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Hong Kong men with low incomes have worse health-related quality of life as judged by SF-36 scores

根據「整體健康調查簡短表格-36問卷」(SF-36問卷)的得分，香港低收入男性有較差的與健康有關的生活質素

Objective. To analyse the association between income and health-related quality of life using the Medical Outcome Study Short Form 36 (SF-36) Chinese version in Hong Kong Chinese working population.

Design. Cross-sectional observation study.

Setting. A commercial company in Hong Kong.

Participants. All clerical and administrative staff of a commercial company was invited to participate; 876 of the 1003 staff agreed. The subjects were categorised into three income groups according to monthly income in Hong Kong dollars (low, $\leq 10\,000$; middle, $>10\,000$ - $25\,000$; high, $>25\,000$). The mean age of the 288 men and 588 women was 34.9 (standard deviation, 7.9; median, 34.0; range, 18-71) years.

Main outcome measures. SF-36 scores on health-related quality of life.

Results. The distribution of income was 30% in high-, 54.8% in middle-, and 15.2% in low-income groups. Women had similar SF-36 scores among different income groups. In men, for most variables there was a significant positive linear correlation between income and SF-36 scores.

Conclusion. Low income is associated with a worse health-related quality of life in Hong Kong Chinese men.

目的：以 SF-36 問卷分析香港華籍工作人口，其收入與健康有關的生活質素的關係。

設計：跨部門觀察研究。

安排：香港某商業機構。

參加者：研究邀請該商業機構內的文職及行政職員參與，在 1003 名員工中有 876 人參加。參加者依其以港幣計算的每月收入分作三組（低收入，\$10 000 或以下；中等收入，\$10 000 以上至 \$25 000；高收入，\$25 000 以上）。876 人中男性有 288 人，女性有 588 人，平均年齡 34.9 歲（標準差 7.9，中位數 34.0，介乎 18-71 歲）。
主要結果測量：在 SF-36 問卷中與健康有關的生活質素項目的評分。

結果：參加者收入的分布為 30% 高收入，54.8% 中等收入，15.2% 低收入。女性在 SF-36 問卷的評分在各個收入組別相若；男性則在大部分項目中，收入與 SF-36 問卷評分有正面關係。

結論：對香港的華籍男性，低收入跟較差的與健康有關的生活質素有關係。

Introduction

Hong Kong is an affluent society with an urbanised and westernised lifestyle. Chronic medical conditions such as diabetes, obesity, and hypertension are very common in many parts of Asia including Hong Kong.^{1,2} These chronic diseases have significant adverse impacts on the quality of life (QOL). Among others, the environment is one of the most important factors influencing health-related QOL.^{3,4}

In the western literature, socio-economic status such as income has also been shown to relate to QOL.^{3,5-7} However, there has been no study on any possible association between income and QOL in Hong Kong Chinese population. We

Key words:

Asian continental ancestry group;

Hong Kong;

Income;

Quality of life

關鍵詞：

亞洲大陸血統群；

香港；

收入；

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Table 1. Clinical characteristics and distribution of income of the 876 subjects*

Parameter	Total, n=876	Women, n=588	Men, n=288	P value
Age (years)	34.9±7.9	34.5±7.5	35.5±8.5	0.077
Systolic blood pressure (mm Hg)	128±19	123±20	133±17	<0.001
Diastolic blood pressure (mm Hg)	80±11	78±11	83±10	0.001
Body mass index (kg/m ²)	21.9±3.4	21.0±2.9	23.7±3.5	<0.001
High income	263 (30.0)	127 (21.6)	138 (47.9)	<0.001
Middle income	480 (54.8)	359 (61.0)	120 (41.7)	<0.001
Low income	133 (15.2)	102 (17.4)	30 (10.4)	0.014

* Values are expressed as mean±SD or n (%) where appropriate

therefore analysed the monthly income of 876 subjects and its association with health-related QOL.

Methods

This was a cross-sectional study involving 876 subjects from a working population in Hong Kong in 2002. The study protocol was approved by the Ethics Committee of Alice Ho Miu Ling Nethersole Hospital, Hong Kong. All clerical and administrative staff of a commercial company were invited to participate; 876 of the 1003 staff agreed. All subjects were asked to complete a questionnaire and underwent a simple health check. The questionnaire was self-administered and included a validated Medical Outcome Study Short Form 36 (SF-36) Chinese version to assess health-related QOL.^{8,9} The subjects were also asked about: monthly income, occupational rank, education level, self-perception of their own health, medical history, and social background. The occupation and monthly income were verified from relevant human resources records. Other personal particulars were based on the answers from the questionnaires.

The health check included measurements of blood pressure, body weight and height. Blood pressure was measured in the right arm after at least 5 minutes of rest, using the Dinamapp machine and the Karotkoff sound V was used as the diastolic blood pressure. Body weight and height were measured with light clothing and without shoes. Body mass index (BMI) was calculated as weight (kg) divided by the square of the height (m²).

Low income

Low-income household or family is defined as annual (gross) income not exceeding 80% of the median income for the area, after adjustment for family size. According to the 2001 population census, the median monthly domestic household income in Hong Kong was HK\$18 750 with 1.5 members per household.¹⁰ Low-income cut-off was therefore defined as HK\$18 750 x 80%/1.5=HK\$10 000. The subjects were therefore classified into low-, middle-, and high-income groups depending on whether their monthly incomes were ≤HK\$10 000, >HK\$10 000 to 25 000, and >HK\$25 000, respectively.

Medical Outcome Study Short Form 36

The SF-36 consists of 36 items grouped under nine

scales: ten items on physical functioning (PF), four on role limitation due to physical problems (RP), two on bodily pain (BP), five on general health (GH), four on vitality (VT), two on social functioning (SF), three on role limitation due to emotional problems (RE), five on mental health (MH), and one on health transition (HT). The scores of the items in each scale are summated and transformed into a scale score that has a standardised range from 0 to 100. The scores can be further summarised into a mean physical component score (PCS) and a mean mental component score (MCS). Mean PCS is the mean of PF, RP, BP, and GH, while mean MCS is the mean of VT, SF, RE, MH, and HT. Higher scores indicate better QOL. These scales cover the essential domains of health-related QOL.^{11,12}

The Chinese version of the SF-36 has been validated on Chinese adults in Hong Kong.⁹ A norm reference score for Hong Kong Chinese adults has also been reported and compared with US population norms.⁹

Statistics

Statistical analysis was performed using the Statistical Package for the Social Sciences (Windows version 10.0; SPSS Inc, Chicago [IL], US). All results are expressed as mean±standard deviation or n (%) where appropriate. The Student's *t* test, and Chi squared test were used for between-group comparisons where appropriate. ANOVA with age as covariate was performed. Bonferroni post-hoc multiple comparisons were performed to assess intergroup significance. A P value of <0.05 (2-tailed) was considered significant.

Results

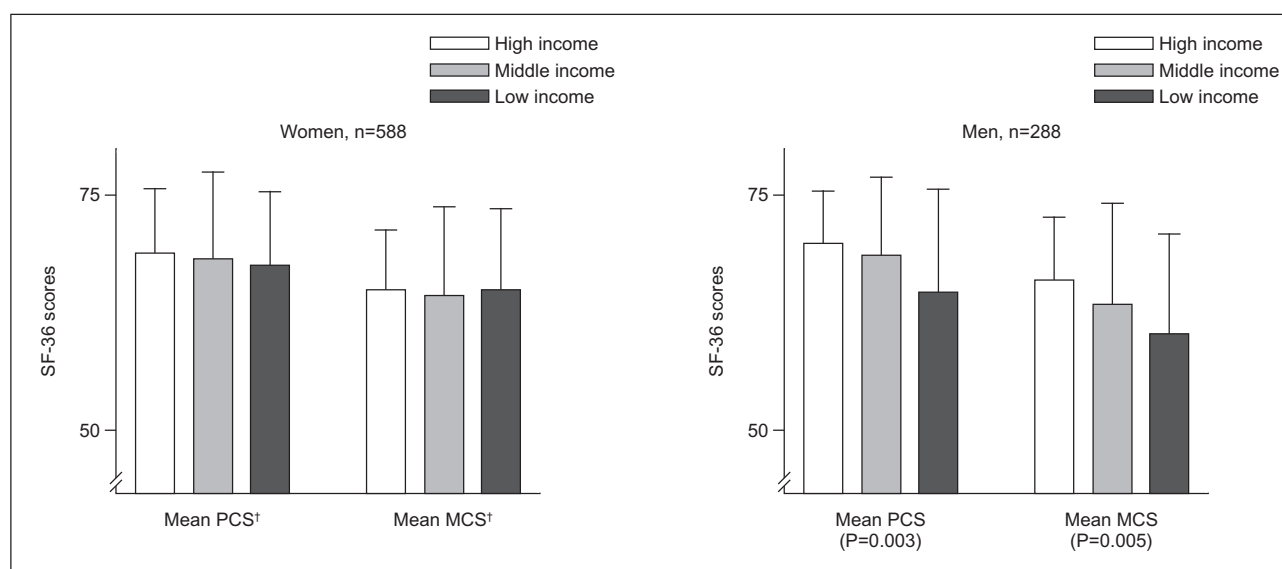
A total of 288 (33%) men and 588 (67%) women agreed to participate; the mean age was 34.9 (standard deviation, 7.9; median, 34.0; range, 18-71) years. Table 1 summarises the subjects' clinical characteristics and categorises them according to income; there being 30% in high-, 54.8% in middle-, and 15.2% in low-income group subjects. In terms of occupation, 17.9% were managerial or professional, 73.8% were non-manual workers, and 8.4% were unskilled or manual workers. In terms of education level, 50.8% finished high school or university, 47.8% finished middle school, and 1.4% were illiterate or completed elementary schooling only.

Table 2 summarises the scores of the nine scales of

Table 2. Clinical characteristics and SF-36 scale scores of the 876 subjects*

Parameter [†]	Total		Income						P value for trend after adjusting for age	
	Women, n=588	Men, n=288	High		Middle		Low		Women	Men
			Women, n=127	Men, n=138	Women, n=359	Men, n=120	Women, n=102	Men, n=30		
Age (years)	34.5±7.5	35.5±8.5	37.2±6.0	35.8±6.1	33.6±6.9	35.6±9.5	33.0±10.4	33.7±14.1	-	-
SBP (mm Hg)	123±20	132±17	122±19	131±15	123±23	133±17	127±18	130±18	0.879	0.781
DBP (mm Hg)	78±11	83±10	77±9	83±9	78±13	84±12	81±10	79±8	0.691	0.373
BMI (kg/m ²)	21.0±2.9	23.7±3.5	21.0±2.4	23.7±2.8	21.0±2.9	23.5±3.1	20.9±3.6	24.6±7.1	0.258	0.225
PF	90.3±10.1	93.3±12.5	90.4±8.4	95.0±7.7	90.0±10.5	93.6±10.8	91.0±10.8	84.2±25.9	0.407	<0.001 ^{‡§}
RP	82.6±24.4	87.5±19.3	85.1±21.8	90.6±15.1	81.9±25.8	85.8±22.7	81.7±22.1	80.6±19.1	0.376	0.012 [‡]
BP	75.7±17.9	80.1±16.6	74.6±17.5	81.1±16.6	75.3±18.1	79.6±16.9	78.4±17.3	77.8±15.8	0.284	0.805
GH	61.0±15.7	64.2±14.6	63.6±15.3	66.2±14.2	60.4±15.3	63.1±14.5	59.9±17.4	59.3±16.0	0.631	0.930
VT	60.9±16.4	62.6±15.9	61.7±16.1	63.4±13.6	60.2±16.2	62.0±17.7	62.0±17.3	61.6±18.3	0.706	0.104
SF	78.8±17.3	80.8±17.8	78.4±16.0	82.7±15.8	78.9±17.9	80.5±18.8	79.4±16.9	73.3±20.9	0.053	0.032
RE	78.4±24.2	81.2±23.1	79.6±22.0	83.5±21.1	78.3±25.8	79.0±25.5	77.4±21.1	79.6±21.4	0.928	0.268
MH	67.5±16.7	66.9±17.5	70.1±14.2	69.0±13.6	66.7±17.6	65.8±20.0	67.1±16.1	61.7±21.0	0.927	0.014 [‡]
HT	54.8±16.6	55.1±17.1	54.3±16.2	55.4±16.3	54.7±16.4	54.3±17.3	55.9±17.8	57.0±19.8	0.343	0.681

* Values are expressed as mean±SD

[†] SBP denotes systolic blood pressure, DBP diastolic blood pressure, BMI body mass index, PF physical functioning, RP role limitation due to physical problems, BP bodily pain, GH general health, VT vitality, SF social functioning, RE role limitation due to emotional problems, MH mental health, and HT health transition[‡] Significant difference between high- and low-income groups[§] Significant difference between middle- and low-income groups

* Error bars indicate standard deviation

[†] Not significant**Fig. Mean physical component score (PCS) and mean mental component score (MCS) of the 876 subjects***

SF-36 according to income groups. Age, BMI, and blood pressure were similar among different income groups except in women; those in the high-income group were older than those with lower income. Women among different income groups had similar SF-36 scores in all scales. In men, there was a significant positive linear correlation between income and SF-36 scores for most variables. The lower the income, the worse (lower) the SF-36 scores for PF, RP, SF and MH items (even after adjusting for age). The Figure shows the mean PCS and MCS of the SF-36 scale. Men in the low-income group had the lowest mean PCS and MCS, while men in the high-income group had

the highest mean PCS and MCS. Mean PCS and MCS were similar in women among different income groups.

Discussion

The present study has several major limitations. First, the sample population was female dominant with a low proportion of unskilled or manual workers. It is not representative of the working population in Hong Kong. Nevertheless, the income groups were relatively well distributed, half of the subjects being in the middle-income group. Second, the number of subjects recruited is

relatively small. Nonetheless, the differential effect of income on QOL was markedly significant only among men, suggesting the high association between income and QOL in men. A follow-up survey using a more representative and larger sample is indicated to substantiate these findings. Third, available information on other health-related variables and their outcome such as cardiovascular diseases was limited. It is important to have such details as cardiovascular risk factors as well as related morbidity may confound the relationship between income and QOL.

The 36-item SF-36 is the most commonly used health-related QOL measurement instrument throughout the world.^{8,9,13} It is applicable to people with different kinds of health conditions. It can be used as an outcome measure as well as a control variable in clinical trials.^{14,15} This generic instrument has also been used in numerous studies investigating people from different socio-economic classes.^{16,17}

There is no doubt that parameters other than income have an effect on the health-related QOL such as physical and social factors. Yet, many studies in the western societies have demonstrated a strong correlation between income and a variety of indicators of physical, psychological, and social health.^{3,5-7} Asada and Ohkusa¹⁸ have documented a significant difference in health-related QOL due to inequality in income in a Japanese population. To our knowledge, the present study is the first report on the association between income and health-related QOL among a Hong Kong Chinese population. We found a positive linear correlation between men's income and many health-related QOL variables such as PF, RP, SF, MH, as well as the overall mean PCS and MCS.

Hong Kong Chinese women did not show any significant association between health-related QOL and income. This may be due to the small sample size or a cultural phenomenon; for women occupational status and income level might be less important than for men. In Chinese society, men are regarded as bread-winners of the family and high income is a symbol of success. This may adversely affect the psychological aspects of health in Chinese men and contribute to a worse QOL.

We have previously reported that a low socio-economic status (based on education level and occupation) is a risk factor for glucose intolerance in a Hong Kong Chinese population.¹⁹ Our findings, together with others, suggest that the affluence of the country, social class, and income of the population may interact with factors such as ethnicity, ageing, and family history.^{20,21} It is evident that the gap between rich and poor is growing in most countries. Therefore, to improve the cost-effectiveness of a health screening and prevention programme, low-income populations should be targeted.

Conclusion

Low income is associated with a worse health-related QOL in Hong Kong Chinese men. The association between income and QOL among Hong Kong Chinese women is unclear. Our findings indicate that subjects with low income should be targeted for health education and screening, especially in the presence of other risk factors.

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