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Just World Beliefs as a Predictor of Pregnancy Loss Beliefs in the United States: A National Survey

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Abstract: Just World Beliefs are a tendency to believe the world is inherently fair. The strength of these beliefs correlates with victim derogation, including blaming victims of medical pathology. This cross-sectional study aimed to evaluate whether the strength of belief in a just world predicts beliefs about the etiologies of early pregnancy loss. In total, 911 adults living in the United States were recruited using Amazon Mechanical Turk. Participants completed a web-based assessment of their views on causes of pregnancy loss and a validated measure of just world beliefs. Pearson's chi-squared test was used to evaluate the association between just world belief strength and beliefs about internal and external causes of spontaneous pregnancy loss. Compared to participants with weak just world beliefs, respondents with strong just world beliefs were more likely to attribute a pregnancy loss to benign reproductive choices (contraception use or a prior abortion) and daily activities (prolonged standing, engaging in an argument) that are within an individual's control, while minimizing the contribution of factors that cannot be controlled (fetal genetic abnormalities). Understanding belief systems contributing to miscarriage stigma may help to develop stigma-reducing interventions for both patients and the general public.

Keywords: spontaneous abortion; social psychology; pregnancy outcome

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1. Introduction

The Just World Belief (JWB) theory suggests we live in a fair world in which people face the outcome they deserve. In this view, bad people experience unfavorable outcomes and good people experience positive outcomes [1]. These beliefs help people feel in control of their own fate which has significant psychological benefits, but these beliefs are also associated with victim derogation [1,2]. People with strong JWBs are more likely to blame victims of sexual assault and express more disease-related stigma [2,3].

Ten percent of clinically recognized pregnancies result in early pregnancy loss (EPL), with 80% occurring in the first trimester [4]. Despite the prevalence of EPL and its often-unknown etiology, stigmatizing views of EPL remain common. Among individuals experiencing EPL, 47% felt guilt and 38% believed their EPL was preventable [5]. This damaging perspective has social and emotional consequences for individuals and families experiencing spontaneous EPL [6].

One prior publication assessed the role of JWBs and miscarriage knowledge [7]. This 2018 study found a correlation between JWBs and misperceptions about miscarriage among participants exposed to various fictional vignettes about a woman experiencing a pregnancy loss [7]. However, 76% of the participants in this study were undergraduate students at a single state university in the Southeastern United States, which may limit the generalizability of these results [7].

The current study aimed to assess the relationship between JWBs and beliefs concerning the causes of EPL in a sample of adults in the U.S. We hypothesized that individuals

with strong JWBs would be more likely to attribute early pregnancy loss to controllable life choices, such as reproductive decisions and benign daily activities, compared to individuals with weaker JWBs.

2. Materials and Methods

The Human Studies Program at the University of Hawaii determined this cross-sectional study to be exempt from full review on 20 March 2020 (Protocol #2020-0015). The STROBE Equator checklist was used to design and report the findings of this study [8]. From December 2020 to June 2021, an online recruitment platform (Amazon Mechanical Turk) was used to recruit a convenience sample of adults (ages 18 years and older) in the United States (all states and territories). This platform allows users to select tasks such as research studies to complete in exchange for monetary compensation [9]. Interested Mechanical Turk users completed an online consent form and completed a web-based survey in RedCap [10,11]. Each participant was compensated $5 at the completion of the survey through Mechanical Turk. This survey did not collect contact information or names. Participants were compensated through the Mechanical Turk platform. The authors had no further contact with survey participants after the survey was submitted.

2.1. Survey Tools

The web-based survey included the following four sections: (1) demographics, (2) a scale of JWBs, (3) a scale of abortion stigma, and (4) assessment of beliefs concerning EPL etiologies. Data concerning JWB as a predictor of the abortion stigma scale were previously published [12]. To measure the JWBs, the Global Beliefs in a Just World Scale (GBJWS) was utilized with permission from the original author, Dr. Isaac Lipkus. This previously validated scale included seven prompts, such as "I feel that people get what they deserve" [13]. Respondents then selected their level of agreement on a 6-point scale, yielding a total score of 7 to 42, with higher scores indicating stronger JWBs. This scale was chosen due to its brevity, widespread use, reliability, and well-established validity [1].

To assess beliefs about the underlying etiologies of EPL, we adapted survey items from a previously published survey on EPL knowledge by Bardos et al. [5]. The items were used with permission from the first author, Dr. Jonah Bardos. In Bardos et al.'s 2015 study, participants were presented with 16 possible causes of EPL and asked respondents whether each item could cause a miscarriage [5]. The current study uses the same prompt but presented only 9 possible causes of EPL to reduce the overall length of the survey.

2.2. Exclusion Criteria

The survey included three attention check questions, which included obvious answers. For example, one survey prompt instructed participants to select "strongly disagree", and another instructed the participants to choose "pizza" from a list of multiple food options. Participants who provided an incorrect response to one or more of these questions were excluded from the study due to concerns that the respondent did not read the question prompts. This practice of excluding participants who incorrectly answer attention checks has been utilized in previously published studies involving online surveys [5]. When Mechanical Turk users submitted duplicate submissions from a single account, only the first submission was included, and all subsequent submissions were excluded from the data analysis.

2.3. Data Analysis

Because this study oversampled the residents of Hawaii, the responses were weighted based on self-reported state of residence and the state population [14]. For the analysis, individuals were separated based on JWB score quartiles. In SPSS v28, we used Pearson's chi-squared test to compare EPL beliefs between the respondents with weak (less than the mean) versus strong (greater than the mean) JWBs.

3. Results

3.1. Sample Description

This study received 1039 survey responses. After excluding duplicate submissions (48 responses), responses with incorrect attention check answers (71 responses), and responses in which the participant abandoned the survey within the first half of the demographics section (9 responses), 911 responses were analyzed for this study. Detailed demographic characteristics of this sample have been previously published [12]. Study participants reported living in 48 different states plus the District of Columbia. No residents of New Hampshire or South Dakota completed the survey. In the weighted sample, most respondents were male (54%). The mean age was 39 years, with ages ranging from 18 to 76 years. The majority of respondents were Caucasian/White race (75.6%) or African American/Black race (12.9%). Twenty-eight percent of respondents reported no religion. Among the participants who identified as religious, Christianity was the most commonly chosen religion (62.2%).

3.2. Early Pregnancy Loss Beliefs

The majority (87.7%) of respondents correctly identified the most common cause of EPL, a genetic abnormality of the fetus. A significant portion of participants incorrectly attributed EPL to a previous abortion (54.6%), past use of an intrauterine device (50.7%), and past use of birth control pills (42.6%). Beliefs that common daily activities caused EPL were also prevalent in our sample. These activities included standing for more than 3 h per day (27.9%), climbing more than three flights of stairs per day (30.3%), arguing with someone (35.2%), lifting heavy objects (67.6%), or a stressful life event (79.7%).

The prevalence of these beliefs varied significantly between individuals with weak and strong JWBs (see Figure 1). When compared to those with weak JWBs, people with strong JWBs were more likely to attribute EPL to a previous abortion ($p < 0.01$), prior intrauterine device use ($p < 0.01$), prior birth control pill use ($p < 0.01$), prolonged standing ($p < 0.01$), climbing stairs ($p < 0.01$), and arguing with someone ($p < 0.01$). Respondents with strong JWBs were also less likely to identify fetal genetic abnormalities as a cause of EPL ($p < 0.01$). There was no difference between groups in prevalence of the belief that stressful life events can cause EPL.

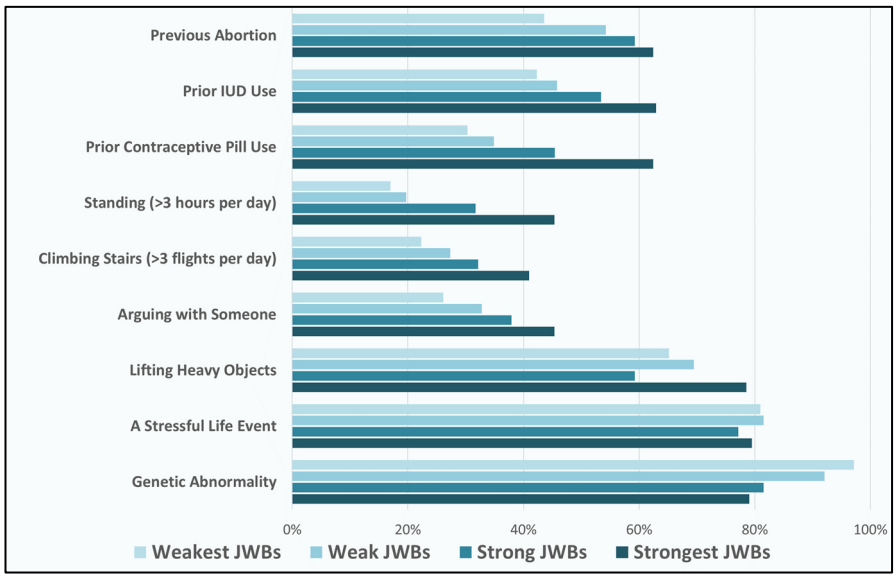

Figure 1. Perceived Causes of EPL among Respondents with Weak versus Strong JWBS ($n = 911$).

4. Discussion

This study explored the association between JWBs and beliefs about the causes of EPL. Half of the respondents felt that reproductive choices could cause EPL, despite a lack of

evidence to support this association [15]. These results are consistent with a previous study on miscarriage beliefs in the United States, in which respondents commonly agreed or were unsure whether contraceptive methods and abortion could cause a miscarriage [5]. These views may be harmful given the high prevalence of both contraception use and abortion. Among US women, 25% will have an abortion in their lifetime and 44% use either pills or an intrauterine device for contraception [16,17]. Believing or having friends and family who believe these common reproductive choices cause EPL may contribute to the distress and blame experienced by individuals after an EPL.

Study respondents also commonly attributed EPL to benign daily activities, such as prolonged standing or arguing with someone. One in four respondents believed standing for more than 3 h per day could cause EPL. This finding suggests that many people believe pregnant people must be physically sedentary to avoid increasing their risk of EPL, despite the known benefits of exercise in pregnancy [18]. Minimizing standing to less than 3 h per day would be extremely challenging, especially for individuals with jobs or children. This misconception that routine physical activity causes adverse pregnancy outcomes may contribute to beliefs that pregnant individuals who maintain an active lifestyle or continue to work in early pregnancy are doing so at the expense of the fetus.

Although misinformation about EPL etiologies was common throughout our sample, respondents with strong JWBs were significantly more likely to incorrectly attribute EPL to benign reproductive choices and daily activities. Compared to respondents with weak JWBs, those with strong JWBs were also less likely to recognize the most common cause of EPL (genetic abnormality), a factor that is outside of an individual's control. These findings are consistent with the JWB theory. JWBs can be protective, helping individuals gain a sense of control over their current and future outcomes. People with strong JWBs are more satisfied with life and experience less stress than those with weak JWBs [19,20]. For this reason, people with strong JWBs may be highly motivated to seek out and adopt beliefs that reinforce their perception that the world is just in order to maintain this sense of control. Attributing EPL to modifiable risk factors, such as contraception choice and prolonged standing, while minimizing factors outside of their control, such as fetal genetics, may help this population avoid threats to their belief system and psychological wellbeing.

Major limitations of this study include possible selection bias and the reliance on self-reported demographic data. However, previous studies suggest that Mechanical Turk data are at least equivalent in quality to that of data collected using more traditional recruitment methods [21,22]. Although this study disproportionally sampled participants living in Hawaii (10% of the unweighted data), this distribution was corrected by applying weights to the data based on the population of each state to create a nationally representative sample for analysis. Strengths of this study include the use of a national sample and validated scales, as well as our multi-disciplinary approach to understanding views on EPL. These strengths support the generalizability of our findings.

5. Conclusions

This study identifies a belief system that correlates with the tendency to attribute pregnancy loss to controllable choices while underestimating the impact of uncontrollable factors (such as genetic abnormalities). Misconceptions concerning EPL can result in significant stigma and distress [6]. Commonly suggested strategies for reducing EPL-related stigma include increasing awareness of miscarriage prevalence and the vital role of in-person and online social support [23,24]. However, these interventions remain untested and logistically challenging for clinicians to implement in practice. Understanding the belief systems contributing to harmful EPL stigma is a vital first step in conceptualizing and developing stigma-reducing interventions for both the person experiencing pregnancy loss and the general public.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The de-identified data presented in this study are available on request from the corresponding author.

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