Impact of the Intervention

INTERNATIONAL NURSING RESEARCH IN GUANGZHOU, CHINA
International Nursing Research in Guangzhou, China

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• First Affiliated Hospital of Jinan University
Funding for the Study and Support for Presentation of the Findings

- University of Wisconsin-Eau Claire Foundation
- University of Wisconsin-Eau Claire Center for International Education
- Office of Research and Sponsored Programs at University of Wisconsin-Eau Claire
- College of Nursing at University of Wisconsin-Eau Claire
- Department of Nursing at University of Wisconsin-Eau Claire
- University of Wisconsin-Eau Claire Academic Affairs Professional Development Program
- Sigma Theta Tau, Delta Phi Chapter,
- University of Wisconsin-Eau Claire
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BACKGROUND AND AIMS
Pre-Visit Preparation

- **2007:** Kirkhorn, LE: Summer Teaching Fellowship to Guangzhou China
- **Four (4) years of online dialogue (2007-2011) between Chinese hospital nurse diabetes educator, Peiru Zhou, and American co-investigator Kirkhorn helped lay the foundation and pave the way for our 2011 International Summer Fellowship and Nursing Research Project in China.
Background and Specific Aims:

- Two University of Wisconsin-Eau Claire (UW-EC) nursing faculty, two UW-EC undergraduate nursing students, and one UW-EC undergraduate economics student visited China in summer 2011.
- Working collaboratively with Chinese nurses at the First Affiliated Hospital of Jinan University and with the assistance of Chinese language translators from Guangzhou,
- Our international research project (an after-school exercise intervention) emphasized primary prevention of type 2 diabetes mellitus among middle school aged youth.
Letters of Invitation for the 2011 Study

March 28, 2011
Professor Lee-ellen C. Kitchell, PhD, RN
Department of Nursing
College of Nursing and Health Sciences
305 Garfield Avenue
Madison, Wisconsin 53701

Dear Professor Kitchell,
This is a letter of welcome to Jinan University and the First Affiliated Hospital of Jinan University. We are happy to welcome you to our campus community and to the city of Guangzhou, China from May 20th to May 28th, 2011.
We are happy to be working with you on a nursing education project, and we extend a welcome invitation to you.

Sincerely yours,
Vicky Chen
Director of Nursing
The First Affiliated Hospital of Jinan University
613 West Huangpu Ave.
Guangzhou, 510632
P.R. of China

March 28, 2011
Catherine M. Berry, MSN, RN
Department of Nursing
College of Nursing and Health Sciences
105 Garfield Avenue
Eau Claire, Wisconsin 54702

Dear Ms. Berry,
This is a letter of welcome to Jinan University and the First Affiliated Hospital of Jinan University.
We are happy to welcome you to our campus community and to the city of Guangzhou, China from May 20th to June 1st, 2011.
We are happy to be working with you on a nursing education project, and we extend a welcome invitation to you.

Sincerely yours,
Weiwei Chen, RN
Director of Nursing
The First Affiliated Hospital of Jinan University
613 West Huangpu Ave.
Guangzhou, 510632
P.R. of China
International Research Team in China
Need for the Research

• China was once considered to have one of the leanest populations, but it is fast catching up with the West in terms of the prevalence of overweight and obesity; disturbingly, this transition has occurred in a remarkably short time.

• Mirroring dietary patterns of American youth, Chinese are consuming more fast food and smaller amounts of fresh fruit and vegetables.
Poor diets harming youth

By ZHOU WENTING
CHINA DAILY

BEIJING — Wang Zhen, a 14-year-old middle school student in Shanghai, rarely has breakfast. And even when he does eat it, his meal typically consists of a piece of bread and two eggs — which are considered a great meal by students' standards.

But the boy, who weighs more than 40 kilograms, needs a lot of energy to keep up with his studies. He says his parents don’t have time to prepare his breakfast.

The young boy already has hypertension, and doctors say he is at risk of developing obesity if his eating habits do not change.

More and more children and teenagers are at risk of developing chronic diseases because of their unhealthy eating habits.

The report, released by the Chinese Association for Student Nutrition and Health Promotion, was based on survey data from the Chinese Center for Disease Control and Prevention collected in four cities — Shanghai, Harbin, Jinan and Guangzhou — in 1998 and 2006.

The report contends that unhealthy habits have made chronic diseases more common among the young.

According to the report, a nutritious breakfast should include five kinds of foods: grains, milk, eggs, vegetables and fruits. The findings concluded that the proportion of students who eat a nutritious breakfast had dropped from 12.2 percent in 1998 to 6.3 percent in 2006.

Meanwhile, the proportion of students who eat an unbalanced breakfast, consisting of the most of two of the five types of food, had risen from nearly 50 percent to nearly 80 percent between the same two years.

The study also found that more than 35 percent of children and teenagers are overweight and 20 percent of them have been diagnosed with obesity.

Experts acknowledge that the pace of life in China has accelerated and greatly during the past 10 years. They say parents should resist the pressures that lead many to neglect eating three square meals a day and should insist on a habit of eating breakfast into their children’s habits.

Perhaps the best way they can do is to make sure they themselves sit down to eat breakfast. After all, breakfast is really important to the healthy growth of children.

“Parents pay great attention to their children’s schooling but little to their diets, which can influence their whole body”, said Su Zhihong, nutrition and food safety professor with China Agricultural University.

“Experts acknowledge that the pace of life in China has accelerated and greatly during the past 10 years. They say parents should resist the pressures that lead many to neglect eating three square meals a day and should insist on a habit of eating breakfast into their children’s habits.”
New generation of eating?
Statement of the Question:

- After school exercise programs have a track record of considerable success with American youth and obesity reduction (Bindler, et al, 2007-2012).

- What is the efficacy of a primary prevention nursing project (after school exercise program) in China modeled after successful American nursing programs to address obesity prevention in youth?
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ABOUT THE PROJECT
The project, called “Group 8” was a team effort between Chinese and American Nurses to promote healthy eating and regular physical activity among middle school aged youth in Guangzhou.

Study participants were students in grade 7 from two large, urban middle schools in China (School A and School B). School A represented a higher socioeconomic level than School B.

There were more than 100 students in School A and slightly more than 40 students in School B. More boys than girls were represented in the samples in both schools.
Group 8 Logo!

- University of Wisconsin-Eau Claire International Student Jialin Zhao (Graduate of Jinan University) and Logo Designer for Group 8
Inter-Cultural Research Considerations

• IRB Approval Process: The experience of conducting inter-cultural research with Chinese middle school students, RNs, and translators added complexity.

• IRB approval through the University of Wisconsin-Eau Claire was accomplished one (1) month in advance of the study.
Inter-Cultural Research and IRB (human Subjects) Considerations

• Approval from the First Affiliated Hospital Board was also obtained one (1) month prior to the research by the hospital Director of Nursing and facilitated by the UW-EC Center for International Research Director who helped clarify the scope of the work with hospital and nursing administrators

• Approval from each school director, principal, teachers were obtained on site one (1) week in advance of the project;

• Students were invited to participate in the after school program by their teachers the day of the study; All participation was strictly voluntary;

• Participation in the health education component of the study was a part of classroom participation;

• Completion of the self-report data was strictly voluntary
Letter of Introduction to Participating Schools

联系函

广州市天河区骏景小学：

兹有我院护理部人员陪同 Pro. Lee-Ellen 到贵校联系工作，Pro. Lee-Ellen 来自 College of Nursing and Health Sciences Eau Claire Wisconsin University，Eau Claire Wisconsin University 是暨南大学的姐妹学校，有着多年的合作交换关系。Pro. Lee-Ellen 来中国的目的是通过对肥胖青少年的体重、血压检测，并进行对肥胖儿童的营养、活动教育预防糖尿病的发生。

希望得到贵校的支持与配合！

暨南大学附属第一医院

2011-05-28
Investigators and Participants

• Investigators included the UW-EC group (students and faculty) and Chinese nurses and language translators from the First Affiliated Hospital of Jinan University- Guangzhou, China.

• Chinese Middle Schools ~ Taian and Jinan

• Middle school administrators, teachers, and students
Chinese Language Translators with American Research Team
Inter-Cultural Relationships: Middle School Administrators and Nursing Staff
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RESEARCH DESIGN AND METHODS
A quasi-experimental non-equivalent control group pre-test/post-test design was used to gather information about the impact of an after school exercise intervention upon the two groups of middle school aged youth.
Design

Basic descriptive data from the study sample and inter-correlations among the following study variables were obtained:

- school
- gender
- screen time
- self-appraisal of exercise
- healthy body
- diet
- BMI
Design

- Dissemination by design was incorporated into the study with updated information, photos, and other details about the project presented on a web log for the duration of the study: http://www.lekirkhorn.blogspot.com
Instrumentation

- The bi-lingual data collection form (Mandarin Chinese/English) consisted of the following elements of self-reported data:
  - perception of overall health
  - electronic screen time (in minutes per day)
  - structured physical activity (in minutes per day)
  - frequency of fast food consumption (daily, weekly, monthly)
  - perceived quality of diet
  - family history of type 2 diabetes
  - and BMI before and after the intervention.
Properties of the Instrument

- Chinese Middle School students were surveyed before and following the program using this bi-lingual data sheet co-created by the UW-EC nursing faculty and Chinese Nurses at the First Affiliated Hospital of Jinan University. The instrument was piloted for content and readability on a 6th grade middle school student from Jinan prior to administration.
Health Education Program (健康教育项目)  
Affiliated Middle School and College of Nursing and Health Sciences  
University of Wisconsin- Eau Claire  
The First Affiliated Hospital

Data Collection Record (Day 1) and at the End of the Intervention  
第一天及最后一天数据收集问卷

Id. Number(问卷编号):

School Name 姓名:  
English Name (英文名):  
Grade Level of Student 年级:

Student's Age (年龄):  
Student's Gender (性别):  
E-mail Address (邮箱):

Student's Height and Weight (身高、体重):

1. How do you feel about the quality of your diet? (Circle one) 你如何看待自己日常饮食的质量？（只选一项）;
   a) very good (非常好)  b) ok(还可以)  c) very bad (很糟糕)

2. How often do you eat American fast food (e.g. McDonalds, KFC, Pizza Hut)? 你通常多长时间吃美国食品（如麦当劳、肯德基、必胜客）
   a) never (从不吃)  b) occasionally (1/month) 偶尔吃（每月一次）
   c) often (1/week) 经常吃（每周一次）  d) all the time (every day) 经常吃（每天）

3. How much structured physical activity do you get every day? 
你每天花多少时间做运动？

______________ Minutes (分钟)

4. How much time do you spend at the computer every day? 你每天花多少时间在电脑上？

______________ Minutes (分钟)

5. How do you feel about your body? 你对自己的身体状况感觉如何？
   a) very healthy (非常健康)  b) ok(还可以)  c) very bad (很糟糕)
Sample Characteristics

- **Sample Statistics:**
- **Total Sample Size:** $N = 178$ students
  - 101 male,
  - 76 female,
  - 1 did not disclose

- **Location of the study:**
  Guangzhou, China (Red Dot)
School A
Key:
n = 133 students
Gender of Students:
78 male [light blue],
54 female [bright yellow],
1 did not disclose
Demographic Data School A, Continued:

- Average height (male): 165.8cm pretest, 166.0cm post-test
- Average height (female): 158.8cm pretest, 159.3cm post-test
- Average weight (male): 55.7kg pretest, 55.6kg post-test
- Average weight (female): 50.0kg pretest, 48.6kg post-test
- *Height and Weight are self-reported estimates.*
Demographic Data School B

- Middle School B: n = 45 students (23 male, 22 female)
- Average height (male): 165.7cm pretest, 166.3cm post-test
- Average height (female): 159.4cm pretest, 158.8cm post-test
- Average weight (male): 52.1kg pretest, 52.7kg post-test
- Average weight (female): 49.4kg pretest, 48.4kg post-test

*Height and Weight
are self-reported estimates.
Variables* associated with type 2 DM

- Diet high in processed food, fat, sugar, salt
- Moderate-high fast food consumption
- High electronic screen time
- Low physical activity
- Family history of type 2 DM
- BMI above normal range for geographic region
- Pre existing health conditions affecting glucose metabolism or weight management

*Examined in present study
*Reported in current literature as co-morbid with overweight and obesity
Operational Definitions for Self-Reported Variables:

• Diet: Quality rated as Good (3), Fair (2), Poor (1)
• Fast food consumption: Frequency of eating American Fast Food, such as McDonalds, Pizza Hut, rated as monthly (4), weekly (3), or daily (2), or never (1)
• Electronic screen time: minutes/day
• Physical activity: minutes/day
• Family history of DM: Yes, No
• BMI above normal range for geographic region: Calculated based upon self reports of height/weight
• Self Perceived Health of Body rated as Bad (1), Okay (2), Very Healthy (3)
Socioeconomic Comparison between Students of Schools A and B

- School A: Situated on the campus of Jinan University, parents are typically university educated and reside on campus in gracious living conditions. Most homes have western plumbing and modern conveniences such as air conditioning and family access to campus gym and swimming pool.

- School B: Unknown educational background of family members. Families reside in generally crowded living conditions and may or may not have western plumbing or air conditioning. Access to gym and campus swimming pool is unlikely.
Methodology

• More than 100 students from two economically and socially diverse middle schools in China were enrolled in a program created by the American team and delivered to students with the assistance of Chinese Language Translators.

• The health promotion program included structured information about balanced diet and regular physical activity.
Health Education Delivered via Chinese Language Translators: Each American Team Member Personalized with their own Family Photo

Screen Time and Exercise
- Screen time includes video games, computer time, TV watching
- Recommended 1 hour or less screen time per day outside of school and homework
- Exercise at least 30 minutes per day according to your ability

Overweight and Obesity
- The World Health Organization (WHO) reports worldwide obesity has more than doubled since 1980.
- Overweight and obesity are defined as "abnormal or excessive fat accumulation that may impair health."
- Body Mass Index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults.
- BMI ≥ 24 is overweight (Chinese reference)
- BMI ≥ 28 is obesity (Chinese reference)

Diabetes Mellitus Type 2
- Diabetes is a chronic disease
- Occurs when the pancreas does not produce enough insulin
- Or the body cannot effectively use the insulin it produces.
- Insulin is a hormone that regulates blood sugar
- Hyperglycemia (raised blood sugar)
  - Common effect of uncontrolled diabetes
  - Over time leads to serious damage
  - Especially nerves and blood vessels

Diabetes Mellitus Type 2
- Results from ineffective use of insulin
- Comprises 90% of people with diabetes globally
- Largely the result of excessive body weight and physical inactivity.

Sensible Eating
- Cautions:
  - Fast food (McDonald’s, Kentucky Fried Chicken)
  - Fried Foods
  - Buffets
- Moderation and Portion Control
- Balance Intake with Exercise
Methodology

• One group of students received an after school exercise component to the intervention (School A)
• One group of students (School B) served as the control, and received education only

• The program called “Group 8” and a logo, [representing a running shoe and containing the name], was designed by a UW-EC Chinese International Student and imprinted on T-Shirts (UW-EC School Colors) and water bottles.
Intervention

- School A:
- School A was chosen for the after school exercise intervention based upon receptivity to the foreign investigative team, strong affiliations between UW-EC and Jinan University, and willingness to allow outside groups to work with students in a structured program of after school (busy time with large examination schedules to work around) exercise.
Intervention ~ School A

- T-Shirts, H₂O Bottles, Pedometers, and PowerPoint Presentation (Educational Information) + 3 Structured Sessions of VIGOROUS AFTER SCHOOL EXERCISE

- After School Exercise Programs have shown success in the US (Bindler, et al, 2007-2012).

- The American team brought a unique American made T-Shirt to China for each study participant to strengthen in-group consciousness and to underscore the importance of exercise as a team.

- Pedometers and Water Bottles were given to participants to encourage continuation of exercise beyond the time of the intervention.
Intervention ~ School A

- Students were instructed to bring exercise clothes for the playground after school on three days in early-mid June (two consecutive Wednesdays, and the following Monday).

- All participation in the after school exercise was voluntary.

- Exercise consisted of 30 minutes of vigorous play and activity such as relay races, ‘freeze tag’ and jumping jacks.

- Chinese students were supervised by playground teachers and American Research members, to coach and encourage team participation and to observe for and prevent over-exertion or injury.

- Student heart rates were obtained before and following exercise, though this data is not included in the present study.
T-Shirt close-up with LOGO!
The Intervention for School B included the same educational presentation \textbf{without} the companion after school exercise.

Participants from School B also received t-Shirts, water bottles or pedometers as a condition of active discussion.

A link to discussion in School B available on our blog http://www.lekirkhorn.blogspot.com.
Classroom participants from School B
Nursing Research Questions

• Is there a statistically significant difference between risk factors for type 2 diabetes mellitus among students who attend middle schools of varied socioeconomic levels?

• Is there a statistically significant difference between family history of type 2 diabetes mellitus among students who attend middle schools of varied socioeconomic levels?
Nursing Research Questions

- Are there gender differences between risk factors?
- Is there a statistically significant difference between students before and after a structured program of physical activity?
- Is there a systematic difference between an “education only” intervention compared to “education combined with physical activity”?
## Analysis

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Statistical Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there a statistically significant difference between risk factors for type 2 diabetes mellitus among students who attend middle schools of varied socioeconomic levels?</td>
<td>t-test for independent means; $\alpha = .05$</td>
</tr>
<tr>
<td>Is there a statistically significant difference between family history of type 2 diabetes mellitus among students who attend middle schools of varied socioeconomic levels?</td>
<td>$\chi^2$ analysis</td>
</tr>
<tr>
<td>Are there gender differences between risk factors?</td>
<td>t-test for independent means; $\alpha = .05$</td>
</tr>
<tr>
<td>Is there a statistically significant difference between students before and after a structured program of physical activity?</td>
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<td>Is there a systematic difference between an “education only” intervention compared to “education combined with physical activity”?</td>
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</tr>
</tbody>
</table>
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FINDINGS
### COMPARISON BETWEEN PRE AND POST TEST FINDINGS FOR MIDDLE SCHOOL A

<table>
<thead>
<tr>
<th>Pre-Test to Post-Test Middle School A</th>
<th>Pre Mean (SD)</th>
<th>Post Mean (SD)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Perceived Health*</td>
<td>2.24 (0.50)</td>
<td>2.32 (0.50)</td>
<td>.049</td>
</tr>
<tr>
<td>Screen Time (min/day)***</td>
<td>61.73 (68.33)</td>
<td>43.90 (59.92)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Structured Physical Activity (min/day)</td>
<td>58.88 (43.92)</td>
<td>60.55 (43.10)</td>
<td>.636</td>
</tr>
<tr>
<td>Frequency of Fast Food Consumption*</td>
<td>2.08 (0.49)</td>
<td>1.98 (0.48)</td>
<td>.023</td>
</tr>
<tr>
<td>Perceived Quality of Diet</td>
<td>2.27 (0.49)</td>
<td>2.27 (0.45)</td>
<td>.863</td>
</tr>
</tbody>
</table>

Statistically significant difference from pre to post for Middle School A indicated by asterisks as follows:

- $\alpha = .05$
- * $p < .05$
- ** $p < .01$
- *** $p \leq .001$
COMPARISON BETWEEN PRE AND POST TEST FINDINGS FOR MIDDLE SCHOOL B

<table>
<thead>
<tr>
<th>Pre-Test to Post-Test Middle School A</th>
<th>Pre Mean (SD)</th>
<th>Post Mean (SD)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Perceived Health***</td>
<td>2.10 (0.38)</td>
<td>2.35 (0.45)</td>
<td>.001</td>
</tr>
<tr>
<td>Screen Time (min/day)***</td>
<td>121.63 (79.76)</td>
<td>67.5 (60.25)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Structured Physical Activity (min/day)***</td>
<td>42.63 (25.70)</td>
<td>87.25 (58.80)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Frequency of Fast Food Consumption**</td>
<td>2.12 (0.40)</td>
<td>1.93 (0.35)</td>
<td>.003</td>
</tr>
<tr>
<td>Perceived Quality of Diet**</td>
<td>2.17 (0.38)</td>
<td>2.14 (0.50)</td>
<td>.006</td>
</tr>
</tbody>
</table>

Statistically significant difference from pre to post for Middle School B, indicated by asterisks as follows:

\( \alpha = .05 \)

* \( p < .05 \)

** \( p < .01 \)

*** \( p \leq .001 \)
DIFFERENCE BETWEEN PRE AND POST TEST FINDINGS FOR MIDDLE SCHOOL A AND MIDDLE SCHOOL B

<table>
<thead>
<tr>
<th>Middle School</th>
<th>A Mean (SD)</th>
<th>B Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Perceived Health Pre-Test*</td>
<td>2.24 (0.50)</td>
<td>2.11 (0.39)</td>
</tr>
<tr>
<td>Self Perceived Health Post-Test</td>
<td>2.33 (0.50)</td>
<td>2.30 (0.48)</td>
</tr>
<tr>
<td>Screen Time (min/day) Pre-Test***</td>
<td>61.02 (68.05)</td>
<td>126.25 (81.18)</td>
</tr>
<tr>
<td>Screen Time (min/day) Post-Test*</td>
<td>43.90 (59.92)</td>
<td>68.05 (59.59)</td>
</tr>
<tr>
<td>Structured Physical Activity (min/day) Pre-Test*</td>
<td>59.89 (43.75)</td>
<td>45.11 (32.66)</td>
</tr>
<tr>
<td>Structured Physical Activity (min/day) Post-Test**</td>
<td>60.54 (42.94)</td>
<td>87.68 (58.13)</td>
</tr>
<tr>
<td>Frequency of Fast Food Consumption Pre-Test</td>
<td>2.07 (0.50)</td>
<td>2.16 (0.48)</td>
</tr>
<tr>
<td>Frequency of Fast Food Consumption Post-Test</td>
<td>1.98 (0.48)</td>
<td>1.93 (0.35)</td>
</tr>
<tr>
<td>Perceived Quality of Diet Pre-Test</td>
<td>2.27 (0.50)</td>
<td>2.18 (0.39)</td>
</tr>
<tr>
<td>Perceived Quality of Diet Post-Test</td>
<td>2.28 (0.45)</td>
<td>2.41 (0.50)</td>
</tr>
</tbody>
</table>

*Statistically significant difference from pre to post on selected variables

\( \alpha = .05 \)
PRE-TEST AND POST-TEST SELF-PERCEIVED HEALTH AT MIDDLE SCHOOL A AND MIDDLE SCHOOL B

1 = Very Bad
2 = OK
3 = Very Healthy
PRE-TEST AND POST-TEST
SCREEN TIME
AT MIDDLE SCHOOL A AND MIDDLE SCHOOL B
PRE-TEST AND POST-TEST STRUCTURED PHYSICAL ACTIVITY AT MIDDLE SCHOOL A AND MIDDLE SCHOOL B
PRE-TEST AND POST-TEST FREQUENCY OF FAST FOOD CONSUMPTION AT MIDDLE SCHOOL A AND MIDDLE SCHOOL B

1 = Never
2 = Occasionally (1 time/month)
3 = Often (1 time/week)
4 = Always (every day)
PRE-TEST AND POST-TEST
STUDENT’S PERCEIVED QUALITY OF DIET
AT MIDDLE SCHOOL A AND MIDDLE SCHOOL B

1 = Very Bad
2 = OK
3 = Very Good
Pretest Mean (SD) Boys = 68.27(51.04); Girls = 45.38(24.69), t(118.50) = 3.41, p = .001. This is a statistically significant gender difference.

Post-Test Mean (SD) Boys = 67.35(51.66); Girls = 50.09(22.63), t(111.60) = 2.59, p = .011. This is a statistically significant gender difference.
PRE-TEST AND POST-TEST BOYS AND GIRLS SELF REPORTED STRUCTURED PHYSICAL ACTIVITY AT MIDDLE SCHOOL B

Pretest Mean (SD) Boys = 54.55(39.699); Girls = 35.68(20.546), t(42) = 1.979, p=.054. This is not a statistically significant gender difference.

Post-Test Mean (SD) Boys = 96.59(45.862); Girls = 77.37(69.609), t(39) = 1.057, p = .297. This is not a statistically significant gender difference.
Pretest Mean (SD) Boys = 71.73(81.229); Girls = 43.87(36.316), t (114.317) = 2.663, p=.009. This is a significant gender difference

Post-Test Mean (SD) Boys = 52.75(73.991); Girls = 31.06(25.134), t (99.846) = 2.378, p = .019. This is a significant gender difference
Pretest Mean (SD) Boys = 2.34(.503); Girls = 2.17(.466), t (119.416) = 2.001, p=.048. This is a statistically significant gender difference.

Post-Test Mean (SD) Boys = 2.34(.476); Girls = 2.20(.407), t (123.984) = 1.729, p = .086. This is not a statistically significant gender difference.
Pretest Mean (SD) Boys = 2.34(.503); Girls = 2.17(.466), t (119.416) = 2.001, p=.048. This is a statistically significant gender difference.

Post-Test Mean (SD) Boys = 2.34(.476); Girls = 2.20(.407), t (123.984) = 1.729, p = .086. This is not a statistically significant gender difference.
PRE-TEST AND POST-TEST BOYS AND GIRLS PERCEPTION OF QUALITY OF DIET AT MIDDLE SCHOOL  

1= Very Bad  
2= OK  
3= Very Good  

Pretest Mean (SD) Boys = 2.22 (.422); Girls = 2.14 (.351), t (43) = .699, p=.489.  
This is not a statistically significant gender difference  

Post-Test Mean (SD) Boys = 2.55 (.510); Girls = 2.26 (.452), t (38.962) = 1.879, p = .068.  
This is not a statistically significant gender difference
**PRE-TEST AND POST-TEST BOYS AND GIRLS FREQUENCY OF FAST FOOD CONSUMPTION AT MIDDLE SCHOOL**

<table>
<thead>
<tr>
<th>Frequency Level</th>
<th>Description</th>
<th>Pre-Test Mean (SD)</th>
<th>Post-Test Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Never</td>
<td>Boys = 2.16 (.515)</td>
<td>Girls = 1.94 (.452)</td>
</tr>
<tr>
<td>2</td>
<td>Occasionally (1 time/month)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Often (1 time/week)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Always (every day)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pretest Mean (SD) Boys = 2.16 (.515); Girls = 1.94 (.452), t (122.530) = .2.487, p=.014
This is a statistically significant gender difference

Post-Test Mean (SD) Boys = 2.06 (.522); Girls = 1.87 (.391), t (129) = 2.321, p = .022.
This is a statistically significant gender difference
PRE-TEST AND POST-TEST BOYS AND GIRLS FREQUENCY OF FAST FOOD CONSUMPTION AT MIDDLE SCHOOL

1= Never
2= Occasionally (1 time/month)
3= Often (1 time/week)
4 = Always (every day)

Pretest Mean (SD) Boys = 2.13 (.548); Girls = 2.18 (.395), t (43) = -.359, p=.721.
This is not a statistically significant gender difference

Post-Test Mean (SD) Boys = 1.91 (.294); Girls = 1.95 (.405), t (39) = -.350, p = .728.
This is not a statistically significant gender difference
DIFFERENCE BETWEEN PRE-TEST AND POST-TEST BMI
AT MIDDLE SCHOOL A AND MIDDLE SCHOOL B

Pretest Mean (SD) A = 20.06 (3.63); B = 18.95 (3.66), t (156) = 1.60, p = .11.
This is not a statistically significant difference between schools

Post-Test Mean (SD) A = 19.72 (3.02); B = 19.03 (3.72), t (152) = 1.12, p = .26.
This is not a statistically significant difference between schools
DIFFERENCE IN SELF REPORTED FAMILY HISTORY OF TYPE 2 DIABETES BETWEEN MIDDLE SCHOOL A AND MIDDLE SCHOOL B

At middle school A, 23% reported a family history. At middle school B, 42% reported a family history. This is a significant difference and a weak effect, $\chi^2 (1, N=172) = 5.42, p= .02$, Cramer’s V= .18.
Impact of the Intervention

CLINICAL IMPLICATIONS
Clinical Implications

- Group 8 heightened awareness of the importance of regular physical activity and healthy eating practices among middle school aged youth.

- Group 8 demonstrated primary prevention and offers a model for nursing practice in schools and communities in China.
Clinical Implications

• Our after school exercise intervention was more effective than education alone for certain variables of self-perceived health and electronic screen time; interestingly, students in the lower socioeconomic school reported greater physical activity than the students attending School A,

• Even with the benefit of our after school exercise program, greater amounts of walking and bike riding among students in School B may have accounted for this statistically significant difference in self-reported physical activity.
Clinical Implications

- Overall, Group 8 was successful in raising students’ perception of their own health, in lowering perceived frequency of fast food intake, reducing electronic screen time, and enhancing physical activity.

- Lower Socioeconomic Status may be somewhat protective for risk factors of type 2 DM; or the smaller sample size in school B may have interfered with risk detection; or perhaps risk is not yet detectable due to the age of subjects.
Clinical Implications

• American Fast Food in China is considered a luxury, expensive, and not as prevalent in lower socioeconomic groups as it is in higher income brackets.

• Chinese “Fast Food” ~ “Fried and Salty food on a stick” is equally prevalent among lower and upper income groups and available through local street food vendors.
LIMITATIONS OF THE STUDY

Impact of the Intervention
Limitations

• Overall, the study design as executed in China posed measurement threats to the independent variable because of absence of control, i.e. non-equivalent educational and exercise sessions (due to multiple translators and different American team members in separate classrooms), non-equivalent samples in the experimental and control groups, absence of random assignment to the experimental and control groups, and absence of matching, particularly on dependent variables of diet and exercise.
Limitations, Continued

- Uneven number of boys and girls in the [otherwise homogeneous] study sample
- Uneven numbers of students at the two schools [4 classrooms at School A, 1 classroom at School B]
- Sub-optimal exercise conditions for the independent variable: Intensely hot, end of school term with students studying for comprehensive exams
Limitations, Continued

- Objective data collection of height, weight, blood glucose or any physiological parameters other than heart rate was not permitted, so data collection was limited to self-reported information.

- Limited generalizability of the data, due to a smaller sample in School B.
Limitations, Continued

• Limited Psychometric Properties for the Data Collection Instrument with some weak items, such as self-perceived health, which could be variously interpreted as personal appearance, body image, or health status.

• Data Collected on variables of diet and exercise were limited, e.g. minimal data about specifics of daily dietary intake and amount of physical activity.
Limitations, Continued

• Finally, we acknowledge limited time and financial resources for the investigative team to conduct a longer, larger, more statistically robust prospective study.
Impact of the Intervention

UNDERGRADUATE NURSING STUDENT PERSPECTIVES
Endnotes from Anja:

International Research: Undergraduate Nursing Perspectives
Impact of the Intervention

DIRECTIONS FOR FUTURE STUDY
Opportunities for Future Research

• Continued focus upon Primary Prevention of Obesity in China with a larger, more robust study design

• Examine the impact of feeding and eating information for Chinese parents of young children

• Study 24-hour dietary recall and intake analysis among Chinese students

• Develop an international standard to include Chinese images of appropriate meals (including edible plants, insects, rice, noodles, and other protein sources) that are part of the Chinese diet for dietary analysis and teaching,
Opportunities for Future Research, Continued

- Design exercise prescriptions tailored for Chinese students
- Conduct a Secondary Prevention Program tailored for obese Chinese youth at risk for type 2 DM
- Work with a larger interdisciplinary team of Nursing, Kinesiology, Physical Therapy, Economics, Pharmacology, and Pre-Med Students to design a more robust study of the impact of exercise upon high risk Chinese middle school students
- Conduct a Longitudinal Follow-up Study of Exercise and Eating Habits among Chinese Middle School Students
Opportunities for Future Research, Continued

• Involve International Students who visit American High Schools and Universities in a study of obesity prevention through exercise and sensible eating.
Clinical Research Sidebar: Public Health
Obesity Interventions in Rural Wisconsin
Rural Wisconsin Clinical Highlights

• NAP SACC = Nutrition and Physical Activity for Child Care [in Rusk County, Wisconsin]

• An intervention in child care centers aimed at improving nutrition and physical activity environment, policies and practices through self-assessment and targeted technical assistance
Rusk County, Wisconsin Community Partnership for Obesity Prevention

- Rural Wisconsin Project Partners:
- Child care facility directors, key center staff, NAP SACC Consultant, Security Health, Director Kayo Nash, RN and Rusk County Public Health Department, Nurses who implemented NAP SACC within the community, Accelerated BSN Nursing Students at University of Wisconsin, Eau Claire, and Lee-Ellen C. Kirkhorn, PhD, RN, Faculty Mentor.
Impact of the Intervention

CONCLUDING COMMENTS
Concluding Comments

• The iniquitousness of American Fast Food Chains and the subsequent increase in obesity among persons around the world is a travesty of epic proportion.

• We offer our project as a beginning step, and share work that merits further research as well as offering projects ideas designed to prevent obesity in young people from our home state of Wisconsin.
Concluding Comments

• Although examples of secondary levels of prevention (for type 2 diabetes) are visible in Guangzhou and the role of the diabetes nurse educator is becoming increasingly important in China, clinical primary prevention nursing practice in schools and community settings is less commonplace.

• To the best of our knowledge, Group 8 represents the first American-Chinese Nursing team effort to tackle the obesity problem in Guangzhou with a targeted primary prevention of obesity education and exercise program for middle school students.
Concluding Comments

• We offer our American-Chinese Nursing Project, Group 8, as a team effort to bring an Evidence-Based Clinical Project to help prevent Obesity and minimize preventable risk for type 2 DM in China.
Impact of the Intervention

REFERENCES
Published Descriptions of Our Chinese Intercultural Immersion:


• Blog address: http://www.lekirkhorn.blogspot.com
References


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- Bindler RC, Richardson B, Daratha K, Wordell D; For the TEAMS Project (Teen Eating and Activity Mentoring in Schools).
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Impact of the Intervention

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PowerPoint Presentation credit: www.presentationmagazine.com