NUTRITIONAL STATUS AND WORM INFESTATION OF ADOLESCENT BUDDHIST NUNS IN YANGON REGION

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INTRODUCTION
- Adolescence - ages between 10-19 years
- Adolescents - 1.2 billions (16.4%) of the global population (2014)
- About 19.36% of Myanmar population and 49.7% is girl
- Good nutrition during adolescence - critical
Nutritional status of children with institutional life style was not so bad in the study Children Living in Fostered Monasteries in Yangon Region

- Stunting 19%,
- Underweight in 5-9 yrs old 10-14 yrs old were 1.9% and 6%
- Overweight prevalence were 1.9% and 4.5% respectively
- Anemia among fostered children was high, 52.5%
More than 1.6 billion people worldwide are anemic and the prevalence is highest in SEA.

MDHS (2015-2016) ---- 47% of women age 15-49 are anemic.

Women in urban are as likely to be anemic as in the rural.

Anemia levels vary by state/region.

In Yangon, 53.6% of women are anemic.
Adolescent girls and women of reproductive age - high risk groups for developing anemia

About 50% cases of anemia - caused by iron deficiency

Infectious diseases - malaria, tuberculosis and HIV/AIDS can also contribute to anemia
Preschool and school-aged children tend to harbour the greatest numbers of intestinal worms and causing

- Growth stunting,
- Diminished physical fitness
- Impair childhood educational performance,
- Reduce school attendance
- Reduce future wage-earning capacity
- Associated with under nutrition and reduced physical fitness.
Justification

- Monastic education are a nation-wide network of schools
- Attracting students from poor, ethnic, migrant communities.
- Little government support
- Yangon Region, 2017-2018: 1049 nunneries with about 19,822 nuns
- Their living condition and personal hygiene may be poor
- Health care and nutritional support may be neglected
GOAL 2

END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVED NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE

SUSTAINABLE DEVELOPMENT GOALS
More at sustainabledevelopment.un.org/sdgsproposal
AIM AND OBJECTIVES
Aim

To determine the nutritional status and intestinal worm infestation of adolescent Buddhist nuns in Yangon Region
Objectives

1. To assess nutritional status of adolescent Buddhist nuns by measuring anthropometry (height and weight) and hemoglobin concentration.

2. To describe the dietary pattern of nuns by food frequency questionnaires.

3. To find out the presence of worm infestation in adolescent Buddhist nuns by stool examination.

4. To determine the relationship between worm infestation and nutritional status of adolescent Buddhist nuns.
MATERIALS AND METHODS
Study design
- Cross sectional descriptive

Place of Study
- Six Selected Buddhist nunnery in Yangon Region

Study period
- February to November

Reference Population
- Adolescent Buddhist nuns in Yangon Region

Study population
- Adolescent Buddhist nuns in selected nunneries in Yangon region
Sample size calculation

Sample size was determined by using formula,

\[ n = z^2_{(1-\alpha/2)} \cdot p \cdot q / d^2 \]

\( p = \) Prevalence of anemia (59.1\%) in adolescence school girl in Nyaung Done Township by Min-Kyaw-Htet et al., 2012

With non-respondent rate 10\%

Minimum sample size of 340 will be needed for the study.
Sampling procedure

- List of Buddhist nunneries situated in Yangon Region
- Buddhist nunneries with at least total 150 nuns were listed
- 6 were randomly selected.
- About 57 of adolescent nuns were chosen from each 6 nunneries
- Data collection - within one day in each nunnery with 6 members
Portable height measurement board

Digital Bathroom scale
(seca clara 803)
Battery-operated portable HaemoCue 301 analyzer
STOOL EXAMINATION
Data Analysis

- SPSS version 16.
- Chi-square after construction cross tables.
- Odds ratio - the association between nutritional status and different study variables.
- Multiple logistic regression analysis
- Two tailed p-value <0.05 - statistically significant.
Ethical Consideration

- Guidelines by the Research and Ethics Committee of University of Medicine 1, Yangon.
- Approval from authority of Yangon Region Religious Affairs & Yangon Region Public Health Department
- Taking informed consents
- The nuns with anaemia and severe wasting were referred
Limitation of the study

- Cross-sectional nature - did not reveal causal links
- The diet pattern in the religious institution life - limited
- Only present or absent of anaemia could be done in this study
- Stool examinations - only done by saline wet mouth technique which was less sensitive than other tests
RESULT
Socio demographic characteristics

**Age group of nuns**

- 10-14 years: [VALUE]
- 15-19 years: [VALUE]

**Ethnic Group**

- Pao: 64.70%
- Bamar: 15.00%
- Shan: 7.60%
- Kayin: 5%
- Chin: 4.70%
- Rakhine: 1.80%
- Kayah: 0.60%
- Mon: 0.60%
Result of stool examination among adolescent Buddhist Nuns

Worm infestations - 45(14.1%) of adolescent nuns.
Table (3) Relationship between worm infestation and Nutritional status (n=319)

<table>
<thead>
<tr>
<th>Worm infestation</th>
<th>Stunting</th>
<th>Wasting</th>
<th>Anaemia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stunting No(%)</td>
<td>Normal No(%)</td>
<td>wasting No.(%)</td>
</tr>
<tr>
<td>Present</td>
<td>12(15)</td>
<td>33(13.8)</td>
<td>0(0)</td>
</tr>
<tr>
<td>Absent</td>
<td>68(85)</td>
<td>206(86.2)</td>
<td>9(100)</td>
</tr>
<tr>
<td>Total</td>
<td>80(100)</td>
<td>239(74.9)</td>
<td>9(100)</td>
</tr>
<tr>
<td>$X^2(d_f)$</td>
<td>0.07(1)</td>
<td></td>
<td>1.52(1)</td>
</tr>
<tr>
<td>$p$ value</td>
<td>0.85</td>
<td></td>
<td>0.37</td>
</tr>
</tbody>
</table>
Table (4) Univariate and multivariate analysis of determinants of anaemia in adolescent Buddhist Nuns

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unadjusted analysis</th>
<th>Adjusted analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
</tr>
<tr>
<td>Worm infestation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>1.6</td>
<td>0.85,3.04</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 14year</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>&gt;14years</td>
<td>1.2</td>
<td>0.75,1.86</td>
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<tr>
<td>Education level</td>
<td></td>
<td></td>
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<tr>
<td>Primary or below</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Above primary</td>
<td>0.8</td>
<td>0.49,1.28</td>
</tr>
<tr>
<td>Menerche</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.2</td>
<td>1.33,3.52</td>
</tr>
<tr>
<td>Variables</td>
<td>Unadjusted analysis</td>
<td>.adjusted analysis</td>
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<tr>
<td>-----------------------------------</td>
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<td>-------------------</td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
</tr>
<tr>
<td>Stay in nunnery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤3 years</td>
<td>1.0</td>
<td>0.76,2.32</td>
</tr>
<tr>
<td>3-5 years</td>
<td>1.3</td>
<td>0.76,2.32</td>
</tr>
<tr>
<td>&gt;5 years</td>
<td>2.1</td>
<td>1.18,3.74</td>
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<tr>
<td>Taking iron tablets</td>
<td></td>
<td></td>
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<tr>
<td>Yes</td>
<td>1.0</td>
<td>0.76,2.32</td>
</tr>
<tr>
<td>No</td>
<td>1.6</td>
<td>1.01,2.4</td>
</tr>
<tr>
<td>Pickle tea consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>1.0</td>
<td>0.76,2.32</td>
</tr>
<tr>
<td>0-3 times/week</td>
<td>0.8</td>
<td>0.53,1.31</td>
</tr>
<tr>
<td>4-6 times /week</td>
<td>1.6</td>
<td>0.60,4.49</td>
</tr>
<tr>
<td>&gt;7 times/week</td>
<td>1.1</td>
<td>0.41,2.65</td>
</tr>
</tbody>
</table>
According to food consumption patterns of nuns within one week,

- 41.2% of nuns did not eat red meat (beef, mutton and pork),
- 48.8% of nuns did not drink milk last week and
- 28.5% did not eat eggs.
- 81.2% ate fish/chicken/prawn 1-3 times last week,
- 84.4% ate vegetables daily and
- 59.4% drank soft drink 1-3 times a week,
- 44.4% ate pickled tea with meal 1-3 times a week.
DISCUSSION
● Nuns are living in institution life and religious persons.

● Their dietary pattern - peculiar and head out two days a week,

● Used to prepare their daily meal and eat in groups.

● Sometimes, wealthier patrons offer donation of meal.

● Most of them used to eat rice and curry both for breakfast and lunch.

● Knowledge about healthy diet and proper cooking are also important for guardians and donors of nunneries.
The proportion of adolescent nuns with anaemia, stunting and wasting - lower than data from Nyaung-Done township.

Similar finding was found in Mya-Ohnmar et al., 2013,

Proportion of anaemia - similar result as 47% of women age 15-49 years are anaemic in MDHS survey
Intestinal worm infestation - lower than the study in Shw-Gyn Township, 2017, 23.9%

Higher than the prevalence of helminth infestation in Magway Division in 2010, 3.2%.

In Myanmar, *A. lumbricoides* was the most prevalent intestinal helminth, while in Thailand and Laos, hookworm was the most prevalent.

Due to inappropriate wearing of slippers in their compounds, higher proportion of hookworm infestation.
Adolescents should be considered separately as two groups for programmatic purpose:

- Younger ones - 80% of the growth takes place & need for nutrients is very high;
- Older ones - rate of growth has slowed down but for whom micronutrient deficiency control, especially IDA control

Health providers - aware that adolescents are at risk of health problems prevalent among adults.
CONCLUSION
&
RECOMMENDATION
Good nutrition enhances the quality of life and to prevent disease.

Adolescents in nun population in institution life had the same problem.

National program of nutrition promotion also cover this population to a certain limit.

Helping the adolescent nuns in institution life also support the health of the remote area.
1. The comprehensive health program

2. Clear-cut policy and strategies for reaching adolescents in different settings.

3. Capacity building of guardians (Thi-la-shin-Sayar-Gyi), teachers in the nunnerie

4. Nutritional education of school curriculum should be updated

5. Health care providers aware regular health care for institution.
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REFERENCES


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