Promoting Safe Sunlight Exposure among School Students in Saudi Arabia: A National Comparative Study

Najla Alhraiwil; MPH, BSc
Head of Evaluation & Impact measurement unit
Deputyship of Public Health
Ministry of Health
Saudi Arabia

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Skin exposure to solar ultraviolet β radiation is the major source of vitamin D in our bodies.

Vitamin D deficiency is associated with a range of bone diseases such as rickets, osteopenia, osteoporosis, and osteomalacia.
Vitamin D deficiency (VDD) is now recognized as a pandemic!

“The American Academy of Family Physicians (AAFP) advises talking to children and young adults (10 to 24 years of age) about Safe Sunlight Exposure (SSE)”
“Strengthen Your Bones”

- It is a national educational campaign targeting governmental school students from all Saudi regions
- The campaign was launched on February 28, 2018 and lasted for five weeks
- It covered 639 schools, which represented 2.6% of all governmental schools distributed throughout Saudi Arabia
- Boys and girls. Primary, Intermediate and Highs schools
The campaign was designed to improve students’ knowledge about SSE and positively modify their attitudes and practices.

The campaign included four main messages:

1) Importance of sunlight exposure for bone health (what?)
2) Safe exposure techniques (How?)
3) Appropriate time of day for exposure during the summer and winter (When?)
4) Optimal SSE duration (How long?)
AIM OF THE STUDY

This study aimed to examine the effects of the educational campaign on promoting Saudi students' knowledge, attitudes and practices related to safe sunlight exposure (SSE).

Significance of this study:
To the best of our knowledge, this is the first national study from Saudi Arabia to evaluate the effect of a health education campaign in improving knowledge, intentions and practice regarding SSE among school students.
METHODOLOGY

- **Study design:** A National Comparative study of two groups (one was exposed to the SSE educational campaign and another that didn’t, serving as the control)

- **Target population:** Boys and girls students, from (Primary, intermediate and Secondary), aged 6-19 years old.

- **Study Setting:** Governmental schools from all 20 regions
Sample size: sample was estimated to include 1250 students in each study group. This number was increased to 1500 students in each study group “to make allowance for invalid or incomplete data”

3000 students

1500 students exposed (intervention group)

1500 students not exposed (Control group)

120 schools
**Sampling technique:** participants were selected by a multi-stage stratified random sampling.

1st stage: Encompassing the 20 regions in Saudi Arabia

2nd stage: dividing schools according to the three educational levels: primary, intermediate, and secondary.

3rd stage: categorizing each educational level into boys’ and girls’ schools.

4th stage: a simple random sample class from each school (25 students each).
MEASUREMENT TOOL & ETHICAL CONSIDERATION

• A questionnaire composed of six main domains:
  1. Socio demographic variables
  2. Knowledge
  3. Attitudes
  4. SEE practices
  5. Intentions to increase SSE in the future
  6. Opinions about the educational campaign

• Reviewed for content validity, accuracy, and clarity

• Study was approved by the IRB at King Fahad Medical City, Riyadh, Saudi Arabia

• Informed Consents were obtained
RESULTS
## Demographic Data of the Study Groups

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Intervention Group</th>
<th>Control Group</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1611</td>
<td>1421</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>749 (46.5)</td>
<td>712 (50.1)</td>
<td>0.051</td>
</tr>
<tr>
<td>Female</td>
<td>862 (53.5)</td>
<td>709 (49.9)</td>
<td></td>
</tr>
<tr>
<td><strong>School level</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>562 (34.9)</td>
<td>498 (35.0)</td>
<td>0.986</td>
</tr>
<tr>
<td>Intermediate</td>
<td>490 (30.4)</td>
<td>434 (30.5)</td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>559 (34.7)</td>
<td>489 (34.4)</td>
<td></td>
</tr>
<tr>
<td><strong>Age (year)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>14.2(2.6)</td>
<td>14.2(2.6)</td>
<td>0.841</td>
</tr>
<tr>
<td>Range</td>
<td>6:19</td>
<td>6:19</td>
<td></td>
</tr>
</tbody>
</table>
Knowledge about SSE among the Study Groups

**Percent of Right answers**

<table>
<thead>
<tr>
<th></th>
<th>Intervention Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time for exposure during summer</td>
<td>$P &lt; 0.01$</td>
<td></td>
</tr>
<tr>
<td>Time for exposure during winter</td>
<td>$P &lt; 0.01$</td>
<td></td>
</tr>
<tr>
<td>Optimal duration for exposure</td>
<td>$P &lt; 0.01$</td>
<td></td>
</tr>
<tr>
<td>Optimal method for exposure</td>
<td>$P &lt; 0.01$</td>
<td></td>
</tr>
</tbody>
</table>
Attitudes towards SSE among the Study Groups

Do you think you get a sufficient healthy amount of sun exposure?
Do you think that there is a relationship between sun exposure and bone health?
Do you intend to increase your sun exposure in the future?

Intervention Group
Control Group

Percent of positive answers

P < 0.01
P < 0.01
P < 0.01
Practice of SSE among the Study Groups

Percent Frequency of exposure to sunlight at least for 10 minutes

- Almost daily (Always)
- 3-4 times a week (Often)
- Once or twice a week (Sometimes)
- Never

P = 0.814
Gender Differences in Knowledge about SSE among the Intervention Group

Percent of write answers

0 10 20 30 40 50 60 70 80 90 100

Time for exposure during summer
Time for exposure during winter
Optimal duration for exposure
Optimal method for exposure

Boys
Girls

P = 0.865
P = 0.554
P = 0.062
P = 0.852
Gender Differences in Attitudes towards SSE among the Intervention Group

- Do you think you get a sufficient healthy amount of sun exposure? **P < 0.01**
- Do you think that there is a relationship between sun exposure and bone health? **P = 0.198**
- Do you intend to increase your sun exposure in the future? **P = 0.41**
Gender Differences in Practice of SSE among the Intervention Group

Percent Frequency of exposure to sunlight at least for 10 minutes

- **Almost daily (Always)**
  - Boys: 50%
  - Girls: 70%
- **3-4 times a week (Often)**
  - Boys: 30%
  - Girls: 40%
- **Once or twice a week (Sometimes)**
  - Boys: 20%
  - Girls: 30%
- **Never**
  - Boys: 10%
  - Girls: 10%

**P < 0.01**
Educational level Differences in Knowledge about SSE among the Intervention Group
Educational Stage Differences in Attitudes towards SSE among the Intervention Group

Percent of positive answers

- Do you think you get a sufficient healthy amount of sun exposure? *P < 0.01*
- Do you think that there is a relationship between sun exposure and bone health? *P = 0.04*
- Do you intend to increase your sun exposure in the future? *P < 0.01*

Primary | Intermediate | Secondary
Assessment of SSE Education Campaign among the Intervention Group

- Campaign message was clear & understandable
- Understanding the actual aim of the campaign

Percent of positive or right answers

- Primary
- Intermediate
- Secondary
- Overall

P < 0.01
Conclusion, Limitations and Recommendations
CONCLUSION

1. The results of this study demonstrate that a significant improvement in students’ knowledge and intentions about SSE may be affected by school-based health educational interventions.

2. It seems that primary school is an appropriate site and period to communicate messages about SSE.
LIMITATIONS

1. The **immediate** data collection after the educational campaign without allowing sufficient time to assess changes in practice

2. Constrained in **comparing** the effect size of the intervention with other national studies as they are scarce
RECOMMENDATIONS

1. **To involve** school staff in health educational interventions

2. **To consider** taking proactive steps to reduce the inclined abstainers (*i.e.* those who are in favor of change and yet persist in existing behaviors)

3. **To include** a long term follow up in future studies
ACKNOWLEDGMENT

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A Special THANK YOU
THANK YOU