The Stressor in Adolescence of Menstruation: Economic Analysis of Effective Coping Strategies

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OCTOBER 2018
HPRC 2018
Menstrual hygiene management (MHM) is a growing subfield of WASH research in developing world. Girls often face confusion and surprise, coupled with cultural taboos/stigmas. Lack of knowledge, hygienic behavior, and supporting infrastructure/access. Links have been found between reproductive tract infections (RTIs) & poor menstrual hygiene (Anand, Singh, and Unisa 2015; Ranabhat et al. 2015). Missed opportunities at school, including dropping-out (WHO, 2014).

Lack of quantitative evidence in research on MHM & lack of specific focus on emotional consequences. This work attempts to fill some of these gaps by examining emotional/psychological wellbeing (not just attendance rates or knowledge). Framed by the Transactional Model of Stress & Coping.
BACKGROUND
Menstruation & Emotional Wellbeing

- Gap in MHM literature with regard to cognitive experiences
  - Usually appears as side note or is analyzed from psychology/sociological perspective from afar
  - Kenya → girls missed school due to fears of embarrassment/harassment and this “emotional geography” serves to only reinforce gender inequalities (Jewitt & Ryley, 2014)
  - Females adopt a sexualization of women from society and internalize it to make menstruation “bad”, e.g. “Objectification Theory” (Grose & Grabe, 2014)

- Is evidence of emotional damage during menstruation
  - Reported shame & fear of menstruation occurring at school (McMahon et al, 2011)
  - Evidence that feeling of depression, irritability, and stress reduced with health education intervention (Haque et al, 2014)
Context & Research in Nepal

- Strong cultural taboos surrounding menstruation, due to superstitions surrounding impurity of blood
  - Chhaupadi: practice of requiring menstruating girls/women live in a separate hut during menstruation (Katz, 2014)
  - Limitations on cooking, worshiping, and visiting family/friends

- Prior Research on MHM
  - 92% of girls heard of menarche prior to start, but not details → first menstruation a shock (WaterAid, 2009; Adhikari et al, 2007)
  - 50% of girls missed school and 82% did not participate in cultural functions (Auemaneeukul et al, 2013)
  - 36% of schools have a separate toilet for girls (Sommer et al, 2012)

- Key series of quantitative work is by Oster & Thornton (2009, 2011) focused on random provision of sanitary supplies in rural Nepal
  - Found no significant impact on attendance rates (!)
DATA & METHODOLOGY
Data

- Primary Survey Data (May 2016 & December 2017)
  - May → Bhairahawa (aka Siddharthnagar), 2 Schools
  - December → Purkot, 1 School
  - N = 310

- Collected by Pratiman-Neema Memorial Foundation (PNMF) in conjunction with non-profit Women2Be who provided reusable feminine hygiene kits
  - Demographics
  - Current Knowledge & Menstrual Hygiene Practices
  - Current School Infrastructure (Perceived)
  - Cultural Practices During Menstruation
  - “Do [girls] feel lonely and sad during menstruation cycle?”
Conceptual Framework - Transactional Model of Stress & Coping

- Positions stressful life events as “person-environment transactions” (R.S. Lazarus, 1966; R. S. Lazarus & Cohen, 1977)

- Four Key Constructs
  - Primary Appraisal
    - Evaluation of the stressor itself & consideration of susceptibility/severity and motivational relevance
  - Secondary Appraisal
    - Evaluation of the controllability of the stressor & person’s coping resources (includes self-efficacy)
  - Coping Efforts
    - Problem-Management → changing situation itself (active coping, problem solving, information seeking)
    - Emotional-Regulation → changing feelings surrounding stressor (venting, social support seeking, denial/avoidance)
  - Coping Outcomes
    - Health behaviors, functional status, or emotional wellbeing
Figure 1: Transactional Model of Stress & Coping

**Hypothesis #1**: The presence of infrastructure and education to support hygiene in schools will help adolescent females to feel less lonely or sad during menstruation.

Perceptions of tools necessary to deal with the stressor (menstruation) will impact self-efficacy beliefs, influence coping efforts, and impact emotional wellbeing.

**Hypothesis #2**: Strong cultural norms which restrict adolescent girl’s mobility and freedom during menstruation will lead them to experience more negative emotional wellbeing.

- Social support is a key moderator of the model, and has been shown to be a “stress-buffer” (Heitzmann & Kaplan, 1988; Cohen & Wills, 1985; Christian & Stoney, 2006)
- The lack of social support found with isolation and behavior restrictions could remove these buffering benefits
- Avoidance/Denial coping strategies been shown to be maladaptive and increase adverse psychosocial outcomes (Carver et al, 1993; Schwartz et al, 1995; Cordova et al, 2001; Zakowski et al, 2004)
- Prior evidence in literature of gender-focused cultural limitations surrounding stressful life events leading to lower mental/emotional wellbeing
Empirical Specification

\[ PWB_i^* = \begin{cases} 
1 & \text{if} \quad \beta_0 + \beta_1 \text{SchEnv}_i + \beta_2 \text{CultFactors}_i + \beta_3 \text{Age}_i + \beta_4 \text{AgeSq}_i + \beta_5 X_i + \varepsilon_i > 0 \\
0 & \text{Otherwise} 
\end{cases} \]

Where:

- \( PWB = \) Binary DV of feeling sad/lonely
- \( \text{SchEnv} = \) Index representing perceptions of school environment/infrastructure presence
- \( \text{CultFactors} = \) Two indices representing perceptions of the community & family culture environment
- \( X = \) Vector of socioeconomic & demographic controls
  - Married, Wealth Index, Current Type of Hygiene Product Use
Empirical Approach

- **Index Building**
  - Used principle component analysis (PCA) & confirmed findings with multiple correspondence analysis (MCA)
  - **School:**
    - One component meets Kaiser rule (Rabe-Hesketh & Everitt, 2004) for eigenvalue >1 → heavily loaded with hard infrastructure (bin, soap, hygiene kits)
  - **Culture:**
    - Two components with eigenvalue >1 → factor loadings based on community & family behavioral restrictions

- **Logistic Regression**
  - Explored inclusion of fixed effects, caste dummies, and controls vector
  - Robustness Checking (outlier removal, bootstrapping, inclusion of additional school binary for counseling)
RESULTS
Basic Statistics

- **Average Age = 17.6**
- 21.6% use old rags/cloths, 12.9% reusable
- 58.9% report pain, but less than 30% take actions to alleviate
- 9.6% use antiseptic when washing products
- 42.3% know of drop-out
- 33.8% missed school for menses
  - 30% miss more than a day (max 7)
- 68.9% claim life hard/very hard during menstruation

**Figure 2: Menstrual Hygiene Practices**

![Bar chart showing usage percentages of different menstrual hygiene practices.](chart.png)

Source: Nepal Study Center, UNM. 2016-2017
Table 2: Marginal Effects of Logistic Regression - Impact of Perceived Support on Psychological Wellbeing

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Base Model</th>
<th>(2) Model 2</th>
<th>(3) Model 3</th>
<th>(4) Model 4</th>
<th>(5) Model 5</th>
<th>(6) Model 6</th>
<th>(7) Model 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Cultural Environ.</td>
<td>0.0425*</td>
<td>0.0502**</td>
<td>0.0442*</td>
<td>0.0482**</td>
<td>0.0520**</td>
<td>0.0409*</td>
<td>0.0457*</td>
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<td></td>
<td>(0.0230)</td>
<td>(0.0232)</td>
<td>(0.0235)</td>
<td>(0.0232)</td>
<td>(0.0232)</td>
<td>(0.0234)</td>
<td>(0.0235)</td>
</tr>
<tr>
<td>Family Cultural Environ.</td>
<td>0.0370</td>
<td>0.0352</td>
<td>0.0405</td>
<td>0.0337</td>
<td>0.0328</td>
<td>0.0386</td>
<td>0.0383</td>
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<tr>
<td></td>
<td>(0.0269)</td>
<td>(0.0257)</td>
<td>(0.0252)</td>
<td>(0.0268)</td>
<td>(0.0257)</td>
<td>(0.0264)</td>
<td>(0.0254)</td>
</tr>
<tr>
<td>School Support Environ.</td>
<td>-0.0343*</td>
<td>-0.0713**</td>
<td>-0.0845***</td>
<td>-0.0567**</td>
<td>-0.0782**</td>
<td>-0.0636***</td>
<td>-0.0885***</td>
</tr>
<tr>
<td></td>
<td>(0.0201)</td>
<td>(0.0308)</td>
<td>(0.0308)</td>
<td>(0.0222)</td>
<td>(0.0311)</td>
<td>(0.0231)</td>
<td>(0.0310)</td>
</tr>
<tr>
<td>Age</td>
<td>0.234**</td>
<td>0.216*</td>
<td>0.214*</td>
<td>0.226**</td>
<td>0.201</td>
<td>0.213**</td>
<td>0.200*</td>
</tr>
<tr>
<td></td>
<td>(0.0977)</td>
<td>(0.124)</td>
<td>(0.117)</td>
<td>(0.103)</td>
<td>(0.125)</td>
<td>(0.104)</td>
<td>(0.122)</td>
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<tr>
<td>Age Sq.</td>
<td>-0.00667**</td>
<td>-0.00673*</td>
<td>-0.00679**</td>
<td>-0.00629**</td>
<td>-0.00606*</td>
<td>-0.00607**</td>
<td>-0.00619*</td>
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<tr>
<td></td>
<td>(0.00277)</td>
<td>(0.00348)</td>
<td>(0.00327)</td>
<td>(0.00295)</td>
<td>(0.00353)</td>
<td>(0.00292)</td>
<td>(0.00343)</td>
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<tr>
<td>Fixed Effects</td>
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<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>Caste</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Control</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
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<td>310</td>
<td>310</td>
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</tr>
</tbody>
</table>

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1
## TABLE 3A: Robustness Checks on Marginal Effects of Model 2

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Model 2</th>
<th>(2) Remove Older Outliers</th>
<th>(3) Remove DBETA &gt;0.6</th>
<th>(4) Remove DBETA &gt;0.6 &amp; Older Outliers</th>
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</thead>
<tbody>
<tr>
<td>Community Cultural Environ.</td>
<td>0.0502**</td>
<td>0.0511**</td>
<td>0.0488**</td>
<td>0.0496**</td>
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<tr>
<td></td>
<td>(0.0232)</td>
<td>(0.0242)</td>
<td>(0.0229)</td>
<td>(0.0238)</td>
</tr>
<tr>
<td>Family Cultural Environ.</td>
<td>0.0352</td>
<td>0.0361</td>
<td>0.0270</td>
<td>0.0276</td>
</tr>
<tr>
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<td>(0.0257)</td>
<td>(0.0267)</td>
<td>(0.0256)</td>
<td>(0.0266)</td>
</tr>
<tr>
<td>School Support Environ.</td>
<td>-0.0713**</td>
<td>-0.0731**</td>
<td>-0.0855***</td>
<td>-0.0878***</td>
</tr>
<tr>
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<td>(0.0308)</td>
<td>(0.0322)</td>
<td>(0.0310)</td>
<td>(0.0324)</td>
</tr>
<tr>
<td>Age</td>
<td>0.216*</td>
<td>0.190</td>
<td>0.232*</td>
<td>0.206</td>
</tr>
<tr>
<td></td>
<td>(0.124)</td>
<td>(0.154)</td>
<td>(0.122)</td>
<td>(0.154)</td>
</tr>
<tr>
<td>Age Sq.</td>
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<td>-0.00592</td>
<td>-0.00712**</td>
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<tr>
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<td>(0.00348)</td>
<td>(0.00448)</td>
<td>(0.00343)</td>
<td>(0.00448)</td>
</tr>
</tbody>
</table>

Fixed Effects¹: Yes, Yes, Yes, Yes  
Caste²: No, No, No, No  
Control³: No, No, No, No  
Observations: 310, 298, 303, 291

Standard errors in parentheses  
*** p<0.01, ** p<0.05, * p<0.1
<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Model 3</th>
<th>(2) Remove Older Outliers</th>
<th>(3) Remove DBETA &gt;0.6</th>
<th>(4) Remove DBETA &gt;0.6 &amp; Older Outliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Cultural Environ.</td>
<td>0.0442* (0.0235)</td>
<td>0.0445* (0.0245)</td>
<td>0.0421* (0.0232)</td>
<td>0.0422* (0.0243)</td>
</tr>
<tr>
<td>Family Cultural Environ.</td>
<td>0.0405 (0.0252)</td>
<td>0.0416 (0.0262)</td>
<td>0.0334 (0.0252)</td>
<td>0.0342 (0.0261)</td>
</tr>
<tr>
<td>School Support Environ.</td>
<td>-0.0845*** (0.0308)</td>
<td>-0.0872*** (0.0322)</td>
<td>-0.0972*** (0.0312)</td>
<td>-0.100*** (0.0326)</td>
</tr>
<tr>
<td>Age</td>
<td>0.214* (0.117)</td>
<td>0.189 (0.145)</td>
<td>0.229** (0.115)</td>
<td>0.202 (0.145)</td>
</tr>
<tr>
<td>Age Sq.</td>
<td>-0.00679** (0.214*)</td>
<td>-0.00602 (0.189)</td>
<td>-0.00713** (0.229*)</td>
<td>-0.00630 (0.00419)</td>
</tr>
</tbody>
</table>

Fixed Effects¹: Yes, Yes, Yes, Yes

Caste²: Yes, Yes, Yes, Yes

Control³: No, No, No, No

Observations: 310, 298, 304, 292

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1
Discussion/Conclusion
Marginal effects of school environment are double the magnitude of those for culture

- Culture/taboos hard to change, but School may be a good source to implement policy changes
- Need to consider synergistic role of education & infrastructure (Garg et al, 2012; Dolan, 2014)
- Need to consider role of men, as they often hold the keys to get things done (Fishman, 2014)
- Younger people are “change makers” (Snel & Shordt, 2005)

Limitations

- Self-reported answers (but model based on perceptions)
- Have not evaluated extensions to model including coping styles, optimism, “info, seekers vs. blunters”
- Heterogeneity of Sample (still face a bimodality issue not completely accounted for with FEs or Caste)
- Do not account for stage of menstrual cycle & hormonal fluctuations (Jang & Elfenbein, 2018; Brock et al, 2016)
Conclusions

- There is a call in MHM research to bring quantitative work & address gaps in coverage of emotional consequences
  - We used primary data from 3 schools in different regions of Western Nepal
  - Focused on emotional wellbeing using the Transactional Model of Stress and Coping as a conceptual framework
  - Performed empirical analysis, getting results robust to multiple specifications

- Results show that the cultural environment Nepalese girls perceive increases their probability of feeling lonely/sad during menstruation, while the perceived presence of school infrastructure to support menstrual hygiene reduces these feelings

- “Two-steps forward with one-step back” – aim policies at schools & improving infrastructure
Thank You!!

Source: https://www.daysforgirls.org/dfg-kits