Mental health and substance use among US adults: An analysis of 2011 Behavioral Risk Factor Surveillance Survey

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Background

• Nearly 25% of adults in the United States (U.S.) suffer from mental illness in any year.
• Nearly 50% of all U.S. adults: likely to be affected by at least one mental illness during their life!
• Mental distress: Negative impact on quality of life.
• Evidences suggest role of substance use in mental distress.
Objectives

To examine the relationship between mental health and substance abuse among adults in the United States.
Methods

• Secondary analysis of 2011 Behavioral Risk Factor Surveillance Survey (BRFSS) data.
• 2011 BRFSS data: SAS Transport Format downloaded.
• 2011 BRFSS Codebook downloaded.
• SPSS Version 21 and SAS version 9.3 used for data exploration and analysis.
Dependent variable

• Variable: “Number of days mental health not good”.
• Coded in dataset: MENTHLTH
• Question: “Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?”
• Arbitrary categorization:
  ➢ Respondents who answered 1 day or more: poor mental health.
  ➢ Others: Not in poor mental health.
Table 1: List of independent variables: Socio-demographics

<table>
<thead>
<tr>
<th>Variable</th>
<th>SAS Variable Name in dataset</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>SEX</td>
<td>Male; Female</td>
</tr>
<tr>
<td>Age category (years)</td>
<td>_AGE_G</td>
<td>18-24; 25-34; 35-44; 45-54; 55-64; 65 or older</td>
</tr>
<tr>
<td>Race and ethnicity</td>
<td>_IMPRACE</td>
<td>Non-Hispanic White; non-Hispanic Black; Asian; American Indian/ Alaska Native; Hispanic; Other race</td>
</tr>
<tr>
<td>Education completed</td>
<td>_EDUCAG</td>
<td>Did not graduate high school; graduated high school; attended college/technical school; graduated from college/technical school</td>
</tr>
<tr>
<td>Employment status</td>
<td>EMPLOY</td>
<td>Employed for wages; self-employed; out of work for &gt;1 year, out of work &lt; 1 year; homemaker; student; retired; unable to work</td>
</tr>
<tr>
<td>Income category</td>
<td>_INCOMG</td>
<td>&lt;15,000; 15,000 to &lt;25,000; 25,000 to &lt;35,000; 35,000 to &lt; 50,000; 50,000 or more</td>
</tr>
<tr>
<td>Marital status</td>
<td>MARITAL</td>
<td>Married, divorced, widowed, separated, never married, a member of an unmarried couple</td>
</tr>
</tbody>
</table>
**Table 2: List of independent variables: Behavioral factors**

<table>
<thead>
<tr>
<th>Variable</th>
<th>SAS Variable Name in dataset</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current smoking frequency</td>
<td>SMOKDAY2</td>
<td>Every day; some days; not at all</td>
</tr>
<tr>
<td>Current frequency of using smokeless tobacco products</td>
<td>USENOW3</td>
<td>Every day; some days; not at all</td>
</tr>
<tr>
<td>Consumption of alcoholic drink during the previous 30 days</td>
<td>AVEDRNK2</td>
<td>At least one drink; not at all (One drink: equivalent to a 12-ounce beer, a 5-ounce glass of wine, or a drink with one shot of liquor).</td>
</tr>
<tr>
<td>Binge drinking during the previous 30 days</td>
<td>DRNK3GE5</td>
<td>At least once; Never (Binge drink: 5 or more drinks for men or 4 or more drinks for women on a single occasion).</td>
</tr>
<tr>
<td>Physical health during the previous 30 days</td>
<td>PHYSHLTH</td>
<td>“Not good” on at least one day; Good on all the days</td>
</tr>
<tr>
<td>Physical activity</td>
<td>EXERANY2</td>
<td>Participated in some physical activity or exercises, other than regular job; Did not participate in any.</td>
</tr>
</tbody>
</table>
Data Analysis

• Descriptive statistics.
• Chi-square tests of independence: each independent variable with mental health.
• Simple logistic regression.
• Multivariable logistic regression: all variables entered.
• Multivariable model: Adjusted for sampling design and individual respondent weights.
• Participants responding as “don’t know”/ “not sure”/ “refused”: excluded from analysis
Figure 1: Distribution of the 2011 BRFSS sample (%) according to their mental health status in the previous 30 days (N=496702)

- Not good for at least one day: 31.5%
- Good for all the days: 68.5%
Figure 2: Gender and mental health in the previous 30 days (N=496702)

- Male: 144205 Good on all days, 51110 Not good at least for one day
- Female: 196108 Good on all days, 105279 Not good at least for one day
Summary of bivariate analysis

Proportion of respondents reporting “not good” mental health for at least one day:

- Highest in the youngest age group (44.8%), decreased progressively with age (20.2% in the oldest age group): P<0.0001.
- Higher in those unable to work (60.74%), students (46.23%) and those out of work (45-47%): P<0.0001.
- Decreases progressively with increasing annual income: 45% in <15,000$ category, 28% in 50,000$ or more: P<0.0001
- Highest among respondents belonging to other races (40%) and lowest among Asians (23%): P<0.0001
Figure 3: Current smoking frequency and mental health in the previous 30 days (N=496486)
Figure 3: Binge drinking and mental health in the previous 30 days (N=494266)

- **Not a single occasion**
  - Good on all days: 302095
  - Not good at least for one day: 132116

- **At least one occasion**
  - Good on all days: 36621
  - Not good at least for one day: 23434

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Figure 5: Physical health and mental health in the previous 30 days (N=494266)
### Table 3: Multivariable logistic regression

<table>
<thead>
<tr>
<th>Items</th>
<th>Children completed routine vaccination (N=778)</th>
<th>95% Confidence Interval (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adjusted Odds Ratio(^a) (OR)</td>
<td></td>
</tr>
<tr>
<td>Current smoking (<em>Ref: Smokes everyday</em>)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smokes some days</td>
<td>0.97</td>
<td>0.90-1.05</td>
</tr>
<tr>
<td>Never smokes</td>
<td>0.76</td>
<td>0.73-0.79</td>
</tr>
<tr>
<td>At least one occasion of binge drinking in the previous 30 days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(<em>Ref: Not a single occasion</em>)</td>
<td>1.25</td>
<td>1.20-1.30</td>
</tr>
<tr>
<td>At least one occasion of drinking alcoholic beverage in the previous 30 days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(<em>Ref: Not a single occasion</em>)</td>
<td>1.15</td>
<td>1.12-1.19</td>
</tr>
</tbody>
</table>

\(^a\) Only the tobacco and alcohol use variables that were statistically significant are shown here. In addition to these, all the socio-demographic and behavioral variables were entered in the model.
Discussion

• Females have significantly higher prevalence of “not good” mental health compared to men.
• Proportion of participants in poor mental health decreases with age.
• Non-Hispanic Blacks, Asians and Hispanics have lower proportion of poor mental health compared to non-Hispanic Whites.
• Prevalence of poor mental health decreases with increase in income.
Discussion (contd.)

• Compared to those who are married, prevalence is higher in all others.
• Participants not currently smoking at all: lower prevalence of poor mental health compared to those who smoke everyday.
• Binge drinkers: higher prevalence.
• Poor physical health: more likely to suffer from poor mental health.
Limitations

• Arbitrary classification of the no. of days mental health not good.
• Listwise deletion of missing cases during analyses.
• Other covariates not taken into account: e.g. sleeping habits, dietary factors, social support, adverse childhood experiences, etc.
• Secondary data analysis.
• Single time point: Causality cannot be inferred.
• Any other substance use: not asked.
Strengths

• Large nationally representative sample.
• Multiple socio-demographic and behavioral variables controlled for.
• Sampling design and participant weights taken into consideration in multivariable analysis.
• Participants’ own perception of their health status.
Conclusion

• Tobacco and alcohol use increase the odds of poor mental health.
• Binge drinking increases the odds.
• Behaviors, such as, substance use can predict poor mental health and vice versa.
• Future longitudinal studies needed.
Thank you!

Questions?