Identifying Risk and Protective Factors Related to Depressive Symptoms among Northern Plains American Indian Women Cancer Survivors

Soonhee Roh, PhD
Jarod T. Giger, PhD
Acknowledgment

➢ Funding
This research was supported by the National Institute on Minority Health and Health Disparities of the National Institutes of Health under Award number U54MD008164 (PI: Elliott)

➢ Community Advisory Board
- Rita Brokenleg, RN
- Sarah Brokenleg, MSW
- Melissa Buffalo, MSW
- Kathy Prasek, MA
- Chelsea Wesner, MSW

➢ External Consultant
- Daniel G. Petereit, MD, FASTRO
- David Starks, MD, MPH
- Hee Yun Lee, PhD
Partnerships

- Sanford Research Center, Sioux Falls, SD
- Avera Medical Group, Sioux Falls, SD
- Rapid City Regional Hospital, Rapid City, SD
- University of South Dakota, Vermilion, SD
Presentation Overview

- Background
- Research Purpose
- Conceptual Framework
- Method
- Results and Findings
- Discussion
- Limitations
- Implications
- Conclusions
Who are American Indians?

• 5.2 million American Indians and Alaskan Natives (AI/ANs) living in the U.S.

• 566 federally recognized and approximately 400 unrecognized tribes located across 35 states in U.S.

• 56% - 68% of the AI/AN population are classified as urban
Where do they reside?

- States with the highest percentage of AI/AN are: Alaska, Oklahoma, New Mexico, South Dakota and Montana.

- BUT... there are 13 states that have more than 100,000 AI/AN residents: California, Oklahoma, Arizona, Texas, New Mexico, Washington, New York, North Carolina, Florida, Michigan, Oregon, Colorado and Minnesota.
Economics and Poverty

- 29.9% of all families live below poverty line vs 18.8% for general population

- 48% of single female head of household live below poverty level vs 41% for general population of single female head of household

- 15.9% unemployment overall with 22.8% on reservation
500 Years of Health Disparities

- Long experienced lower health status when compared to other Americans.

- Lower life expectancy and higher disease burden exist perhaps because of broad quality of life issues rooted in economic adversity and poor social conditions.
Ten leading Causes of Death among AI/ANs

- Cancer
- Heart Disease
- Unintentional Injuries
- Diabetes
- Liver Disease
- Lower Respiratory Diseases
- Stroke
- Suicide
- Nephritis, Nephrotic Syndrome, Nephrosis
- Influenza & Pneumonia
American Indians in south Dakota

- 8.9% are AI/ANs in South Dakota
Cancer Disparities in South Dakota

- Cancer mortality rate approximately 40% higher than that of the overall US population in South Dakota.

- AIs in western SD present with more advanced states (stage 3 & 4) of cancer than do non-AIs in the region.

- According to Rapid city regional hospital tumor registry data, lung (72% vs 68%), breast (16% vs 10%), colorectal (48% vs 40%), and cervical (53% vs 26%) cancer mortality rate was higher than non-AIs in South Dakota.

- American Indian women suffer from striking health disparities in relation to cervical cancer, including higher prevalence, lower survival rates, and rapidly increasing incidences.

- This disparity can be attributed to multiple factors including late-stage diagnosis, limited access to appropriate medical care, poor health literacy related to the disease, trust issues, hopelessness, logistical problems (e.g., transportation, finances).
Purpose of the present study

» Examine the relationships among adverse childhood experiences, perceived health status, resilience, social support, and depressive symptoms among AI women cancer survivors in South Dakota.
Research questions

(1) What is the relationship between risk factors (perceived health and ACE) and depressive symptoms among AI women cancer survivors?

(2) What is the relationship between protective factors (resilience and social support) and depressive symptoms among AI women cancer survivors?
Research Hypotheses

1. Higher levels of ACE will be positively associated with higher levels of depressive symptoms.

2. Lower perceived health will be positively associated with higher levels of depressive symptoms.

3. Higher perceived social support will be associated with lower depressive symptoms.

4. Higher psychological resilience will be associated with lower depressive symptoms.
Conceptual framework
Resilience Theory (1)

- Resilience is defined as an individual's ability to properly adapt to stress and adversity.

- Resilience is a two-dimensional construct concerning both
  - the exposure of adversity; and
  - the positive adjustment outcomes of that adversity.

- Despite 500 years health disparities, AIs have demonstrated resilience in response to centuries of
  - historical trauma, loss, oppression, and higher disease burden

- Many researches with AI populations, however, has focused on risk factors related to behavioral health problems.
Conceptual framework
Resilience Theory (2)

➢ To offset this problem-focus, resilience, or positive adaptation in response to adversity is a useful theoretical framework.

➢ Adversities, or challenging life experiences, are characterized by risk factors, which increase the probability of negative outcomes.

➢ Protective factors, in contrast, are associated with positive life outcomes, and buffer the impact of adversity.

➢ The current study examined depressive symptoms among AI women cancer survivors introducing two significant factors.

  ● Protective factors: social support and resilience; and
  ● Risk factors: adverse childhood experiences (ACE) and perceived health status.
Conceptual Framework

**Socio-demographics**
- Age
- Cancer diagnosis
- Time with cancer

**Risk Factors**
- Adverse childhood experiences
- Perceived health status

**Protective Factors**
- Resilience
- Social support

**Depressive Symptoms**
- CES-D-SF

This presentation is supported by the National Institute on Minority Health and Health Disparities of the National Institute of Health under Award Number u54MD008164 (PI – Elliott)
Methods

Participants and Procedures

- Community Based Participatory Research (CBPR)
- 5 Community Advisory Boards (CABs)
- A cross-sectional survey design \( (N = 73) \)
- Non-probability sampling
- 18 years or older participants recruited in Avera and Rapid City Regional hospitals in South Dakota between July 2014 and Feb 2015
- $20 cash incentive
- $100 credit card for gas fee support
- 4 Institutional Review Board (IRB) approvals
Methods (cont’d)

**Measures**

- **Dependent Variable:** Depressive symptoms
  - Center for Epidemiologic Studies Depression Scale- Short Form (CES-D-SF)

- **Risk Factors:**
  - Adverse Childhood Experiences Scale (ACE)
  - Perceived Health Status

- **Protective Factors:**
  - Resilience (Connor-Davidson Resilience Scale)
  - Social Support (Medical Outcomes Study Social Support scale)
<table>
<thead>
<tr>
<th>Variables</th>
<th>Questionnaire Items</th>
<th>Item #</th>
<th>Response Categories</th>
<th>Score Ranges</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Factors</td>
<td><strong>Perceived health status</strong>&lt;br&gt;How would you rate your overall physical health at the present time?</td>
<td>1</td>
<td>4 point Likert Responses&lt;br&gt;(1) poor to (4) excellent</td>
<td>1-4</td>
<td>N/A</td>
</tr>
<tr>
<td>Adverse Childhood Experiences (ACE)</td>
<td>11 types of childhood adversity among 3 domains of childhood abuse: emotional, sexual, and physical abuse, physical neglect, &amp; abuse associated with living in a dysfunctional household.</td>
<td>11</td>
<td>Participants responded either yes (1) or no (0).&lt;br&gt;<em>Higher scores indicate greater exposure to childhood maltreatment.</em></td>
<td>0-11</td>
<td>α=.78</td>
</tr>
</tbody>
</table>

| Protective Factors                     | **Social support:**<br>MOS social support scale By Sherbourne & Stewart (1991)<br>1. Instrumental support (3-item): (1) Take to the doctor, (2) Preparing meals, and (3) Helping daily chores<br>2. Emotional support (7-item): (1) Good advice, (2) Having a good time, (3) Talking about problems, (4) Showing love, (5) Sharing private worry, (6) Suggestions for personal problems, & (7) Making feeling wanted | 10    | 5-point Likert response:<br>1=Seldom, 2=Sometimes, 3=Often, 4=Very often, and 5=Always<br>*Higher scores reflect greater social support.* | 10-50         | α=.78  |

| Resilience                             | **Resilience**<br>Connor-Davidson Resilience Scale (CD-RISC) Campbell-Sills & Stein, 2007<br>10 questionnaire examples - How did you note the frequency with which you experienced each item during the past 30 days “Able to adapt to change” “Can deal with whatever comes” | 10    | 5-point response scale<br>0 = not true at all to 4 = true most of the time<br>*Higher scores reflect greater resilience.* | 0-40          | α=.90  |

| Outcome variable                       | **Depression:**<br>CES-D By Radloff (1977)<br>Depressive feeling or behavior<br># 0-9:no problem<br>10 or greater is: considered depressed<br>“I felt fearful”<br>“I felt depressed”<br>“My sleep was restless” | 10    | 4-Point Likert response:<br>0=Rarely or none of the time (<1day)<br>1=Some or a little of the time (1~2days)<br>2=Occasionally (3~4days)<br>3=Most or all the time (5~7days) | 0-30          | α=.79  |
## Results

### Table 1
Demographic Characteristics of the sample ($N = 73$)

<table>
<thead>
<tr>
<th></th>
<th>Age, $M (SD)$</th>
<th>Education, $n$ (%)</th>
<th>Perceived health, $n$ (%)</th>
<th>Monthly household income, $n$ (%)</th>
<th>Type of cancer, $n$ (%)</th>
<th>Time with cancer</th>
<th>Adverse Childhood Experience, $M (SD)$</th>
<th>Resilience</th>
<th>Social support, $M (SD)$</th>
<th>Depressive symptoms, $M (SD)$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range: 32 to 77 years</td>
<td>Lower than high school diploma/GED</td>
<td>Poor or fair</td>
<td>Less than $1,499</td>
<td>Breast</td>
<td>Ranged from 3 month to 10 years</td>
<td>Ranged from 0 to 9</td>
<td>Ranged from 12 to 40</td>
<td>Ranged from 14 to 96</td>
<td>Ranged from 0 to 24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High school diploma/GED</td>
<td>Good or excellent</td>
<td>$1,500 - $2,999</td>
<td>Cervical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Normal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Greater than high school diploma/GED</td>
<td></td>
<td>More than $3,000</td>
<td>Colon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Probable depression</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lung</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Non-Hodgkin Lymphoma</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Others</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2

*Intercorrelations and Bias Corrected and Accelerated 95% Confidence Intervals (BCa 95% CI)*
Between Depressive symptoms and Predictor Variables

<table>
<thead>
<tr>
<th>Measure</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CES-D</td>
<td>--</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Age</td>
<td>.24</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[-.23, .28]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Cancer</td>
<td>.17</td>
<td>.28*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dx</td>
<td>[-.07, .38]</td>
<td>[-.00, .54]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Time with Cancer</td>
<td>-.14</td>
<td>.25*</td>
<td>.26*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[-.36, .11]</td>
<td>[.03, .45]</td>
<td>[.02, .49]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Perceived health</td>
<td>-.50**</td>
<td>-.17</td>
<td>-.13</td>
<td>-.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. ACE</td>
<td>.05</td>
<td>-.05</td>
<td>.11</td>
<td>.08</td>
<td>-.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Resilience</td>
<td>-.52**</td>
<td>-.01</td>
<td>-.22</td>
<td>.01</td>
<td>.26*</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[-.65, -.38]</td>
<td>[-.26, .23]</td>
<td>[-.45, .02]</td>
<td>[-.23, .26]</td>
<td>[.03, .47]</td>
<td>[-.21, .22]</td>
<td></td>
</tr>
<tr>
<td>8. Social Support</td>
<td>-.52**</td>
<td>-.13</td>
<td>-.08</td>
<td>.13</td>
<td>.21</td>
<td>-.22</td>
<td>.36**</td>
</tr>
<tr>
<td></td>
<td>[-.64, -.41]</td>
<td>[-.36, .08]</td>
<td>[-.28, .13]</td>
<td>[-.13, .36]</td>
<td>[.00, .40]</td>
<td>[-.40, -.01]</td>
<td>[.13, .56]</td>
</tr>
</tbody>
</table>

*Note:* Significant robust correlation coefficient confidence intervals are emboldened. Pearson correlations and BCa 95% CI’s were calculated. Bootstrap procedures used 10,000 resamples with replacement to calculate CIs. CES-D = Center for Epidemiologic Studies Depression. Cancer Dx = Cancer diagnosis. ACE = Adverse Childhood Experiences. *p < .05, **p < .01.
## Hierarchical Regression

### Table 3

Hierarchical Regression Analysis Summary for Variables Predicting Depression (N = 73)

<table>
<thead>
<tr>
<th>Step &amp; predictors</th>
<th>B</th>
<th>SE B</th>
<th>BCa 95%</th>
<th>β</th>
<th>R²</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.006</td>
<td>.06</td>
<td>[-.12, .14]</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer Dx</td>
<td>.56</td>
<td>.324</td>
<td>[-.18, 1.33]</td>
<td>.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time with Cancer</td>
<td></td>
<td></td>
<td>[-.71, .10]</td>
<td>-.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACE</td>
<td>-.04</td>
<td>.025</td>
<td>[-.60, .46]</td>
<td>-.02</td>
<td></td>
<td>.23</td>
</tr>
<tr>
<td><strong>Perceived health</strong></td>
<td>-3.22</td>
<td>.69</td>
<td>[-4.56, -1.81]</td>
<td>-.49**</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 3:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.53</td>
</tr>
<tr>
<td>Resilience</td>
<td>-.22</td>
<td>.08</td>
<td>[-.38, -.07]</td>
<td>-.27**</td>
<td></td>
<td>.23</td>
</tr>
<tr>
<td>Social Support</td>
<td>-.14</td>
<td>.04</td>
<td>[-.25, -.07]</td>
<td>-.36**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: ** p < .01. *** p < .001. BCa 95% CIs = Bias Corrected and Accelerated 95% Confidence Intervals. Cancer Dx = Cancer diagnosis. ACE = Adverse Childhood Experiences. Bootstrap procedures used 10,000 resamples with replacement to calculate CIs.*
Findings

**Risk Factors**
- Perceived health status

**Protective Factors**
- Resilience
- Social Support

- Support a growing body of literature documenting an inverse relationship between resilience, social support, and depressive symptoms among cancer survivors.
Discussion

➢ Depression:

For depressive symptoms, the mean score was 9.31. Utilizing CES-D-SF categories, about 47% of participants could be classified as depressed (≥ 10).

➢ Indicate these symptoms were prominent across AI survivors of cancer
Failed to reject H1, investigating whether ACE was positively associated with higher levels of depressive symptoms.

- Contrary to other studies, which have found dimensions of ACE to predict depressive symptoms in AIs.

- Very low to non-existent correlations of ACE with other main variables indicate variability of relevant factors across diverse AI populations.

- Future research can investigate this hypothesis with other AI samples and examine whether specific components of ACE may be risk factors for depressive symptoms.
Discussion (cont’d)

- Rejected H2, indicating lower perceived health was positively associated with depressive symptoms.

- Finding is parallel to other research identifying perceived poor health as a risk factor related to depressive symptoms and indicates that, like other chronic health conditions cancer may increase the risk for depression.
Discussion (cont’d)

- Rejected H3 & H4.

- Both hypothesis three and four (higher perceived social support and higher psychological resilience) were associated with lower depressive symptoms, which is consistent with other research highlighting these protective factors related to depression among cancer patients.
Limitations

- Non-probability sampling limits generalizability of the findings to the entire AI population.

- Cross-sectional design of the current study is not appropriate for exploring causal relationships between the variables.

- Data on tribal membership were not collected, so we could not examine tribal differences on any of the examined variables.

- Possible biases in data collection.

- Validity of the measurements with this population is still unknown.
Implications

- Assessment of level of assimilation
- Spiritual assessment
- Recognize the importance of extended family
- Therapeutic services with AI clients may include:
  - Discussion of issues related to stereotyping, justified anger, positive identity development, ceremony
  - Rituals and ceremonial processes that incorporate culture into the treatment process (i.e., Eagle feathers and pipes, smudging, sweat lodges)
Holistic treatment

- Addressing the treatment needs of AI/ANs within a holistic approach incorporates the concepts of balance, harmony, relational and the connection between the physical, mental, emotional, and spiritual self.
Conclusions

- With the full hierarchical regression model accounting for 50% of the variance, results revealed significant correlates of depressive symptoms.

- Greater perceived health status, higher level of resilience, and greater level of social support were significantly associated with lower depressive symptoms among AI women cancer survivors in South Dakota.
  - Potentially modifiable factors

- Resilience theory is well-suited to examine correlates of depressive symptoms among AIs as it includes risk and protective factors.

- Other approaches to improving screening and prevention of depressive symptoms among AI women cancer survivors and communities can include improving tribal infrastructure and resources to educate, training, and conduct community outreach, as well as increasing community participation in developing culturally sensitive intervention and prevention strategies.
Question and Answer

Pilamayaye!
Thank you!