

**ASSESSMENT OF RISK FACTORS FOR EXCESS WEIGHT
GAIN AND DEVELOPMENT OF OBESITY IN PRESCHOOL
CHILDREN IN HO CHI MINH CITY, VIETNAM**

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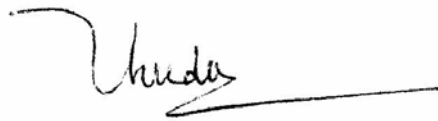
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DECLARATION

I hereby certify that the work embodied in this thesis is the result of original research and has not been submitted for a higher degree to any other university or institution

Signed

A handwritten signature in black ink, appearing to read 'Huynh Thi Thu Dieu', with a long horizontal line extending to the right.

HUYNH Thi Thu Dieu

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Thesis Publications

Huynh Thi Thu Dieu, Michael J. Dibley, David Sibbritt, Tran Thi Minh Hanh. Prevalence of overweight and obesity in preschool children and associated socio-demographic factors in Ho Chi Minh City, Vietnam. *International Journal of Pediatric Obesity*. 2007; 2: 40-50

This paper is an extract from Chapter 4 of the thesis.

Huynh Thi Thu Dieu, Michael J. Dibley, David W. Sibbritt, Tran Thi Minh Hanh. Trends in overweight and obesity in pre-school children in urban areas of Ho Chi Minh City, Vietnam, from 2002 to 2005. *Public Health Nutrition*. Accepted 2 May 2008.

This paper is an extract from Chapter 5 of the thesis.

Thesis Communications

Dieu Thi Thu Huynh, Michael J. Dibley. Prevalence, trend and risk factors for preschool children overweight and obesity in Ho Chi Minh City, Vietnam. Oral presentation at the School of Public Health seminar, the University of Sydney, 23, July 2007

This presentation is extracted from Chapters 5 and 8 of the thesis.

Abbreviations

The following abbreviations are used in this thesis:

HCMC:	Ho Chi Minh City
BMI:	Body mass index
WHO:	World Health Organisation
IOTF:	International Obesity Task Force
CDC:	Center for Prevention and Disease Control in USA
SES:	Socio-economic status
PR:	Prevalence ratio
RR:	Relative risk
95% CI:	95% confidence interval
FFQ:	Food frequency questionnaire
PPS:	Proportionate to the Population Size
UNICEF:	United Nation Children's Fund
DEXA:	Dual energy X-ray absorptiometry

Synopsis

Introduction: Surveillance data and other studies have indicated that the prevalence of overweight and obesity in preschool children in Ho Chi Minh City (HCMC) is increasing, particularly in urban areas. No studies have examined the speed at which this public health problem is emerging in child populations in urban Vietnam. Knowledge of the risk factors for preschool-aged child obesity is limited since earlier studies have been cross-sectional in design and potential risk factors at different levels have not been fully investigated.

Objectives: This study aimed to assess the prevalence and trends in overweight and obesity, and to identify the risk factors associated with longitudinal changes in adiposity over a one year period in preschool children in urban areas of HCMC. In addition, a sub-study aimed to validate a proxy-questionnaire for use in measuring physical activity of preschool children.

Method: Based on the available data from a cross-sectional study conducted with preschool children in HCMC in 2002, a restricted sample of 492 children aged four to five years from urban areas of HCMC was used for examining the trends in overweight and obesity in this child population, over the period from 2002 to 2005. The original study using the multi-stage cluster sampling was performed in preschool children aged one to six years in both urban and sub-urban areas of HCMC. A total of 1780 children aged one to six years participated in this study. Anthropometry of the subjects was measured using standard methods. Socio-demographic information was collected using a self-administered questionnaire.

The one year follow-up study, using multi-stage cluster sampling, was conducted from 2005 to 2006 with children aged four to five years in preschools in urban areas of HCMC. At baseline, 670 children participated in the study and of these, 526 children completed two follow-up measurements at 6 month intervals. Information on neighbourhood, preschool and home environments, socio-economic status, the child's and parental characteristics were collected using pre-coded, structured, interviewer-administered questionnaires. Dietary intake and physical activity were measured in the home and preschool settings using modified, validated questionnaires. Anthropometry including weight, height, skinfold thickness at triceps, subscapular and suprailiac sites were measured using standard methods.

The trends in overweight and obesity were examined based on data from the 2002 study and the baseline study of the cohort study. Data were collected in 2002 and made available for these secondary analyses.

The validation study of the proxy-questionnaire to measure physical activity of children aged four to five years was conducted from July, 2005 to November, 2005, using accelerometers as the criterion method. A subset of 83 children from the entire cohort study participated in this study. Physical activity data over the three months, reported by the teacher and the parents, were compared with data collected from the accelerometers for seven consecutive days.

Main outcomes: Body mass index (BMI) was calculated from measured weight and height. Overweight and obesity were defined using IOTF cut-off points. Underweight was

classified using the 5th percentile cut-off point for weight for age, based on the 2000 CDC Growth Reference.

Results: The findings indicated that the significance of overweight and obesity in preschool children in urban areas of HCMC is not only in its magnitude (obverweight: 20.5% and obesity: 16.3% in 2005), but also in the rapidly increasing trend in prevalence from 21.4% in 2002 to 36.8% in 2005.

There exists an imbalance in food intake in this young child population. Dietary patterns have shifted towards higher energy obtained from protein and fat (particularly animal protein and fat) and less energy from carbohydrates, than is recommended.

The risk factors of overweight and obesity in the four to six year old child population in HCMC were identified at multiple levels. The contextual variables in the community, school and home environments, interacted with individual characteristics influencing the changes in adiposity and overweight and obesity development over time. Risk factors for changes in adiposity and risk of developing overweight and obesity differed for boys and girls.

The proxy-questionnaire was shown to be valid for ranking the child's sedentary behaviour but it was not suitable for measuring the child's physical activity patterns in absolute values.

Conclusion: An obesity epidemic has been taking place in the young child population in urban areas of HCMC. Boys appear to be more vulnerable to this epidemic than girls. The diet of this child population has shifted to higher energy from protein and fat, and less energy from carbohydrate. The aetiology of overweight and obesity of preschool children is

multi-factorial. It is time for action to control this public health problem in young children in urban areas of HCMC, Vietnam.