9)  | 216(100)  |    |    |
| **Mental Health Nursing**     |              |            |           |           | 4  | 0.035* |
| Age (years)                   |              |            |           |           |    |    |
| 18–20                         | 10(14.5)     | 26(37.7)   | 33(47.8)  | 69(100)   |    |    |
| 21–23                         | 15(11.7)     | 58(45.3)   | 55(43)    | 128(100)  |    |    |
| ≥24                           | 5(25)        | 13(65)     | 2(10)     | 20(100)   |    |    |
| Total                         | 30(13.8)     | 97(44.7)   | 90(41.5)  | 217(100)  |    |    |
| **Gender**                    |              |            |           |           | 2  | 0.309 |
| Male                          | 10(17.5)     | 28(49.1)   | 19(33.3)  | 57(100)   |    |    |
| Female                        | 20(12.5)     | 69(43.1)   | 71(44.4)  | 160(100)  |    |    |
| Total                         | 30(13.8)     | 97(44.7)   | 90(41.5)  | 217(100)  |    |    |
| **Education**                 |              |            |           |           | 6  | 0.048* |
| BSN I                         | 7(11.1)      | 23(36.5)   | 33(52.4)  | 63(100)   |    |    |
| BSN II                        | 7(12.7)      | 27(49.1)   | 21(38.2)  | 55(100)   |    |    |
| BSN III                       | 3(6.3)       | 24(50)     | 21(43.8)  | 48(100)   |    |    |
| BSN IV                        | 13(25.5)     | 23(45.1)   | 15(29.4)  | 51(100)   |    |    |
| Total                         | 30(13.8)     | 97(44.7)   | 90(41.5)  | 217(100)  |    |    |
| **Nursing is my first study choice** |    |            |           |           | 2  | 0.315 |
| No                            | 7(22.6)      | 12(38.7)   | 12(38.7)  | 31(100)   |    |    |
| Yes                           | 23(12.4)     | 84(45.4)   | 78(42.2)  | 185(100)  |    |    |
| Total                         | 30(13.9)     | 96(44.4)   | 90(41.7)  | 216(100)  |    |    |
| **Critical Care Nursing**     |              |            |           |           | 4  | 0.703 |
| Age (years)                   |              |            |           |           |    |    |
| 18–20                         | 10(14.5)     | 27(39.1)   | 32(46.4)  | 69(100)   |    |    |
| 21–23                         | 11(8.6)      | 56(43.8)   | 61(47.7)  | 128(100)  |    |    |
| ≥24                           | 2(10)        | 7(35)      | 11(55)    | 20(100)   |    |    |
| Total                         | 23(10.6)     | 90(41.5)   | 104(47.9) | 217(100)  |    |    |
(56.9%) nursing students preferred working in community health nursing as the favorite-preference career.

The factors related to obstetric & gynecological (Obs/Gyn) nursing in the favorite-preference were “gender”, “year of education”, and “nursing is my first study preference” with significant differences (p < 0.05). It was observed that most BSNI (44.4%), BSNII (70.9%) and female (54.4%) nursing students preferred working in obstetric & gynecological nursing. In addition, students who selected nursing as their first study preference (49.2%) also preferred working in obstetric & gynecological nursing in the future.

**The Least-Preferences Career and Factors**

The least-preference career of Macau nursing students included oncology and hospice nursing (n = 104), critical care nursing (n = 104), mental health nursing (n = 103), ER Nursing (n = 78), and gerontological nursing (n = 75).

There was no significant factor of oncology and hospice nursing, while 52.5% female nursing students ranked critical care nursing as the least-preference career with significant differences (p < 0.05). The factor related to mental health nursing in the least-preference career was “year of education” with significant differences (p < 0.05). The most BSNI (52.4%) and BSNII (38.2%) nursing students ranked mental health nursing as the least-preference career.

The factor related to ER nursing in the least-preference career was “year of education” with significant differences (p < 0.05). The most BSN III (47.9%) and BSN IV (49%) nursing students ranked ER nursing as the least-preference career.

**Table 3. Continued.**

| Items                               | Favorite (%) | Middle (%) | Least (%) | Total (%) | df | p   |
|-------------------------------------|--------------|------------|-----------|-----------|----|-----|
| Gender                              |              |            |           |           | 2  | 0.033*   |
| Male                                | 10(17.5)     | 27(47.4)   | 20(35.1)  | 57(100)   |    |     |
| Female                              | 13(8.1)      | 63(39.4)   | 84(52.5)  | 160(100)  |    |     |
| Total                               | 23(10.6)     | 90(41.5)   | 104(47.9) | 217(100)  |    |     |
| Education                           |              |            |           |           | 6  | 0.385    |
| BSN I                               | 10(15.9)     | 27(42.9)   | 26(41.3)  | 63(100)   |    |     |
| BSN II                              | 5(9.1)       | 21(38.2)   | 29(52.7)  | 55(100)   |    |     |
| BSN III                             | 2(4.2)       | 24(50)     | 22(45.8)  | 48(100)   |    |     |
| BSN IV                              | 6(11.8)      | 18(35.3)   | 27(52.9)  | 51(100)   |    |     |
| Total                               | 23(10.6)     | 90(41.5)   | 104(47.9) | 217(100)  |    |     |
| Nursing is my first study choice    |              |            |           |           | 2  | 0.767    |
| No                                  | 4(12.9)      | 14(45.2)   | 13(41.9)  | 31(100)   |    |     |
| Yes                                 | 19(10.3)     | 76(41.1)   | 90(48.6)  | 185(100)  |    |     |
| Total                               | 23(10.6)     | 90(41.7)   | 103(47.7) | 216(100)  |    |     |

**Oncology and Hospice Nursing**

**Age (years)**

| Age (years) | Favorite (%) | Middle (%) | Least (%) | Total (%) | df | p   |
|-------------|--------------|------------|-----------|-----------|----|-----|
| 18–20       | 7(10.1)      | 25(36.2)   | 37(53.6)  | 69(100)   |    | 0.336 |
| 21–23       | 10(7.8)      | 59(46.1)   | 59(46.1)  | 128(100)  |    |     |
| ≥24         | 3(20)        | 8(40)      | 8(40)     | 20(100)   |    |     |
| Total       | 21(9.7)      | 92(42.4)   | 104(47.9) | 217(100)  |    |     |

**Gender**

| Gender | Favorite (%) | Middle (%) | Least (%) | Total (%) | df | p   |
|--------|--------------|------------|-----------|-----------|----|-----|
| Male   | 7(12.3)      | 23(40.4)   | 27(47.4)  | 57(100)   |    | 0.732 |
| Female | 14(8.8)      | 69(43.1)   | 77(48.1)  | 160(100)  |    |     |
| Total  | 21(9.7)      | 92(42.4)   | 104(47.9) | 217(100)  |    |     |

**Education**

| Education | Favorite (%) | Middle (%) | Least (%) | Total (%) | df | p   |
|-----------|--------------|------------|-----------|-----------|----|-----|
| BSN I     | 7(11.1)      | 23(36.5)   | 33(52.4)  | 63(100)   |    | 0.704 |
| BSN II    | 3(5.5)       | 23(41.8)   | 29(52.7)  | 55(100)   |    |     |
| BSN III   | 6(12.5)      | 21(43.8)   | 21(43.8)  | 48(100)   |    |     |
| BSN IV    | 5(9.8)       | 25(49)     | 21(41.2)  | 51(100)   |    |     |
| Total     | 21(9.7)      | 92(42.4)   | 104(47.9) | 217(100)  |    |     |

**Nursing is my first study choice**

| Nursing is my first study choice | Favorite (%) | Middle (%) | Least (%) | Total (%) | df | p   |
|----------------------------------|--------------|------------|-----------|-----------|----|-----|
| No                               | 6(19.4)      | 11(35.5)   | 14(45.2)  | 31(100)   |    | 0.142 |
| Yes                              | 15(8.1)      | 80(43.2)   | 90(48.6)  | 185(100)  |    |     |
| Total                            | 21(9.7)      | 91(42.1)   | 104(48.1) | 216(100)  |    |     |

Note: *p < .05; **p < .00.
The factor related to gerontological nursing (GN) in the least-preference career was “year of education” with significant differences (p < 0.05). It was observed that most BSNI (44.4%) and BSNII (38.2%) nursing students ranked GN as the least-preference career.

Discussion

This purpose of this study was to provide the descriptive and in-depth knowledge into Macao nursing students’ career preferences with comparing the existing literature. Pediatric nursing, community health nursing, obstetric & gynecological (Obs/Gyn) nursing, and medical-surgical nursing were the favorite-preferences career among Macau nursing students. On the other hand, the least-preference career among Macau nursing students included oncology and hospice nursing, critical care nursing, mental health nursing, ER Nursing, and gerontological nursing. Age, gender, and year of study were factors related to nursing students’ future preference choices in Macao. The findings were compared with several nursing studies on nursing students’ career preferences and the higher rates in working in the nursing care settings.

The Favorite Career Preferences and Factors

The findings of this study are consistent with several studies that most nursing students chose pediatric nursing” (Birks et al., 2010; Hunt et al., 2020; McCann et al., 2010; Stevens, 2011), “medical and surgical nursing” (Birks et al., 2010; Hovey et al., 2017; Hsu & Ling, 2019; McCann et al., 2010; Stevens, 2011) and obstetric and gynecological nursing (Birks et al., 2010) as the favorite career preferences.

This study revealed that younger age, female, nursing as the first study preference were the factors for the favorite preference in obstetric and gynecological nursing and pediatric nursing as the favorite career preferences. The findings may be related to gender difference (Wei et al., 2021) and nursing students’ previous experiences (Hunt et al., 2020) with normal and healthy cases in children and women care, as well as the society influences for the social prestige in child and women health.

Nursing students chose “medical and surgical nursing” as the favorite career preference was consistent with the previous study (Hsu & Ling, 2019; Kloster et al., 2007; McCann et al., 2010; van Iersel et al., 2016) and the reason may be due to not losing skill and more value with high-tech settings (Alexander et al., 2020; Hsu & Ling, 2019) in clinical setting.

“Community health nursing” was also ranked as the most favorite career among Macao nursing students. This finding has the same result with previous pilot study in Macao (Hsu & Ling, 2019), but it’s not consistent with the results of other studies as “less popular” career and “not real nursing” for “community health nursing” reported by nursing students (Larsen et al., 2012; van Iersel et al., 2019; van Iersel et al., 2016). “Community health nursing” was ranked as one of the favorite preferences among Macao nursing students that can be related to the structure of Macao healthcare system for the following reasons. First, Macao has stable community health care system for over 140 years including eight community health care centers and three community health care stations which provide the primary health care service to residents in communities (Health Bureau of Macao, 2021). The eight community health care centers and three community health care stations are under Macao Health Bureau that provide high salary and benefits to nursing staffs as civil servants in Macao. Second, there are many associations to provide primary health care in Macao such as Worker’s Medical Clinic that also have stable salary schemes and benefits to nursing staffs. Moreover, senior Macao nursing students chose community health nursing as the favorite career preference. This reason may be related to the seniors nursing students have the understandings of the needs for nursing manpower in community health nursing and the current situations of Macao that newly Macao nursing graduates commonly working in the community settings and aged care centers such as Worker’s Medical Clinic and nursing home (Hsu & Ling, 2019; Hsu et al., 2019).

The Least Career Preference and Factors

Over 50% Macao nursing students have ranked oncology and hospice nursing (18.9%), mental health nursing (17.1%), and ER nursing (14.7%) as the least favorite career preferences. Macao nursing students have almost the same preferences for ranking mental health nursing as the least (tenth) career preference (Alexander et al., 2020; Delaney et al., 2019; Flaskerud, 2018; Rice et al., 2019). The mental health nursing might be considered less value than other nursing specialties and related to stigma for the mental illness in the society (Flaskerud, 2018) especially among nursing students. Studies suggested nursing students have more experiences to contact with mentally illness persons (Alexander et al., 2020; Hunt et al., 2020) to decrease the stigma of mental illness, that may improve their preferences for working in the mental health nursing after graduation. The clinical practice of mental health nursing is applied at the third year of BSN study in Macao, it might be considered adding more time in getting along with mental illness persons to promote nursing students’ better experiences in mental health nursing.

Macao nursing students also ranked oncology and hospice nursing is the least career preference. This is an urgent issue as neoplasm is the main cause of deaths in Macao (Statistics and Census Service, 2020). The support to oncology and hospice nursing would be needed in order to provide quality of nursing care for oncology patients in Macao.
Surprisingly, ER nursing was ranked as the least career preferences among Macao nursing students which was consistent with one recent study (Hunt et al., 2020) but different with previous study (Ganz & Kahana, 2006). This finding also raised the issue in the preparedness for working at ER nursing, especially under the pandemic threat of COVID-19 that may affect nursing students career preferences.

Moreover, only five nursing students (2.3%) chose gerontological nursing (GN) as the first favorite preference though it is consistent with existing studies (Hsu & Ling, 2019; King et al., 2013; McCann et al., 2010; Stevens, 2011). This finding provided the immediate concern as Macao is under the situation for over 10% ageing population in the society (Statistics and Census Service, 2020). As population ageing, healthcare personnel especially in nursing manpower for gerontological nursing would be urgently considered and needed from now to the future. Therefore, strategies for promoting nursing students’ intention for working to GN should be considered during the BSN study such as the positive understanding of ageing (Hunt et al., 2020) and the good GN clinical placement experience (King et al., 2013) which also increase nursing students’ attitudes towards older people for their work preference in the future.

Limitations

There were some limitations in this study. First, the survey size did not include all nursing students in Macao. Though this school captured about 50% of the nursing students enrolled at the BSN programme in Macao. Second, the cross-sectional study, career preferences among nursing students could be change according to the semester, clinical practice, and year of study in which nursing students were surveyed. Third, this study used self-reported survey and it is possible that nursing students who already discussed with others as this topic was related to their career choices. Moreover, this study did not explore nursing students’ perceptions and views for their future plans.

Implications and Suggestions for Practice

The findings provide the knowledge and evidence to nursing education in curriculum design and modification. The more understandings of nursing students’ career preferences, the better nursing curriculum design and implication to promote nursing students’ intention for working into the least career preference work. Nursing educators may adopt appropriate strategies to promote nursing students positive learning experiences into oncology and hospice nursing, mental health nursing, ER nursing, and GN. However, there may be challenges regarding to the promotion of the least career preferences among nursing students. Future research might be focused on the intervention strategies in nursing students.

Furthermore, the future research can study the curriculum, clinical practice experiences, and nursing students’ interests for the specific future career. As nursing educators have the role to support nursing students’ knowledge and learning needs before any preferences and decision. In addition, future research may be designed to explore the perceptions and feeling among nursing students in choosing future careers.

Conclusions

This study concluded that community health nursing, pediatric nursing, medical-surgical nursing and obstetric & gynecological nursing were the most favorite career preferences among Macao nursing students. On the other hand, the least career preference among Macao nursing students were oncology and hospice nursing, mental health nursing, and ER nursing. Macao senior nursing students tended to choose community health nursing as the first career preference, while junior and female nursing students chose pediatric nursing and obstetric & gynecological nursing as the first career preference. Furthermore, the perception and feeling of nursing students for career preferences should be considered and studied to contribute nursing care in Macao.

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Study design and preparation: MHKH, QHY.
Data collection: QHY, MHKH.
Data analysis and interpretation: MHKH, MHL.
Draft of manuscript: MHKH, MHL.
Critical review and revision: MHKH, MHL.

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ORCID iD

Mei Hua Kerry Hsu https://orcid.org/0000-0003-3420-3140

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