

Patients' preferences for nutrition care from health professionals in public primary care setting: A cross-sectional study in Singapore

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Dear Editor,

The Burden of Disease in Singapore 1990–2017 report by the Ministry of Health, Singapore and Institute for Health Metrics and Evaluation highlighted that the largest contributors to Singapore's disease burden were non-communicable diseases (e.g. chronic diseases such as hypertension, diabetes mellitus and hyperlipidaemia), which comprised 80.3% of the total burden in 2017. Of these, the largest burdens were from cardiovascular diseases, making up 14.2% of total disability-adjusted life years (DALYs).¹

The Global Burden of Diseases, Injuries, and Risk Factors Study 2019 reported 8% to less than 10% of DALYs in Singapore are attributable to dietary risks,² which meant that the burden caused by metabolic diseases could potentially be reduced by early intervention of modifiable risk factors, such as diet and nutrition. Nutrition care, which is the provision of nutrition-related advice and counselling by a health-care professional (HCP), to improve the nutrition behaviour of patients,³ can be provided by different HCPs, such as doctors, dietitians and nurses. An Australian qualitative study found that primary care physicians were preferred by patients to be the providers of nutrition care as they were considered to provide personalised and professional nutrition care.³

To our knowledge, no studies have explored preferences and their associated factors as well as perceptions towards nutrition care among patients with chronic conditions in Asia. This is a knowledge gap that our study sought to address.

We conducted a facility-based cross-sectional survey of patients aged 21 years and above with at least 1 chronic condition (diabetes mellitus, hypertension, hyperlipidaemia) in a polyclinic situated in the northern part of Singapore from 22 July 2023 to 8 May 2024. Ethics approval was obtained from the National Healthcare Group Domain Specific Review Board (DSRB Reference: 2022/00855).

As there is no existing relevant validated questionnaire suited to answer our research question, the study team designed a self-administered research

questionnaire with 22 questions in English by adapting 3 overseas qualitative studies^{3,4,5} to the Singapore context (Supplementary materials, Appendix S1).

Patients were recruited via convenience sampling and invited to complete this questionnaire. They were approached by trained study team members who were care coordinators with a nursing background and managed the care of patients with chronic conditions. Informed consent was obtained from patients by study team members.

We approached 482 eligible patients and 14 declined to participate; 468 patients were recruited and 30 with incomplete data were removed via case-wise omission, yielding 438 patients with complete responses with approximately 4.5% margin of error. A summary of the sociodemographic data of the patients is presented in Supplementary Table S1.

We developed two binary logistic regression models to examine the patients' preferred source of nutrition care between doctors and dietitians, and their reasons for their preference. The first model examined the patients' preference for doctors, and the model examined their preference for dietitians; both models controlled for age and sociodemographic factors, using R studio version 2023.09.1+494 (RStudio Corporation, Massachusetts, US) running R-Base (4.2.2). Presence of multicollinearity was tested by examining the variance inflation factor (VIF) of each predictor variable. All predictor variables showed a VIF of less than 5, indicating low concern of multicollinearity.

In the two binary logistic regression models, the dependent variables were the patients' preference for doctors or dietitians as their source of nutrition care; the independent variables were the patients' age, sex, ethnicity, types of chronic conditions, education level and household income, with odds ratio (OR) and 95% confidence interval (CI) for each variable. *P* values <0.05 were considered statistically significant.

Among the 438 patients included in the study, the majority were Chinese (248/438, 56.6%) and the

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most common chronic disease was hyperlipidaemia (311/438, 71.0%), similar to findings from the Singapore National Health Survey 2022.⁶ The majority of patients indicated doctors as their preferred provider of nutritional care (198/438, 45.2%), followed by dietitians (161/438, 36.8%) and nurses (79/438, 18.0%). For those who chose doctors, the top reasons were reliability (141/198, 71.2%), comfort (114/198, 57.6%) and convenience (99/198, 50.0%). These findings are similar to the findings of the Australian study by Ball et al. 2014.³

From our survey, a vast majority of patients 77.6% (340/438) had received nutritional care from an HCP previously, with 47.6% (162/340) from doctors, 25.9% (88/340) from nurses and 26.5% (90/340) from dietitians.

A summary of the factors influencing the patients' preferences as well as their perceptions towards the nutritional care provided by the HCPs is presented in Supplementary Fig. S1. Across the 3 HCPs, a significantly lower percentage of patients who received nutritional care from doctors felt that doctors had spent sufficient time with them (137/162, 84.6%), compared with those who received nutritional care from nurses (83/88, 94.3%) and dietitians (85/90, 94.4%). Also, a significantly lower percentage of patients who received nutritional care from doctors (111/162, 68.5%) felt that the recommendations given were easy to follow compared with those who received nutritional care from nurses (75/88, 85.2%) and dietitians (67/90, 74.4%).

A vast majority of patients felt that nutritional care was useful (385/438, 87.9%), important (383/438, 87.4%) and accessible (354/438, 80.8%). The most common area requiring improvement for HCPs chosen by patients was more counselling time, with 62.1% (272/438), indicating this for doctors, 34.2% (150/438) for dietitians and 33.1% (145/438) for nurses, similar to the study by Lepre et al. 2023.⁵

In our first binary regression model, age was the only independent variable that was significantly associated with preference for doctors (Table 1A). Older age of patients increased the odds of preferring a doctor as the source of nutrition care, with OR 1.03 (95% CI 1.01–1.06).

In our second model on factors associated with preference for dietitian (Table 1B), age and Malay ethnicity were negatively associated with preference for dietitians. Older patients were less likely to prefer dietitians, with adjusted OR 0.95 (95% CI 0.93–0.98), and Malay patients were also less likely to prefer dietitian, with adjusted OR 0.60 (95% CI 0.37–0.98). However, patients with a monthly income of more than SGD6000 were also more likely to prefer dietitians (adjusted OR 1.69, 95% CI 1.27–4.44).

These findings highlight a potential gap between patients' preference and quality of care received—in that although the patients preferred doctors to provide nutrition care, a lower proportion of patients felt that doctors had spent sufficient time with them or that their recommendations were easy to follow as compared to dietitians or nurses.

Compared to younger patients, older patients were more likely to prefer doctors to provide nutrition care, possibly due to lower health literacy, evident in a Singapore study by Asharani et al. in 2021.⁷ This may lead to lower awareness of the role of dietitian or nurses in providing nutrition care.

Conversely, patients with higher income of more than SGD6000 were more likely to prefer dietitians, possibly following higher health literacy and awareness of the role of dietitians. We are uncertain about the clinical significance of the association between Malay ethnicity and low preference for dietitian. Further research can explore this association.

To reduce the gap in nutrition care, consultation time of doctors can be increased to dedicate more time to nutrition care and training. Improving awareness of the professional profile and the value-added services of dietitians and nurses in Singapore while increasing patients' accessibility to their services, such as by allowing patients to book consultations with dietitians and nurses directly without requiring a referral from a doctor is crucial. The far-reaching value-added services of dietitians from the clinical setting, such as in providing personalised dietary assessments to dispensing impactful everyday management of food preparation and planning (e.g. through nutrition workshops and cooking demonstrations), can be further publicised. We should also leverage the strength of multidisciplinary teams, and healthcare organisations can consider adopting the Exploration, Preparation, Implementation, Sustainment framework to improve nutritional care delivery service.⁸ Given time constraints faced by doctors, more can be done to publicise the existing tele-nutrition consultation provided by dietitians and tap into mobile phone applications to provide nutrition care.

Singapore's primary care and insurance models could work towards providing increased inclusivity for direct dietitian referrals, extended appointment slots and tele-nutrition. Under a value-based care model, for patients with metabolic risk factors, we could consider a primary care or insurance model that includes a bundled consultation payment model. This could include both a medical doctor and dietitian co-consultation with extended appointment slots, which can be done face-to-face or via teleconsultation.

With the increasing burden of metabolic diseases, nutrition care provided by various HCPs should be optimised to achieve better health outcomes. Further

Table 1. Variables associated with patients' preference for (A) doctors and (B) dietitians, and baseline characteristics of patients (n=438).

Characteristics	Unadjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value
(A) Preference for doctors				
Older age (23–83 years)	1.04 (1.02–1.06)	<0.001	1.03 (1.01–1.06)	<0.001
Sex				
Male (n=207)		Reference		
Female (n=231)	0.72 (0.48–1.15)	0.08	0.71 (0.49–1.05)	0.09
Ethnicity				
Chinese (n=248)		Reference		
Malay (n=136)	0.95 (0.63–1.44)	0.81	1.01 (0.66–1.55)	0.95
Indian (n=47)	0.75 (0.40–1.39)	0.36	0.76 (0.47–1.44)	0.43
Others (n=7)	0.15 (0.02–1.29)	0.09	0.17 (0.02–1.49)	0.11
Chronic conditions				
Hyperlipidaemia (n=311)		Reference		
Hypertension (n=299)	0.82 (0.64–1.32)	0.41	0.81 (0.62–1.24)	0.33
Diabetes mellitus (n=252)	1.21 (0.86–1.46)	0.62	1.16 (0.84–1.33)	0.61
All 3 chronic conditions (n=163)	0.93 (0.81–1.25)	0.47	0.92 (0.37–1.24)	0.43
Educational level				
Secondary level education and below (n=197)		Reference		
Post-secondary level education and above (n=241)	1.32 (0.81–1.62)	0.84	1.24 (0.79–1.57)	0.78
Household income per month				
Below SGD2000 (n=48)		Reference		
From SGD2000–5999 (n=136)	1.41 (0.71–1.63)	0.47	1.52 (0.73–1.91)	0.45
More than SGD6000 (n=182)	1.13 (0.5–1.54)	0.83	1.25 (0.62–1.71)	0.89
(B) Preference for dietitians				
Older age (23–83 years)	0.95 (0.93–0.97)	<0.001	0.95 (0.93–0.98)	<0.001
Sex				
Male (n=207)		Reference		
Female (n=231)	1.23 (0.82–1.82)	0.32	1.38 (0.90–2.11)	0.14
Ethnicity				
Chinese (n=248)		Reference		
Malay (n=136)	0.67 (0.42–1.06)	0.08	0.60 (0.37–0.98)	0.04
Indian (n=47)	1.01 (0.53–1.94)	0.97	0.95 (0.47–1.89)	0.88
Others (n=7)	4.47 (0.85–23.49)	0.08	2.87 (0.50–16.37)	0.24
Chronic conditions				
Hyperlipidaemia (n=311)		Reference		
Hypertension (n=299)	1.02 (0.61–1.71)	0.94	1.17 (0.68–2.03)	0.57

Table 1. Variables associated with patients' preference for (A) doctors and (B) dietitians, and baseline characteristics of patients (n=438). (Cont'd)

Characteristics	Unadjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value
Diabetes mellitus (n=252)	0.88 (0.54–1.44)	0.62	1.16 (0.68–1.96)	0.59
All 3 chronic conditions (n=163)	0.70 (0.18–2.77)	0.61	1.16 (0.24–5.59)	0.85
Educational level				
Secondary level education and below (n=197)		Reference		
Post-secondary level education and above (n=241)	2.20 (1.46–3.33)	<0.001	1.70 (0.96–3.01)	0.07
Household income per month				
Below SGD2000 (n=48)		Reference		
From SGD2000–5999 (n=149)	3.14 (1.32–7.49)	<0.01	2.66 (1.07–6.58)	0.28
More than SGD6000 (n=241)	3.43 (1.48–7.97)	<0.01	1.69 (1.27–4.44)	0.03

CI: confidence interval; OR: odds ratio; SGD: Singapore dollar

P values in bold are statistically significant.

research is needed to explore the format, duration, content and type of HCP nutritional counselling that should be tailored to patients' age, goals of care, level of health literacy, disease complexity, stages of changes and lifestyle priorities.

Supplementary materials (available online)

Table S1. Summary of sociodemographic data of patients.

Fig. S1. Factors affecting patients' preferences as well as perceptions towards nutrition care provided by healthcare professionals.

Appendix S1. Sample of the research questionnaire.

Ethics statement

Ethics approval was obtained from the National Healthcare Group Domain Specific Review Board (DSRB Reference: 2022/00855).

Declaration

The authors declare there are no affiliations with or involvement in any organisation or entity with any financial interest in the subject matter or materials discussed in this manuscript.

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