EFFECTIVENESS OF EARLY IDENTIFICATION AND ELECTRONIC INTERVENTIONS FOR TEENS WITH RISK FACTORS FOR THE DEVELOPMENT OF HEART DISEASE AND DIABETES

Shenandoah University
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RESEARCH QUESTIONS

1. WHAT IS THE PREVALENCE OF RISK FACTORS FOR THE DEVELOPMENT OF HEART DISEASE AND DIABETES IN TEENS?

2. WHAT IS THE EFFECTIVENESS OF A TWO PART, REOCURRING ELECTRONIC EDUCATION PROGRAM (REEP) IN MINIMIZING SELECTED RISK FACTORS FOR HEART DISEASE AND DIABETES?
   - PHYSICAL SCREENING: BP, HR, HT, WT/BMI, GUM INFLAMMATION
   - SERUM SCREENING: TC, LDL, HDL, TRIG, RR, FBG, TSH, HGB A1C, VITAMIN D, AND HSCRP
REEP PLAN

- REEP 1
  - STEWII WEBSITE
  - CONFIDENTIAL INTERACTIVE HEALTH HISTORY AND LIFESTYLE SURVEY
  - DETAILED INFORMATION ABOUT RISK FACTORS AND LIFESTYLE MODIFICATIONS TO REDUCE RISK

- REEP 2
  - STEWII EMAILS
  - STEWII SMS
  - STEWII VOICEMAIL
  - STEWII PHONE APP
STUDY METHODOLOGY

QUASI-EXPERIMENTAL, DESCRIPTIVE/PRE-POST SURVEY/REPEATED MEASURES

- PHASE 1
  - PART 1:
    - RECRUITMENT AND ENROLLMENT
    - COMPLETION OF HEALTH HISTORY AND FIRST LIFESTYLE SURVEY
    - 1ST SCREENING AND DISTRIBUTION OF FIRST HEALTH INDICATOR REPORT
    - IMPLEMENTATION OF THE REEP 1 AND 2
  - PART 2:
    - REPEAT SCREENINGS AT 3 MO.
    - CONTINUATION OF REEP 1 AND 2

- PHASE 2: REPEAT SCREENING
  - STUDENTS WHO GRADUATED REMOVED FROM THE STUDY
  - DISTRIBUTION OF HEALTH INDICATOR REPORT
  - CONTINUATION OF REEP 1 AND 2
PHASE I FINDINGS

PRE & POST MEANS

<table>
<thead>
<tr>
<th></th>
<th>Pre Mean (SD)</th>
<th>Post Mean (SD)</th>
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<tbody>
<tr>
<td>SBP</td>
<td>121 (±14.5)</td>
<td>114 (±13.3)</td>
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<tr>
<td>DBP</td>
<td>77 (±9.6)</td>
<td>71 (±9.3)</td>
</tr>
<tr>
<td>BMI</td>
<td>24.9 (±6.0)</td>
<td>24.9 (±6.0)</td>
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PEARSON’S CORRELATIONS

✧ SIGNIFICANT POSITIVE CORRELATION BMI & DBP (P<0.01)
✧ SIGNIFICANT INVERSE CORRELATION BMI & HDL (P<0.05)
✧ SIGNIFICANT INVERSE CORRELATION BMI & VITAMIN D (P<0.01)
SCREENING & REEP EFFECTIVENESS

PRE AND POST SCREENING RISK FACTORS REVEALED STATISTICALLY SIGNIFICANT T-TEST RESULTS (P< 0.001), MEANING THERE WERE IMPROVEMENTS IN THE FOLLOWING VALUES:

- TSH
- FBG
- VITAMIN D
- HBA1C
- HDL
- GLUCOSE
PHASE II FINDINGS

<table>
<thead>
<tr>
<th></th>
<th>Round 2</th>
<th>Round 3</th>
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<tbody>
<tr>
<td></td>
<td>Mean (SD), Not Missing</td>
<td>Mean (SD), Missing</td>
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<tr>
<td>Glucose</td>
<td>111.73 (19.39), n = 103</td>
<td>107.74 (5.40), n = 38</td>
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<tr>
<td>HgbA1c</td>
<td>5.52 (0.67), n = 103</td>
<td>5.38 (0.19), n = 38</td>
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<tr>
<td>Tot chol</td>
<td>154.84 (27.01), n = 103</td>
<td>157.24 (28.58), n = 38</td>
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<tr>
<td>Triglycerides</td>
<td>87.58 (116.89), n = 103</td>
<td>90.92 (40.76), n = 38</td>
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<tr>
<td>HDL** (p = .01)</td>
<td>51.37 (10.65), n = 103</td>
<td>46.21 (9.70), n = 38</td>
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<tr>
<td>LDL</td>
<td>87.32 (22.52), n = 102</td>
<td>92.76 (23.08), n = 38</td>
</tr>
<tr>
<td>TSH</td>
<td>2.55 (1.43), n = 103</td>
<td>2.58 (1.46), n = 38</td>
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<tr>
<td>Vitamin D</td>
<td>21.35 (7.29), n = 103</td>
<td>21.45 (8.44), n = 38</td>
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*Note: HDL = high-density lipoprotein; HgbA1c = hemoglobin A1c; LDL = low-density lipoprotein; TSH = thyroid-stimulating hormone.*
TRANSLATION OF RESEARCH TO PRACTICE

• PHYSICAL & SERUM RISK FACTORS ARE DETECTABLE IN AS EARLY AS ADOLESCENCE

• ELECTRONIC INTERVENTIONS EFFECTIVE IN MODIFYING LIFESTYLE BEHAVIORS (NOTICEABLE PREFERENCE FOR HANDHELD/MOBILE DEVICES)

• OUR STUDY FOUND ALARMINGLY LOW LEVELS OF VITAMIN D (INSUFFICIENCY TO DEFICIENCY)

• OUR STUDY CONTRIBUTES TO THE GROWING LITERATURE AND KNOWLEDGE BASE ON EMERGING PREDICTORS OF FUTURE CHRONIC ILLNESS MARKERS (HSCRP & VITAMIN D)

• OUR STUDY SUPPORTS THE CALL FOR REGULAR SERUM/PHYSIOLOGICAL SCREENING OF RISK FACTORS IN TEENS