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## RESEARCH ARTICLE

### A PILOT-TESTING STUDY OF MULTICULTURAL LIFESTYLE CHANGE QUESTIONNAIRE IN OTTAWA AND GATINEAU, CANADA

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#### ABSTRACT

A Multicultural Lifestyle Change Questionnaire that included English, French and Chinese versions which was developed by Ning Tang was pilot-tested in 98 English, French and Chinese speaking immigrants in two adjacent cities (Ottawa and Gatineau) of Canada. The participants were recruited by a purposive sampling and answered the questions in the questionnaire with self-reporting. The pilot-testing results exhibited that the questionnaire had higher validity (face validity, content validity, criterion-related validity and construct validity) and reliability (test-retest reliability). After being revised appropriately, the questionnaire could be used in multicultural lifestyle changes surveys in full population and more wide use.

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#### INTRODUCTION

As immigrant population grew and influence of immigrant lifestyle change enlarged on health status in the immigrant countries (i.e. Canada), it is necessary to do more integrated and larger-scale research concerning health and lifestyles associating with immigrants (Méjean 2007). Obviously, one of the most effective ways to identify the immigrant lifestyle and health status changes was through the use of lifestyle questionnaire survey (Charnley 2008), which needed a valid and reliable multicultural lifestyle change questionnaire. At present, though some of health survey researchers have constructed some questionnaires for different cultures and used them in some of multicultural health surveys, public health surveys still lack valid and reliable multicultural measurement instruments to assess lifestyle and health status changes in diverse cultural immigrant sub-groups (Vereecken 2010). Therefore, a trilingual multicultural lifestyle questionnaire was developed by Ning Tang for the multicultural lifestyle change survey. However, validity and reliability of the multicultural instrument had to be evaluated before it was used in the survey. A pilot study is usually conducted in order to evaluate validity,

reliability and other characteristics of the designed questionnaire (Luepker 2004, Dillman 2007, SC 2010). Thus, a pilot-testing study of the Multicultural Lifestyle Change Questionnaire was performed in the target population (English, French and Chinese speaking immigrants) in order to evaluate validity and reliability of the questionnaire.

#### MATERIALS AND METHODS

##### Pilot-Testing Method

English, French and Chinese speaking immigrants of the first generation at Adult Educational Centres/Schools, Community Churches and Residential Communities in Gatineau and Ottawa were identified as the pilot-testing sampling population. The immigrant participants must have been 18 years or older, have resided in Ottawa or Gatineau one year or more, and had been 16 years or older when they arrived in Canada. At least 90 immigrants (not less than 20 subjects for each sub-group of English, French and Chinese immigrants) in the two cities were recruited as the pilot-testing participants of the multicultural lifestyle change questionnaire. The sample size was based on the sampling recommendation of Dillman – about 100 subjects for a pilot study (Dillman 2007), and the general recommendation of Altman - at least 50 subjects for a pilot-testing (Altman 1999, Ekeberg 2008). Random sampling was

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deemed impracticable for the study and could be biased because immigrant status of three language sub-groups could not be identified effectively according to the sampling criteria. Purposive-sampling methods were applied in the study to recruit qualified immigrant participants. The paper-and-pencil mode of self-administered questionnaire completed in the presence of research staff was employed to administration of the pilot-testing data collection of the multicultural questionnaire (Tang 2008).

### Analysis Method of Validity and Reliability

Face validity and content validity of the multicultural questionnaire were assessed respectively by inspection of pilot-testing subjects and review of experts (Wikipedia 2010); criterion-related validity was assessed statistically by Pearson correlation coefficient value (0.4 or higher Pearson correlation coefficient for satisfactory validity) (Eshaghi 2006, Ekeberg 2008). Construct validity was evaluated statistically by alpha coefficient value (0.7 or higher Cronbach's alpha coefficient for satisfactory construct validity) (Garson 2010, Eshaghi 2006). Test-retest reliability of the multicultural questionnaire was assessed statistically by alpha coefficient value (0.7 or higher Cronbach's alpha coefficient was regarded as acceptable test-retest reliability) (Grau 2007, Hopkins 2010, Garson 2010, Luban 2010).

### Ethical Approval

The pilot-testing study of the Multicultural Lifestyle Change Questionnaire was part of a multicultural lifestyle change research project that was approved by Social and Behavioural Research Ethics Committee, Flinders University in Australia in 2010.

## RESULTS AND DISCUSSION

In total, 98 qualified immigrant participants (respectively 24, 40 and 34 subjects for English, French and Chinese speaking immigrants) in Ottawa and Gatineau, Canada were recruited by a purposive sampling to the pilot-testing study. Using self-reporting, they answered questions of Smoking Change, Alcohol Consumption Change, MoodChange, SleepChange, Physical ActivityChange, Dietary Change, Health Status Change and Demography in the multicultural lifestyle change questionnaire (pilot-testing) of English, French or Chinese versions, twice, 2 weeks apart. The survey data showed that all of questions in three versions of the Multicultural Lifestyle Change Questionnaire for the pilot-testing could be understood equally and completed easily by English, French and Chinese speaking immigrants. Three versions of the Multicultural Lifestyle Change Questionnaire for the pilot-testing were affirmed by multicultural research experts, questionnaire design specialists, and bilingual teachers or specialists. The results of Pearson coefficient calculation for criterion-related validity analysis and alpha coefficient calculation for test-retest reliability analysis were presented in the Analysis Result Table of Validity and Reliability.

According to inspection of the pilot-testing immigrants of the three language sub-groups, and assessment of the research experts and specialists, the pilot-testing questionnaire had higher face validity and content validity.

Criterion-related validity of a questionnaire may be assessed by Pearson correlation coefficient (Eshaghi 2006, Ekeberg 2008). General criterion-related validity of the multicultural lifestyle change questionnaire should be assessed by most of the Pearson correlation coefficients and the average Pearson

Analysis Result Table of Validity and Reliability

Criterion-related validity			Test-retest reliability		
Item	Dependent variable	*Pearson correlation coefficient (r)	Item	Smoking behavior change	**Cronbach's alpha coefficients ( $\alpha$ )
Independent variable Gender	Smoking change	-0.473	Smoking change	Smoking behavior change	0.842
	Alcohol consumption change	-0.427	Alcohol consumption change	Smoking belief change	0.892
	Mood change	-0.393		Alcohol consumption behavior change	0.883
	Sleep change	-0.387		Alcohol consumption belief change	0.919
	Physical activity change	0.462	Mood change	Mood status change	0.711
Mother tongue	Dietary change	0.362	Mood change	Mood belief change	0.724
	Health status change	0.369	Sleep change	Sleep behavior change	0.759
	Smoking change	0.373	Sleep change	Sleep belief change	0.685
	Alcohol consumption change	0.358	Physical activity change	Physical activity behavior change	0.680
	Mood change	0.456		Physical exercise belief change	0.675
Category of immigration	Sleep change	0.463	Dietary change	Dietary behavior change	0.642
	Physical activity change	0.483		Dietary belief change	0.708
	Dietary change	0.464	Health status change	Health status change	0.683
	Health status change	0.482		Average ( $\bar{\alpha}$ )	0.754
	Smoking change	0.545			
	Alcohol consumption change	0.457			
	Mood change	0.418			
Sleep change	0.378				
Physical activity change	0.468				
Dietary change	0.525				
Health status change	0.388				
Average ( $\bar{r}$ )		0.435	Average ( $\bar{\alpha}$ )		0.754

Notes: \*Pearson correlation coefficient  $r > 0.40$ ; \*\*Cronbach's Alpha coefficients  $\alpha > 0.70$ .

correlation coefficients instead of the single Pearson correlation coefficient, because the questionnaire was an integrated questionnaire which included many independent and dependent variables. It was unreasonable that the single Pearson coefficient was applied in assessing criterion-related validity of the integrated questionnaire. Most of the Pearson coefficients and the average Pearson coefficient were over 0.40, which showed that the multicultural questionnaire had higher criterion-related validity (Eshaghi 2006, Ekeberg 2008).

Construct validity might be also expressed as reliability (correlation) (Westen2003, Smith 2005). Cronbach's alpha coefficient to evaluate reliability may be used to assess construct validity. Most of the alpha coefficients and average alpha coefficient were over 0.70, which showed that the multicultural questionnaire had higher construct validity (Hopkins 2010).

Test-retest reliability of a questionnaire can be assessed by Cronbach's alpha coefficient (Eshaghi 2006, Ekeberg 2008). General test-retest reliability of the multicultural questionnaire should be assessed by most of the alpha coefficients and the average Cronbach's alpha coefficient instead of the single alpha coefficient, as it was also unreasonable that the single alpha coefficient was used in assessing test-retest reliability of the integrated questionnaire. Most of the alpha coefficients and the average alpha coefficient were over 0.70, which exhibited that the multicultural questionnaire had higher test-retest reliability (Grau 2007, Hopkins 2010).

## Conclusion

Consequently, integrated analysis results disclosed that the unique multicultural lifestyle change questionnaire had higher validity (face validity, content validity, criterion-related validity and construct validity) and reliability (test-retest reliability), and could be applied to the related multicultural lifestyle change surveys in full immigrant population and more wide use after being revised appropriately.

## Competing Interests

The authors declare that they have no conflict of interests.

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