

## Metabolic Syndrome and Cardiac Preventive Care: Nurses' Knowledge, Attitudes and Perceived Barriers

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### Abstract

Metabolic syndrome (MetSyn), a clustering of specific risk factors for cardiovascular disease and diabetes, is considered a growing worldwide epidemic. Effective cardiac preventive care requires nurses to know about the risk factors, assessment components and management of MetSyn. This study aimed to examine the metabolic syndrome knowledge level of registered nurses and explore their attitudes and perceived barriers towards related cardiac preventive care. Three hundred and twenty four nurses completed the questionnaires. Findings suggested that while nurses possessed an understanding of MetSyn risk factors and management goals, knowledge on its diagnostic components and therapeutic lifestyle intervention was insufficient. Nurses' positive attitudes towards their role in providing MetSyn related cardiac preventive care were revealed. However, nurses generally felt that the major barrier to fulfilling this intended role is their inadequate knowledge.

**Keywords:** Metabolic syndrome; cardiac preventive care; knowledge; attitudes; perceived barriers

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## **1. Introduction**

Metabolic syndrome, a clustering of specific risk factors for cardiovascular disease (CVD) and diabetes, is considered a growing worldwide epidemic. The National Cholesterol Education Programme Adult Treatment Panel III guidelines highlighted the key features of MetSyn as having a derangement in any three of five metabolic functions, namely abdominal fat distribution, blood pressure, high density lipoprotein level, blood sugar, and triglyceride level [1]. MetSyn was found to confer additional CVD risk and mortality beyond these separate metabolic derangements [2, 3]. Because of this, MetSyn has been identified as a target in preventive cardiology where health education and therapeutic lifestyle modification remains the cornerstone for cardiac preventive care [1].

Effective cardiac preventive care requires nurses to know about the risk factors, assessment components and management of MetSyn. However, to date, a search of CINAHL, Ovid, PubMed and Medline using the key words 'metabolic syndrome', 'knowledge', 'prevent\*', 'management', 'treatment', 'attitude', 'nurs\*', 'health professional' revealed no research that reports nurses' knowledge about MetSyn. The present study was conducted to address this gap and to examine nurses' attitudes to MetSyn and related cardiac preventive care.

## **2. Methods**

### *2.1. Setting and subjects*

This cross-sectional survey recruited registered nurses by convenience sampling from six hospitals in Hong Kong (five regional public and one private). To be eligible for the study, nurses had to be registered nurses and working full-time in medical or surgical units, outpatient departments or community health nursing units. Nurse educators and nurse administrators were excluded because their major role was not focused on day-to-day patient care.

### *2.2. Instruments*

Data were collected using self-reported questionnaires. Nurses' knowledge levels were assessed by close-ended questions using 'true', 'false' or 'don't know', modified from the MetSyn knowledge questionnaires of Becker et al. [4] and Lewis et al. [5]. Twelve questions assessed MetSyn knowledge. Twenty questions assessed separate metabolic derangement components, namely central obesity (6 questions), dyslipidaemia (4 questions), hyperglycaemia (4 questions) and hypertension (6 questions). Correct responses were assigned a score of one, and incorrect or 'don't know' responses a score of zero. The percentage of correct responses was expressed as a 'knowledge score'.

Nurses' attitudes were examined by using seven closed-ended questions rated on a five-point Likert scale (1=strongly disagree to 5=strongly agree). Supplementary open-ended questions were developed to obtain the respondents' narrative opinions.

The questionnaire was tested for content validity by an expert panel of five (CVI=0.9), test re-test reliability from 30 final year nursing students (spearman Rho  $r=0.88$ ) and internal consistency (Cronbach's  $\alpha=0.78$ ).

### *2.3. Data collection procedure*

After ethical approval, the self-reporting questionnaires together with a detailed information sheet were distributed to nurses. To avoid perceived coercion, nurses were asked to return the completed questionnaires, on a voluntary basis, to a locked collection box. The questionnaires were anonymous. No personal information was obtained.

### *2.4. Sample size calculation and data analysis*

On the basis of an average hypothesized prevalence of MetSyn knowledge, the needs ranged from 60% to 80%, suggesting that 300 subjects would be sufficient to give a precision of  $\pm 5\%$  at 5% level of significance. SPSS

version 19.0 was used. The percentages of correct responses were calculated for each component. One-way ANOVA was performed for  $\geq 3$  groups comparison.

### 3. Results and discussion

Three hundred and twenty four completed questionnaires were returned (response rate=77.1%). The respondents' demographic characteristics are presented in Table 1.

Table 1: Respondents' demographic characteristics and knowledge score (N=324)

<b>Demographic variables</b>	
Gender Female (85.2%); Male (14.2%)	
Age groups – years (missing = 4) 21-25 (21.3%); 26-30 (21.6%); 31-35 (30.2%); 36-40 (14.1%); >40 (12.5%)	
Educational Background Higher diploma (18.5%); Bachelor degree (70.1%); Postgraduate diploma / Master (11.4%)	
Years of working experience < 1 year (12.0%); 1-5 years (22.5%); 6-10 years (27.8%); >10 years (37.6%)	
Work location Medical (34.4%); Surgical (20.1%); Mixed (medical/surgical) (33.3%); Out-patient Department/Community/Others (12.0%)	
<b>Knowledge scores<sup>1</sup> on MetSyn and separate metabolic derangement conditions</b>	
	<b>Mean (sd)</b>
Hyperglycaemia	93.06 (14.12)
Dyslipidaemia	86.07 (15.24)
Hypertension	71.36 (18.37)
Central obesity	66.41 (17.02)
Metabolic Syndrome <sup>2</sup>	62.87 (22.32)
<b>Knowledge scores<sup>1</sup> on MetSyn components</b>	
	<b>Mean (sd)</b>
Risk factors	65.10 (23.99)
Diagnostic components	50.36 (17.74)
Management goals	70.18 (37.39)
Therapeutic lifestyle modification	53.73 (34.12)

<sup>1</sup> Knowledge score was calculated by (No. of correct response/No. of questions) x 100%

<sup>2</sup> A statistically significant mean score difference was found among respondents of different educational backgrounds. Those with higher academic qualifications had a higher knowledge score (One-way ANOVA F=4.69, df=2, p=0.01)

#### 3.1. Nurses' knowledge of metabolic syndrome

Respondents' mean knowledge score for MetSyn was 62.87 ( $\pm$  22.32). 78% of respondents correctly identified the association between MetSyn and the increased risk of developing CVD. As shown in Table 1, the mean MetSyn knowledge score was the lowest compared with the separate metabolic derangement conditions. Among the individual MetSyn knowledge components, respondents had lowest mean knowledge score in therapeutic lifestyle modification, followed by MetSyn diagnostic components (Table 1). MetSyn knowledge scores differed

significantly with nursing education background ( $F=4.69$ ,  $df=2$ ,  $p=0.01$ ), but no statistically significant difference was found in respondents with different work locations and years of experience.

### *3.2. Nurses' attitude and perceived barriers*

Nearly 90% of respondent agreed that nurses have responsibility in providing cardiac preventive care to the MetSyn high risk group. However, only 34% respondents agreed that they were knowledgeable enough to give MetSyn related health education. 72% of them indicated a need to strengthen their MetSyn knowledge for cardiac preventive care.

Among the 467 narrative responses, 189 (58.3%) commented on nurses' attitudes towards participation in preventive cardiac care; 114 (35.2%) on perceived facilitating factors and 164 (50.6%) on perceived barriers. Consistent with findings from closed-ended questions, a positive attitude towards the nurses' roles in preventive cardiac care was revealed. The perceived facilitating factors included that nurses recognized their clinical roles in health education. The most commonly addressed hindering factors included knowledge insufficiency, heavy workload, and a lower priority given to preventive care in hospital settings compared with treating and attending patients' immediate/acute health needs.

While nurses possessed an understanding of MetSyn risk factors and management goals, knowledge on its diagnostic components and therapeutic lifestyle intervention was insufficient. Nurses' positive attitudes towards their role in providing MetSyn related cardiac preventive care were revealed. However, nurses generally felt that the major barrier to fulfilling this intended role is their inadequate knowledge. Several knowledge gaps were identified.

### *3.3. Limitations*

Interpretation of the results needs to take into consideration the convenience sampling method used in this study. Also, despite the relatively high response rate, no information could be retrieved about non-respondents, making it difficult to estimate differences in demographic characteristics, knowledge levels and attitudes between respondents and non-respondents.

## **4. Conclusion**

Considering the increasing MetSyn prevalence, major challenges remain for the integration of the key MetSyn features into clinical practice for effectively identifying and managing high risk population and individuals. To enhance advanced nursing practice in preventive cardiac care, there is a need to strengthen and update MetSyn knowledge in designing and updating continuous education programme and baccalaureate nursing curriculum.

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