Project Title:	Health Profiling of Construction Workers in Hong Kong - A Second Phase Study
Principal Investigator:	Prof. Albert CHAN
Project ID:	CICR/02/17
Research Institution:	The Hong Kong Polytechnic University
Subject Area:	Construction Safety and Health

Objective

♦ To expand the study from general physical health to a more comprehensive health profiling, covering blood chemistry, lifestyle behaviours, psychological health and health literacy;

♦ To establish a database of the general health conditions of construction workers, both physically and psychologically;

♦ To evaluate how the demographic variables affect the health profiling of construction workers;

♦ To identify and recommend intervention measures for improving the physical and psychological health of construction workers; and

♦ To monitor and evaluate how these intervention measures improve the health conditions of construction workers longitudinally.

Background

The construction workforce in Hong Kong is ageing and in severe shortage. To tackle this problem, it is crucial to retain the existing workforce and at the same time to recruit more new blood by improving our industry's image. However, work-related health problems can cause loss of ability of work and early retirement, which impair the well-being of the current workforce and make young people reluctant to join the industry. Therefore, it is of utmost importance to detect health problems of construction workers and develop corresponding preventive measures. The first phase of the study conducted between 2014 and 2016 initially established a database of health profile of construction workers. Based on the first phase of the research conducted by the research team, unhealthy lifestyle could be one of factors inducing cardiovascular problems. In addition, one quarter of the workers interviewed suffered musculoskeletal pain, where the most frequent painful parts occurred in the lower back, shoulder, knees, leg, and neck. The key findings of the pilot study revealed that some lifestyle behaviours (e.g., alcohol intake, smoking, inadequate intake of fruit and vegetables) may affect the cardiovascular health, while physical activities may prevent and relieve the musculoskeletal pain symptoms. The aim of the current study is to carry out a more in-depth assessment of the physical and mental health conditions of construction workers in a much larger scale and at the industry-wide level, and to formulate health promotion programmes to improve their quality of life.

Methodology

Face-to-face interviews with the construction workers and medical examination of their health conditions were conducted at 126 construction sites. The measurements included:

♦ Bio-measurement: body height, weight, peak expiratory flow rate (PEFR), resting heart rate, and blood pressure;

♦ Blood chemistry: fasting blood glucose (FPG) or random blood glucose (RPG), total cholesterol, liver function (ALT/AST), uric acid, and renal function (urea);

♦ Socio-demography: age, gender, work experience in construction, ethnic, educational attainment, work hours/days, overtime (OT), number of depending family members, payroll method;

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- Lifestyle: sleeping hours, dietary habits, alcohol drinking habit, current smoking status, stretch before/after work, physical activity;

- History of work-related illnesses/accidents: heat-related symptoms, construction accidents;

- Pain: pain spots, pain relief methods, pain effects;

- Health literacy;

- Self-rated health status (SF-12v2).

Results and Findings

The key findings of the research are summarised below:

Health risk of work trades:

- Ethnic minorities and plant operators had a high BMI.

- "Other" trade group (except general labour, building services workers, plant operators, and the three major trades) tended to have a high cholesterol level.

- General labour had a lower PEFR after controlling age, BMI and gender.

- Pain was most the prevalent in the three major work trades (bar fixing and bending, formwork, concrete), followed by building services and general labour.

- Back and knees were the worst pain spots reported by all construction workers.

- For carpenters and rebar workers, the worst and the top most common pain spots were the extremities. Waist pain problems of rebar workers were remarkable.

- The prevalence of worse physical health status of rebar and formwork workers was among the highest. However, for mental health the reverse was observed.

Health risk of male construction workers:

- Male workers had a higher likelihood of prehypertension and hypertension.

- The prevalence of hyperuricaemia was higher in male workers.

- Mental health of male workers was worse than female workers.

- Role physical, vitality, social function, role emotional, and mental health of male workers were worse than those of the general male population.

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Health risk of female construction workers:

* The prevalence and the likelihood of reduced PEFR were significantly higher in female workers.

* The prevalence of impaired liver function was higher in female workers.

Health risk of higher educational attainment:

* Workers with post-secondary education had a higher likelihood of worse mental health than those with lower educational attainment.

Health risk of age:

* The prevalence of younger (25 yrs old below) and older workers (54 yrs old above) with worse physical health but better mental health was higher than the middle age groups (25-54 age groups).

Health risk of BMI:

* Increasing BMI was associated with the likelihood of prehypertension and hypertension.

* The prevalence of obesity (overweight and obese) of construction workers was higher than that of the general population.

Health risk of longer years of working in construction:

* Pain and prehypertension of workers were associated with their longer years of working in construction.

Health risk of alcohol drinking and smoking habits:

* The prevalence of daily smoking and daily alcohol drinking of construction workers was higher than that of the general population.

* Weekly alcohol drinking quantity was associated with a high likelihood of hypertension.

* Heavy alcohol drinkers (i.e. ≥ 3 standard drinks per day) had a higher likelihood of high cholesterol than moderate drinkers (i.e. ≤ 2 standard drinks per day).

* Heavy alcohol drinkers (i.e., ≥ 3 standard drinks per day) had a higher likelihood of worse mental health than non-alcohol drinkers.

Health risk of insufficient leisure-time physical activity:

* Workers who did leisure-time physical activity less than once per week had a higher likelihood of a reduced PEFR.

* Insufficient leisure-time physical activity was associated with a higher likelihood of worse physical and mental health.

Health risk of pain:

⬥ Pain was significantly associated with a higher likelihood of worse physical and mental health.

Health risk of inadequate health literacy:

⬥ Inadequate health literacy was associated with lower mental component summary scores.

Health benefits:

⬥ Longer sleep duration could reduce the likelihood of pain.

⬥ Longer sleep duration could increase the likelihood of better physical and mental health status. It implies that longer duration of recovery periods between working days could improve workers' physical health.

Longitudinal comparison between the two health profile (2014 and 2019) studies:

⬥ Some lifestyle behaviours and health conditions were slightly improved in the second study: warm up or stretching before work, cool down or stretching after work, doing physical activity, non-smoking, non-hypertension, and no pain,

⬥ Some lifestyle behaviours and health conditions were deteriorated in the second study: inadequate fruit, vegetable, and dairy consumption, excessive alcohol consumption, and high cholesterol.

⬥ No remarkable difference in the two health profile studies was noted: over 60% of workers were overweight or obese.

⬥ In the future health profile studies, it is expected that with the nutrition and post-work stretching exercise programmes launched, dietary habits would improve, and the proportion of workers undertaking cooling down or stretching after work would increase, and hence the prevalence of pain would reduce.

Recommendations

The current study offers a better understanding of the physical and mental health of construction workers. The study has detected some health problems of construction workers and formulated specific health promotion programmes. The two health profile (2014-2016 and 2017-2019) studies have provided initial longitudinal information about workers' health status. It is expected that a CIC Health Index (Physical-Mental Health Index) will be developed in the third health profile project which will be submitted to CIC for consideration upon completion of the current project. The benefits of the provision of an integrated health index are: (1) to establish a database to quantify the health status of construction workers, (2) to offer a benchmark to the whole industry, and (3) to assess workers' health patterns longitudinally.