Contributions of Epidemiology to our Understanding and Treatment of Depression

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Questions

◆ How can epidemiology inform understanding and treatment of depression?
◆ What do we know about depression in youth identified in community samples?
◆ How can we apply this knowledge to clinical settings?
Epidemiology
Descriptive Epidemiology
Major Goal of Epidemiology

- to identify the etiology of a disease and thereby prevent or intervene in the progression of the disorder
The Epidemiologic Triangle

Host

Environment

Agent
Most studies of depression are based on clinical samples

Spectrum of illness:

Most diseases demonstrate a range of manifestations and severity
Contributions of Epidemiology

- Prevalence, incidence and impact of diseases
- Generalizability of clinical samples
- Spectrum of expression of disorders in the population
- Risk estimation of demographic, psychosocial, neurobiologic and genetic risk factors and their combined influences
- Environmental risk factors, “agents” (e.g., viral exposure, toxins, diet, stress)
WORLD MENTAL HEALTH SURVEYS

Brazil, Colombia, Costa Rica, Mexico, Peru, United States, Nigeria, South Africa, Lebanon, Iraq, Belgium, Bulgaria, France, Germany, Israel, Italy, Netherlands, Northern Ireland, Portugal, Romania, Spain, Turkey, Ukraine, India, China Beijing, China Shanghai, Japan, and New Zealand
Disability Adjusted Life Years: Depression has greatest impact

(Ferrari et al, 2016)
Depression in Youth
Worldwide Prevalence Rates of Mental Disorders In Youth

Mental disorders and mental health problems appear in families of all social classes and of all backgrounds. No one is immune....
National Comorbidity Survey
Adolescent Supplement

N=10,123

NIH
National Institute of Mental Health
<table>
<thead>
<tr>
<th>Informant</th>
<th>Age</th>
<th>Total N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent</td>
<td>13-18</td>
<td>6,491</td>
</tr>
<tr>
<td>Youths</td>
<td>13-18</td>
<td>10,123</td>
</tr>
</tbody>
</table>
Cumulative Lifetime Incidence of Major Depression by Sex, NCS-A
Cumulative Lifetime Incidence of MDD by Sex and Severity: NCS-A

- Female, Non-Severe
- Male, Non-severe
- Female, Severe
- Male, Severe

Cumulative Lifetime Incidence %

Age in Years

National Institute of Mental Health
Structure of symptoms of depression in US Youth

Lamers et al, 2016
N of Classes of Disorders among those with Major Depression

- One: 37.4%
- Two: 23.9%
- ≥3: 8.9%
- MDD alone: 29.8%
Rates of Comorbid MDD among Youth with Other Index Disorders

- Generalized Anx
- PTSD
- Mania
- Eating
- Social Phobia
Mental disorders and medical comorbidity
Comorbid Medical Conditions & Mood Disorders
Correlates and Risk Factors for Depression

- Female > Male
- Increasing Age
- Whites > non-whites
- Non-intact home
- Family history of depression
- Traumatic events
- Pre-existing mental or physical condition
Consequences of Depression

- Educational Failure
- Drug Abuse
- Alcohol Problems
- Social difficulties/Isolation
- Family disruption
- Suicide
Suicidality among youth with MDD

MDD by Suicidality

<table>
<thead>
<tr>
<th>Percent, %</th>
<th>Ideation</th>
<th>Plan</th>
<th>Attempt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40.1</td>
<td>16.8</td>
<td>17.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percent, %</th>
<th>Among ideation cases</th>
<th>Among plan cases</th>
<th>Among attempt cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>36.0</td>
<td>47.0</td>
<td>52.8</td>
</tr>
</tbody>
</table>
Implications for Treatment & Prevention
Relevance to Interventions

- Comorbidity
- Core features/components of depression
Temporal Order of MDD and Other Classes of Comorbid Disorders: NCS-A

- ADHD
  - MDD onset earlier: 10%
  - The same time: 30%
  - MDD onset later: 60%

- Anxiety
  - MDD onset earlier: 10%
  - The same time: 30%
  - MDD onset later: 60%

- Behavior
  - MDD onset earlier: 20%
  - The same time: 40%
  - MDD onset later: 40%

- Substance
  - MDD onset earlier: 30%
  - The same time: 70%

- Any
  - MDD onset earlier: 20%
  - The same time: 80%
Focus on core components of depression

- Sleep
- Physical Activity/Energy
- Cognitive components:
  - Attention/concentration
  - Reward/pleasure
  - Reactivity of mood
  - Interpersonal sensitivity
Sleep Duration among Adolescents: NCS-A

Zhang et al, 2016
# Sleep Duration & Mental Health among Adolescents, NCS A (Odds Ratios)

<table>
<thead>
<tr>
<th>MENTAL HEALTH</th>
<th>&lt; 7 hours</th>
<th>&gt; 8 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suicidality</td>
<td>1.7*</td>
<td>0.8</td>
</tr>
<tr>
<td>Perceived Mental Health</td>
<td>1.5*</td>
<td>0.8</td>
</tr>
<tr>
<td>Mood Disorder</td>
<td>2.1*</td>
<td>0.9</td>
</tr>
<tr>
<td>Anxiety Disorder</td>
<td>1.3</td>
<td>1.1</td>
</tr>
<tr>
<td>Substance Disorder</td>
<td>1.7*</td>
<td>1.1</td>
</tr>
<tr>
<td>Any Mental Disorder</td>
<td>1.6*</td>
<td>1.1</td>
</tr>
</tbody>
</table>
Change in Sleep with Later School Start Time (NCS-A)

Average School Start Time in US: 7:55 am

$\beta = 28.31 \ (14.02-42.35)$

Paksarian et al, 2017
Mobile technologies for tracking sleep, daily activity, behaviors and mood states

- Mood
- Activity
- Energy
- Reactivity
- Food intake
- Stress
- Headache; pain

2 weeks

4 times per day
Inter-relationships of Domains Assessed with Actigraphy & Electronic Diaries

Time of Day

12:00 am  8:00 am  12:00 pm  4:00 pm  8:00 pm  12:00 am
Implications for Treatment & Prevention

- **Comorbidity**: Comprehensive evaluation of full spectrum of mental and physical conditions

- **Core manifestations**: Focus on salient features of depression rather than “aggregate” major depressive disorder

- **Follow up**: Temporal tracking of symptoms and function using mobile and on-line approaches

- **Prevention**: Primary prevention of secondary disorders & consequences of depression

- **Integration of context**:
  - Family
  - School
  - Peer
Thank you!