Internalized Stigma and Stigma-Related Isolation Predict Women’s Psychological Distress and Physical Health Symptoms Post-Abortion

Author Note

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Abstract

Researchers have provided evidence that accessing abortion relates to anticipated, experienced, and internalized stigma. These aspects of stigma have previously been associated with increased psychological distress and physical health symptoms. However, there has been no research on how anticipation, perception, internalization, and stigma-related isolation are related to psychological distress and somatic (physical) symptoms. We examined this question in an online volunteer sample of women in Ireland (N = 155) who have had an abortion. Internalized stigma and stigma-related isolation significantly predicted higher levels of psychological distress, and internalized stigma also significantly predicted somatic symptoms. The direct effect of each type of stigma on somatic symptoms was mediated by psychological distress. Thus, to the extent that women had internalized greater stigma and isolated themselves, they also reported increased psychological distress, and this psychological distress predicted increased somatic symptoms. The relation between internalized stigma and somatic symptoms was also moderated by stigma-related isolation. Our findings complement and extend the existing literature on the relations between stigmatized identities, psychological distress, and physical health problems, particularly regarding women who have accessed abortion. They also indicate that those involved in policy-making and activism around reproductive rights should avoid inadvertently increasing the stigma surrounding abortion.

Keywords: stigma, abortion (attitudes towards), distress, physical health, somatization
Internalized Stigma and Stigma-Related Isolation Predict Women’s Psychological Distress and Physical Health Symptoms Post-Abortion

Unwanted pregnancy happens: Around the world, 41% of all pregnancies are unplanned (Singh, Sedgh, & Hussain, 2010). Although some of these pregnancies are voluntarily continued, in other cases people want and need to access abortion services. Indeed, abortion is one of the most common gynecological procedures, experienced by 81 women around the world every minute (Kumar, Hessini, & Mitchell, 2009). Despite the prevalence of abortion, it is sometimes assumed that accessing abortion negatively affects women’s well-being, as evidenced by the creation of a supposed “post-abortion syndrome” (PAS), based on the criteria for post-traumatic stress disorder (Reardon, 1987). Hopkins, Reicher, and Saleem (1996), however, claim this supposed syndrome was identified by those with an anti-abortion agenda, and argue that it is used to restrict abortion access (see also Beynon-Jones, 2017). In line with this, evidence demonstrates no consistent effect of abortion on women’s well-being (American Psychological Association, 2008; Hanschmidt, Linde, Hilbert, Riedel-Heller, & Kersting, 2016; Major, Appelbaum, Beckman, Dutton, Russo, & West, 2009; Rubin & Russo, 2004).

The empirical literature suggests that it is the stigmatization of abortion that may lead women to experience diminished well-being. One identifiable consequence of abortion is that the person who accesses it gains a socially constructed stigmatized identity (Beynon-Jones, 2017; Kumar et al., 2009). In the current study, we investigated the link between stigma attached to having an abortion and psychological and physical well-being in a setting where abortion is particularly controversial—because it is illegal. Ireland is one of only two countries in Europe where abortion is legal only when it is judged as necessary to save the life of the mother (Center for Reproductive Rights, 2017). In such a setting, we argue, abortion may be considered even more stigmatizing than in places where it is legally available.
According to the now seminal definition by Goffman (1963), stigma is the social devaluation of a person or group on the basis of some characteristic. Building on this definition, Link and Phelan (2006) note that to stigmatize someone is to label them as different, to associate them with a negative stereotype on the basis of this difference, and to discriminate against them. Although considerable research has focused on the effects of visible stigma such as race, gender (Pascoe & Smart Richman, 2009), and obesity (Puhl & Heuer, 2009), there is also a burgeoning literature on stigmatized identities that are not necessarily visible (e.g., Greenwood, Adshead, & Jay, 2017). Concealable stigmatized identities (CSIs) exert significant negative effects on people’s daily lives (Pachankis, 2007). In many cases, the literature on CSIs relates to chronic ongoing illnesses or conditions such as HIV/AIDS, rather than a singular event such as abortion (Cockrill & Nack, 2013). Nonetheless, we argue that abortion is also a basis on which women are stigmatized and by which they gain an unwanted stigmatized identity, particularly given that abortion is a choice and “controllable” stigmas are generally associated with significant blame and prejudice (Hegarty & Golden, 2008). According to Kumar and colleagues (2009, p. 628), abortion stigma may be defined as “a negative attribute ascribed to women who seek to terminate a pregnancy that marks them, internally or externally, as inferior to ideals of womanhood.”

When a woman has an abortion she not only takes on the associated stigma but is also categorized together with other women who have done the same. There is evidence to support the notion of a stigmatized abortion identity. First, there is evidence that women who have had an abortion are stigmatized by others. This is shown in classic experimental findings (Weidner & Griffitt, 1984), but also in more recent qualitative research (Gelman, Rosenfeld, Nikolajski, Freedman, Steinberg, & Borrero, 2017) and a meta-analysis of the field (Hanschmidt et al., 2016). Moreover, evidence suggests women who have had abortions are aware of this stigma and it is something that they anticipate (Cockrill, Upadhyay, Turan, & Greene Foster, 2013; Gelman et al.,

This is particularly noteworthy because it is known that stigmatization has clear consequences for psychological well-being. Studies relating to HIV/AIDS, other chronic physical illnesses, mental illnesses, and other CSIs demonstrate that internalized, experienced, and anticipated stigma is related to reduced self-esteem (Corrigan, Watson, & Barr, 2006; Link & Phelan, 2006), reduced quality of life (Earnshaw & Quinn, 2011; Earnshaw, Quinn & Park, 2011) and, most frequently, to psychological distress (Audet, McGowan, Wallston, & Kipp, 2013; Chaudoir & Quinn, 2016; Cluver, Gardner, & Operario, 2008; Hatzenbuehler, Nolen-Hoeksema & Dovidio, 2009; Kapella, Berger, Vern, Vispute, Prasad, & Carley, 2015; Link & Phelan, 2006; Markowitz, 1998; Meyer, 2003; Miller, Solomon, Varni, Hodge, Knapp, & Bunn, 2016; Pérez-Garín, Molero, & Bos, 2015; Quinn & Chaudoir, 2009; Quinn et al., 2014; Simbayi, Kalichman, Strebel, Cloete, Henda, & Mqeketo, 2007; Slade, O'Neill, Simpson, & Lashen, 2007). Furthermore, the negative effects of stigmatization extend beyond the psychological, to physical health, such as symptoms of illness (e.g., coughing, nausea, chest pain; Quinn & Chaudoir, 2009); increased somatic symptoms in the unemployed (e.g., headache, insomnia, stomach upsets; O’Donnell, Corrigan, & Gallagher, 2015); and in individuals with HIV/AIDS, reduced physical well-being (Miller et al., 2016), and chronic illness comorbidity and low CD4 count (Earnshaw, Smith, Chaudoir, Amico, & Copenhaver, 2013), which indicates poor immune functioning. There is also a considerable body of work on homonegativity (internalized homophobia), which demonstrates that higher levels of homonegativity are related to increased physical symptom severity (e.g., Denton, Rostosky, & Danner, 2014).

The relation between abortion stigma and both psychological distress and physical health symptoms is therefore worthy of investigation; existing research also suggests a mediating role for psychological distress in the relation between stigmatization and physical health symptoms (Miller et al., 2016; O’Donnell et al., 2015). To date, there is some evidence of the impact of abortion stigma
on well-being. For example, qualitative research has linked perceived and internalized abortion stigma to psychological distress (Gelman et al., 2017); a meta-analysis related secrecy around abortion to psychological distress (Hanschmidt et al., 2016); and a longitudinal study demonstrated the effect of anticipated stigma on psychological distress via secrecy and non-disclosure around abortion (Major & Gramzow, 1999). In the current study, we aimed to advance existing knowledge by investigating the link between abortion stigma and psychological distress and symptoms of poor physical health.

Studies such as the one by Major and Gramzow (1999), although extremely informative, have primarily used single-item measures of abortion stigma, despite the fact that research on stigma more generally shows it to be multifaceted. For example, Earnshaw and colleagues’ (2013) study on HIV stigma demonstrated the relative contribution of internalized, experienced, and anticipated stigma to health and well-being outcomes. Although there has been a recent call for additional research in the area of abortion stigma and well-being, including a call for validated measures (Hanschmidt et al., 2016), as of yet no one has shown how different aspects of stigma are related to psychological distress and physical health symptoms in this particular group. In the current study, we address this specific gap.

**Stigma Nomenclature**

Within the literature on stigmatization and its effects, the general concept of stigma has been broken down into several aspects. For example, Herek’s (2009) framework of the manifestations of sexual stigma includes *internalized stigma* (acceptance of the culturally held view), *felt stigma* (encompassing perceptions and expectations of stigmatization), and what they term *enacted stigma* (actual experiences of stigmatization). Cockrill and Nack (2013) have applied this particular framework to abortion stigma. However, similar frameworks have been applied to many stigmatized identities, although the terminology sometimes differs. For example, internalized stigma is also
called *self-stigma* (e.g., Corrigan et al., 2006). And, while some researchers use the term felt stigma, this is quite a broad concept which is broken down into more precise concepts elsewhere; for example *anticipated stigma* (e.g., Quinn & Chaudoir, 2009), which measures the belief that others would stigmatize you if they found out about your stigmatized identity, and *perceived stigma* (Audet et al., 2013), which refers to the perception that there is stigma in the world related to this identity. Finally, enacted stigma is also referred to as *experienced stigma* (e.g., Earnshaw & Quinn, 2011) or as *discrimination*. In the current paper, we use Cockrill and colleagues’ conceptualization (Cockrill & Nack, 2013; Cockrill et al., 2013) but adopt the terms experienced, anticipated, perceived, and internalized stigma, to fit with the literature on stigmatized identities more generally.

Cockrill and colleagues (2013) incorporated the concept of *isolation* as a facet of abortion stigma. In the current study, we call this *stigma-related isolation*, and it refers to the person’s perception that they cannot let others know about their abortion because it is too stigmatizing, which limits social support. The concept of isolation is not commonly included within a definition of stigma, but related variables in the stigmatization literature are *disclosure* and *secrecy*, which have been investigated in relation to both abortion stigma (Astbury-Ward et al., 2012; Beynon-Jones, 2017; Cockrill & Nack, 2013) and other types of CSI (Quinn & Earnshaw, 2011; Chaudoir & Quinn, 2010). Indeed, stigmatization has been related to concealment or delaying of abortion (Gelman et al., 2017), and concealment or secrecy has been linked to feelings of isolation (Cockrill & Nack, 2013; Cockrill et al., 2013; Hanschmidt et al., 2016; Major & Gramzow, 1999). Overall, there is extensive evidence that concepts such as disclosure, secrecy, and isolation are important in the link between stigmatized identities and health outcomes (e.g., Audet et al., 2013; Barned, Stinzi, Mack, & O’Doherty, 2016; Bor, Miller, & Goldman, 1993; Chaudoir & Quinn, 2010; Gilbert & Walker, 2010; Miller, Canales, Amacker, Backstrom, & Gidycz, 2011; Nachega et al., 2012; Pachankis, 2007; Slade et al., 2007).
Stigma-related isolation may also be seen as relating to social support, which is relevant to both stigma (Earnshaw et al., 2011; Hatzenbuehler et al., 2009) and abortion (Major, Cozzarelli, Sciacchitano, Cooper, Testa, & Mueller, 1990). Given that stigma is known to act as a stressor (Hatzenbuehler et al., 2009), it may be that stigma-related isolation moderates the impact of other stigma aspects on health outcomes, in line with the stress-buffering hypothesis (Cohen & Wills, 1985); social support has been shown to buffer the impact of stressors on psychological well-being (e.g., Lindsey, Joe, & Nebbitt, 2010) and physical health (Cantwell, Muldoon, & Gallagher, 2014). Our study investigated the potential for stigma-related isolation to fulfil a similar moderating role between other aspects of stigma and health outcomes.

The Present Study

Stigma-related isolation was particularly relevant for this study given that, as noted earlier, we conducted our study in the Republic of Ireland where at the time of data collection, abortion—at any time in a pregnancy—was illegal, as outlawed in the constitution, except in cases where the pregnant woman’s life is at risk (Center for Reproductive Rights, 2017). It is estimated that between 2001 and 2008, 18 Irish women a day travelled to the UK for abortion services, and the furtive nature of such journeys is argued to make subsequent concealment even more likely (Gilmartin & White, 2011).

In the present study, we investigated the contribution of each aspect of stigma (as proposed by Cockrill et al., 2013) in predicting psychological distress and physical health symptoms. We conceptualized abortion stigma as anticipated stigma, perceived stigma, internalized stigma, and stigma-related isolation, as outlined above, and measured them using the Individual Level Abortion Scale (ILAS; Cockrill et al., 2013). Psychological distress was measured using the Hospital Anxiety and Depression scale (HADS; Zigmond & Snaith, 1983), allowing us to create a composite measure of depression and anxiety, which is commonly used as an indicator of poor psychological well-being.
in the literature on stigmatized identities (e.g., Miller et al., 2016; Pérez-Garín et al., 2015; Quinn et al., 2014; Slade et al., 2007). Finally, we measured physical health symptoms using the Physical Health Questionnaire (PHQ; Schat, Kelloway, & Desmarais, 2005), a self-report measure of somatic symptoms. The PHQ is a frequently-used index of physical health complaints (e.g., Springer, Sheridan, Kuo & Carnes, 2007) and has previously been used in studies on stigmatization (O’Donnell et al., 2015).

We predicted that increased levels of abortion stigma would be associated with increased psychological distress and somatic symptoms. We also tested the predictive relation of each stigma subscale, to see which aspects of abortion stigma best predict each well-being outcome. Further, we investigated whether the direct effect of the four aspects of abortion stigma (anticipated, perceived, internalized, and isolation-related) on somatic symptoms would be mediated by psychological distress. Finally, we tested whether stigma-related isolation moderates the impact of other aspects of stigma on psychological distress and somatic symptoms.

**Method**

**Participants**

The total number of people who accessed this study online was 1,930. Of these, 652 people clicked “continue” to start the survey. However, 366 people exited without typing in any responses at all. We believe the high click-rate for the survey by people who did not go on to ultimately take part was caused by the topic. Abortion is widely discussed in Ireland, and this was especially the case at the time of data collection, which was February 2017. Three months previous to this, the Taoiseach (Irish Prime Minister) had promised, if reelected in 2017, to hold a Citizens Assembly to debate the removal of the 8th Amendment from the Constitution, which outlaws abortion except where the woman’s life is at risk (RTÉ News, 2016).
The first questions of the survey asked participants their current age, and age at the time of their last abortion. While 286 people entered a current age, 86 of these then indicated that they had not actually had an abortion by writing into the next field comments such as “never” or “haven’t had one.” None of these participants continued beyond this point. This left 200 participants who completed all demographic items, of whom, 25 did not complete any items after this point. An additional 19 participants dropped out partway through the survey itself; that is, while taking the measures of interest. After all the dropouts were taken into account, in total, 156 participants completed the survey from start to finish, but one of these was excluded reporting their age under the criteria of 18 years. When we compared the final sample to those who started the measures of interest and then dropped out, there were no significant differences in current age, age at the time of abortion, or any of the stigma measures, which all participants completed (all ps > .05).

In the final sample of 155 participants, ages ranged from 18 to 68 years ($M = 32.34$, $SD = 10.09$). The mean age at which participants had had an abortion was at 23.67 years ($SD = 5.95$), ranging from 15 to 41 years of age, and the time since the last abortion ranged from within the previous 12 months to 47 years ago ($M = 8.67$ years, $SD = 9.18$; NB we did not ask how many abortions participants had). Participants were not required to be Irish citizens, nor currently resident in Ireland, but they must have been resident in Ireland at the time of their abortion, as we reasoned that the need to travel for an abortion is likely to affect feelings of stigmatization. The majority of participants were Irish (85.8%, $n = 133$), with the next largest group being other European nationalities (7.7%, $n = 12$), followed by American (3.9%, $n = 6$), and Other (2.6%, $n = 4$). Most participants (54.2%, $n = 84$) reported being either Catholic or another Christian religion, while 39.4% ($n = 61$) reported being non-religious and 6.5% ($n = 10$) classified themselves as having another religion. Participation in the study was voluntary, with no incentive offered.

Of this final sample of participants, 15 people had either one or two missing values. Analysis of potential patterns in the missing data showed that less than .17% of all items for all cases were
missing, and 78.43% of the items were not missing data for any case. Considering individual cases, 93.55% of participants had no missing data. Finally, no item had more than 1.3% of missing values. Based on advice from Bell, Fairclough, Fiero, and Butow (2016), missing values were replaced with the participant’s mean score for the relevant scale. This method was chosen as Bell and colleagues advised it is superior to complete case analysis.

Design

We used a cross-sectional, correlational design. The predictor variables for this study were anticipated, perceived, and internalized stigma, and stigma-related isolation, and the outcome variables were psychological distress (anxiety, depression) and somatic symptoms. Psychological distress was also used as a mediating variable, and stigma-related isolation as a moderator. Nationality, religion, and time since last abortion were controlled for in our analyses, as it has been claimed that abortion is more stigmatizing to women from certain cultures and/or religions (Bommaraju et al., 2016), and that it may become less stigmatizing over time (Cockrill & Nack, 2013).

Materials and Procedure

Ethical approval was obtained from our university’s Research Ethics Committee. Due to the sensitive nature of the study, data were collected online. We recruited both via email, sent to staff and students at a university in the Republic of Ireland, and via advertisements on Twitter and Facebook. This broad recruitment meant that many people clicked on the survey link but did not complete it, as noted above. However, we felt that in order to ensure the sample obtained was appropriate to address our research questions, it was important to make recruitment as open as possible. The recruitment materials presented the study as “a study examining the experiences of women who have had an abortion.” Further, they stated that participants would not be asked about the abortion itself; rather, the questions would focus on their perceptions of how others view
abortion, and their own psychological and physical well-being. The online survey was created using Questback software, and participants indicated informed consent by clicking a button to continue to the survey. Participants completed the measures as outlined below. We intentionally presented measures in this order in order to emphasize the face validity of the study: We wanted participants to see that as we had stated, the survey focused first on their perceptions of how others view abortion, and latterly about their own psychological and physical well-being. This was important because of the sensitive topic of the study, and our desire to retain as many participants as possible. Finally, upon completion of the survey, participants were shown a debriefing page, where links to relevant support providers were included.

Measures

Participants first completed demographic questions including age, age at the time of abortion, religion and nationality. Using the former two variables, a new “time since abortion” variable was computed for inclusion in our analyses. For religion, because very few participants chose a religion other than Catholic or Christian, responses were categorized to facilitate analysis (0 = Religious [Catholic/Christian/Other Religion], 1 = Non-Religious). For nationality, three dummy variables were created whereby the most frequently represented category, Irish, was compared with European, American, and Other groups respectively. In each of these dummy variables, the category of interest was coded as one (with Irish always coded as zero).

Participants then completed measures of our variables of interest: abortion stigma, psychological distress, and somatic symptoms (i.e., physical health symptoms). These scales were chosen for their suitability to the research question and their previous use and reliability as outlined below. In the case of our stigma measures, all originated as subscales of the Individual Level Abortion Stigma Scale (ILAS; Cockrill et al., 2013). Cockrill and colleagues advise that the measure should be treated as multidimensional, with all subscales correlating highly with the total scale but
not with one another. They verified the factor structure and subscale reliability based on a sample of women who had had abortions, recruited from family planning clinics in six US states. Their factor analysis facilitated the creation of the current four-factor structure, and they demonstrated construct validity by evidencing a strong link between each subscale and the related concept of secrecy. In the current analysis, we used each of the four subscales to assess the predictive utility of each, in line with our stated aim to determine which aspect(s) best predict psychological distress and somatic symptoms. Responses to relevant items were averaged to form each ILAS subscale, as advised by the authors (Cockrill et al., 2013).

**Anticipated stigma.** Cockrill and colleagues’ (2013) “worries about judgment” subscale was used to measure anticipated stigma. It includes seven items that assess participants’ worries about judgment from loved ones at the time of their abortion (e.g., “I would disappoint someone I love”) and was measured on a four-point scale (0 = *Not at all worried* to 3 = *Extremely worried*). Higher scores meant higher worries about judgment. The scale was highly internally reliable for the current sample (\(\alpha = .91\)), which is consistent with past research (\(\alpha = .94\); Cockrill et al., 2013).

**Perceived stigma.** In Cockrill and colleagues’ (2013) conceptualization, this subscale was termed “community condemnation.” It assesses perceived negative views of abortion from the broader community around the time of their abortion (e.g., how many people would agree with the statement “Abortion is always wrong”), and comprised two items measured on a five-point scale (0 = *No one* to 5 = *Most people*), with higher scores indicating more condemnation. Cockrill and colleagues (2013) report this subscale as having very good reliability (\(\alpha = .78\)). This scale was also very reliable for the current sample \(r = .84, p < .001\).

**Internalized stigma.** Eight items were used to measure the extent of participants’ negative views of themselves related to the abortion at the time of the abortion (e.g., “I felt like a bad person”). This subscale is termed “self-judgment” by Cockrill and colleagues (2013). All items were
measured on a five-point scale (0 = *Strongly disagree* to 4 = *Strongly agree*). Three items were positively worded and so reverse scored, such that a higher score meant more internalized stigma.

The scale had strong internal reliability with the current sample (α = .86), in line with the finding of Cockrill and colleagues (α = .84).

**Stigma-related isolation.** This subscale measured the extent to which participants felt that abortion stigma prevented them from reaching out to and feeling support from those close to them. As in Cockrill and colleagues’ (2013) version (where it was simply called “isolation”), all six items were worded positively, relating to the extent to which women spoke to and received support from loved ones concerning their abortion (e.g., “I have had a conversation with someone I am close with about my abortion”). This subscale did not specify a timeframe. All items were reverse scored, so higher scores indicate higher stigma-related isolation. Items were measured on a four-point scale (0 = *Never* to 3 = *Many times*). In the original scale, three of these items were instead measured on a five-point scale (0 = *Strongly disagree* to 4 = *Strongly agree*). In the current study a minor coding error meant the same four-point scale was used for all items, which slightly affects the possible mean score. The scale has shown high reliability in the past (Cockrill et al., 2013: α = .83) and it was highly internally reliable with the current sample (α = .92).

**Psychological distress.** We measured psychological distress using the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983), as anxiety/depression have commonly been used in the stigmatized identities literature as measures of the psychological impact of stigma (e.g., Major & Gramzow, 1999; O’Donnell et al., 2015; Quinn & Chaudoir, 2009). A review of over 700 studies confirmed the reliability and validity of this measure for use with the general population as well as primary care and psychiatric patients (Bjelland, Dahl, Haug, & Neckelmann, 2002). The HADS is a 14-item scale with responses on a four-point scale ranging from 0-3, with participants indicating how they have been feeling over the last two weeks. Higher scores denoted higher levels of anxiety and depression with 8 items having been reverse scored. Participants’ scores were
summed as instructed by the scale authors. Total scores can range from 0-42, and in this study was used as a continuous measure of psychological distress as in Slade and colleagues (2007), which also used a stigmatized sample. For this sample, the scale demonstrated high internal reliability ($\alpha = .94$), which was consistent with past studies (Bjelland et al., 2002; Slade et al., 2007).

**Somatic symptoms.** Participants’ experience of somatic symptoms over the last year was measured using the Physical Health Questionnaire (PHQ; Schat, Kelloway, & Desmarais, 2005). This 14-item scale measures frequency of various health complaints such as sleep quality, headaches and stomach aches, with responses measured on a 7-point scale (1 = *Not at all* to 7 = *All of the time*). Item 4 was reverse scored as it is worded positively, and thus higher scores indicate more impaired physical well-being. Total scores can range from 14 to 98, with higher scores indicating increased somatic symptoms. This measure was chosen as perceived health status has been shown to be a good indicator of actual health status (Arnold & Dupré, 2012). Moreover, the PHQ specifically has been used to measure somatic symptoms in other distressed samples, and has demonstrated very good reliability in such samples (e.g., $\alpha = .84$; Cantwell et al., 2014). In the present study, participants’ scores were summed to create total scores, which is consistent with previous use of the scale (e.g., Arnold & Dupré, 2012; Schat & Kelloway, 2003), including in studies of stigmatized groups (O’Donnell et al., 2015). For this sample, internal reliability was high ($\alpha = .91$).

**Analytic Strategy**

To test our prediction that increased abortion stigma would be associated with increased psychological distress and somatic symptoms, and to determine the contribution of each aspect of stigma, we conducted two hierarchical linear regression analyses: first with psychological distress as the outcome, and the second with somatic symptoms as the outcome. Hierarchical analyses were used to allow us account for religion, nationality, and time since abortion at Step 1.
Next, to test our prediction that the direct effect of different aspects of abortion stigma on somatic symptoms would be mediated by psychological distress, we conducted bootstrapping analyses (Hayes, 2009). Bootstrapping is the ideal method to test for mediation as it involves taking thousands of samples from the dataset and estimating the indirect effect with each of these resampled datasets. Shapiro-Wilk tests indicated that our variables of interest were not normally distributed, but because of the way it functions, bootstrapping analysis does not require data to be normally distributed (Hayes, 2013). We determined the aspects of stigma that were used as predictor variables here by the hierarchical regression analyses. Finally, to test our prediction that stigma-related isolation would moderate the effects of other aspects of stigma on psychological distress and somatic symptoms, moderated mediation analysis was undertaken, again using bootstrapping. All data analysis was conducted using IBM SPSS 22, and bootstrapping analyses were completed using PROCESS for SPSS by Andrew Hayes (2013).

Because multiple predictors were used in our models, we screened for multicollinearity of predictors, using tolerance statistics and the variation inflation factor (VIF). According to O’Brien (2007), tolerance statistics < .20 and VIF ≥ 5 are problematic. In the current study, the tolerance statistics ranged from .59 to .98, and VIF from 1.02 to 1.69, indicating no problems with multicollinearity.

**Results**

**Descriptive Statistics**

Table 1 presents the means, standard deviations, and correlations between each aspect of stigma, psychological distress and somatic symptoms. It also includes data relating to religion, nationality, and time since abortion, to assess any relation these may have to our variables of interest. We compared mean levels for each variable of interest to those in relevant literature. Compared to levels reported by Cockrill and colleagues (2013), our mean values for anticipated stigma and
stigma-related isolation were very similar. Perceived stigma appeared higher in our sample (2.39 compared to 1.85) and internalized stigma was lower (1.54 compared to 2.00). Two one-sample \( t \)-tests showed neither of these differences to be significant (both \( ps = .08 \)). Mild levels of psychological distress were observed (Zigmond & Snaith, 1983). The PHQ does not include cut-off points, but the current mean level is slightly under the midpoint of 49, so could be considered mild-moderate. Levels of both psychological distress and somatic symptoms are similar to other research on stigmatized groups, albeit slightly lower (e.g., O’Donnell et al., 2015), which might be expected given that other research relates to ongoing conditions, not particular events such as abortion (Cockrill & Nack, 2013).

All abortion stigma subscales, as well as correlating significantly with one another, correlated with psychological distress and somatic symptoms. Psychological distress and somatic symptoms had an extremely strong positive significant relation. Our control variables also showed some significant associations with the variables of interest, especially religion, which correlated with all stigma subscales plus psychological distress, such that those who categorized themselves as religious reported higher stigmatization and psychological distress than those who categorized themselves as non-religious. This is consistent with previous research (Bommaraju et al., 2016).

Hierarchical Linear Regression Analyses

In line with our first hypothesis, two separate hierarchical linear regression analyses were conducted to determine the contribution of each stigma subscale to predicting (1) psychological distress and (2) somatic symptoms. Given previously demonstrated relations with variables of interest, in both cases religion, nationality, and time since abortion were entered at Step 1. As we had no prior prediction about which stigma subscales would explain more variance, all four were entered
together at Step 2. The only difference between the models was that in Model 1, psychological distress was the outcome and in Model 2, somatic symptoms was the outcome.

[INSERT TABLE 2 ABOUT HERE]

**Model 1: Predicting psychological distress.** At Step 1, the model including religion, nationality, and time since abortion did not reach significance in predicting psychological distress, \( F(5, 154) = 2.06, p = .074 \), explaining 7% of the variance in psychological distress. At this step, religion was the only significant predictor of psychological distress (see Table 2). Stigma subscales were entered at Step 2, and the model became statistically significant, \( F(9, 154) = 7.40, p < .001 \), explaining an additional 25% of the variance in psychological distress, which was a statistically significant change. The effect size for the addition of these predictors to the model was large (Cohen’s \( f^2 = .36 \); Cohen, 1988). As seen in Table 2, the only significant predictors in this model were internalized stigma and stigma-related isolation, whereby higher levels of each predicted higher psychological distress. Anticipated stigma and perceived stigma explained no unique variance. Post-hoc power analysis using G*Power showed the power to detect the observed effects at the .001 level was .99.

**Model 2: Predicting somatic symptoms.** At Step 1, the model including religion, nationality, and time since abortion did not predict somatic symptoms, \( F(5, 154) = 1.63, p = .16 \). The only significant predictor of somatic symptoms in this model was one of the nationality dummy variables, which compared Irish and European participants (see Table 2). At Step 2, with the addition of stigma subscales, the model was statistically significant, \( F(9, 154) = 5.86, p < .001 \), explaining an additional 22% of the variance. This was a statistically significant change, and represents a medium to large effect size, \( f^2 = .29 \) (Cohen, 1988). In this model, internalized stigma significantly predicted somatic symptoms, and the effect for stigma-related isolation was not significant, although it was close to conventional levels of significance (\( p = .061 \)). Higher internalized stigma and stigma-related
isolation were associated with increased somatic symptoms, while anticipated stigma and perceived stigma explained no unique variance (see Table 2). Post-hoc power analysis using G*Power showed the power to detect these effects at the .001 level was .99.

**Mediation Analyses**

Next, to test our prediction that psychological distress would mediate the effect of stigma subscales on somatic symptoms, mediation models were calculated using bootstrapping. Using PROCESS model 4 (Hayes, 2013), two separate mediation models were tested. Given that the only significant predictors of psychological distress in the hierarchical regression analyses were internalized stigma and stigma-related isolation, we conducted mediation models where each of these was the predictor \( x \), with psychological distress as the mediator \( m \), and somatic symptoms the outcome \( y \) in each case. Again, religion, nationality and time since abortion were included as covariates. In both models, bootstrapping was conducted by using 5000 bootstrap samples and 95% bias corrected confidence intervals (CIs).

Our first mediation model confirmed that there was a significant direct effect of internalized stigma on somatic symptoms, but that, as predicted, this was rendered non-significant when the effect of psychological distress was also taken into account (see Table 3 for parameter estimates, and Figure 1a for an illustration of the effects). The effect size for the mediation was medium to large \( R^2 = .21 \); Cohen, 1988). Thus, it appears that the association between internalized abortion stigma and somatic symptoms is accounted for by psychological distress.

In line with hierarchical regression Model 2, the next model demonstrated no significant direct effect of stigma-related isolation on somatic symptoms, but this relation is not required when testing mediation through bootstrapping (Hayes, 2009). However, as predicted, there was a significant indirect effect through psychological distress (see Table 3 and Figure 1b). The effect size
for the mediation was medium ($R^2 = .09$; Cohen, 1988). Therefore, there is a positive indirect relation between stigma-related isolation and somatic symptoms that operates through increased psychological distress.

[INSERT FIGURE 1 ABOUT HERE]

**Moderated Mediation Analysis**

Finally, given that stigma-related isolation represents an absence of social support related specifically to abortion, and based on the stress buffering hypothesis, we predicted that stigma-related isolation might moderate the effects of other aspects of stigmatization on both health outcomes. The final model we tested was a moderated mediation analysis, whereby we tested the moderating effect of stigma-related isolation ($w$) on both the direct effect of internalized stigma ($x$) on physical health symptoms ($y$), and the indirect path via psychological distress ($m$). We tested this model using PROCESS model 8. As before, bootstrapping was conducted by using 5000 bootstrap samples and 95% bias corrected confidence intervals (CIs). Variables were mean-centered for this analysis.

The analysis did not show evidence for moderated mediation. However, the direct path between internalized stigma and somatic symptoms was moderated; this path was significant only for those reporting high levels of stigma-related isolation, $b = 3.50, SE = 1.39, 95\%$ CI[0.76, 6.24]; rather than low, $b = -0.45, SE = 1.39, 95\%$ CI[-3.20, 2.31] or medium levels, $b = 1.52, SE = 1.04, 95\%$ CI[-0.54, 3.59]. The interactive effect of internalized stigma and stigma-related isolation on the mediator, psychological distress, while close to conventional levels of significance, was not significant, $b = 1.49, SE = 0.76, p = .051, 95\%$ CI[-0.007, 2.98]. Moreover, the indirect effect of the highest order effect was not significant, $b = 2.02, SE = 1.25, 95\%$ CI[-0.42, 4.54]. Specifically, the indirect path via psychological distress was significant for those reporting low, $b = 3.22, SE = 1.52,$
95% CI[0.33, 6.38]; medium, $b = 5.01$, $SE = 1.03$, 95% CI[3.12, 7.18]; and high levels, $b = 6.81$, $SE = 1.51$, 95% CI[3.95, 9.92] of stigma-related isolation. See Figure 2 for an illustration of the effects.

**Discussion**

We investigated the contribution of several aspects of abortion stigma to psychological distress and somatic symptoms, which had never previously been tested despite the availability of multidimensional measures of abortion stigma. Our study is the first to test whether psychological distress mediates the association between four aspects of stigma and somatic symptoms in women who have had an abortion. Finally, we tested whether these relations would be moderated by one aspect of abortion stigma; stigma-related isolation. To address these questions, we surveyed women who had accessed abortion services while living in the Republic of Ireland, where abortion is illegal and divides opinion quite significantly. The women in our online study provided self-reports of anticipated, perceived, and internalized stigma and stigma-related isolation, as well as psychological distress and somatic symptoms. Results showed that both psychological distress and somatic symptoms could be predicted using self-reported stigmatization, and that these effects were driven by the contributions of internalized stigma and stigma-related isolation rather than anticipated or perceived stigma. Moreover, the relations between internalized stigma and stigma-related isolation, and somatic symptoms, were mediated by psychological distress. Stigma-related isolation also moderated the direct effect of internalized stigma on somatic symptoms, but not the indirect effect through psychological distress. These findings indicate that internalized shame around abortion and deliberate isolation from others are associated with impaired well-being.

Our evidence that both internalized abortion stigma and stigma-related isolation predict psychological distress supports our prediction that increased abortion stigma would be associated with increased psychological distress. Moreover, we sought to investigate which aspects of abortion
stigma would best predict psychological distress, and our finding is in line with previous literature, including a qualitative study demonstrating perceived and internalized stigma is related to psychological distress (Gelman et al., 2017), and meta-analytic evidence that secrecy around abortion links to psychological distress (Hanschmidt et al., 2016). Our results also support prior evidence on stigma more generally. For example, internalized stigma has been related to increased psychological distress in those living with HIV (Audet et al., 2013; Miller et al., 2016; Simbayi et al., 2007) and those with mental illness (Pérez-Garín et al., 2015), and it has previously been argued that such effects would also be seen in those subject to abortion stigma (Major et al., 2009). Cockrill and Nack (2013) suggest that the concealability of abortion, although apparently allowing the avoidance of stigmatization, actually contributes to the feeling of having done something shameful, which leads to psychological distress. In the current study, we cannot show a causal link, but we do demonstrate that these particular aspects of abortion stigma are related to psychological distress, which is novel in the context of abortion stigma. Previous investigations of ILAS subscales shows them to be distinct but interrelated subscales, but does not link them differentially to outcomes of impaired well-being (Cockrill et al., 2013). As such, our study advances understanding of how abortion stigma is linked to psychological well-being.

We also tested which aspects of abortion stigma would best predict somatic symptoms, and our demonstration that internalized stigma most reliably predicts somatic symptoms is a clear advance on current knowledge. The finding is consistent with previous studies showing internalized stigma is associated with reduced physical well-being (Miller et al., 2016) and chronic illness comorbidity and low CD4 count (Earnshaw et al., 2013) in individuals with HIV/AIDS. Our results build on those of studies focusing on internalized homonegativity, which show this to predict more severe physical health symptoms (e.g., Denton et al., 2014). Compared to the literature related to psychological distress, studies demonstrating a link to physical health symptoms are restricted to fewer types of stigmatized group; the addition of our findings to this literature is particularly
important. Although experts have suggested that abortion stigma would affect physical health (Major et al., 2009), studies have not tended to focus on evidencing this link. The contribution of stigma-related isolation to predicting somatic symptoms will need to be investigated more in the future, as this effect was close to significance in our dataset, yet did not reach significance when other aspects of stigma were included. While we cannot make claims regarding this finding, we believe stigma-related isolation is an interesting aspect that should be explored more in future research. Indeed, as indicated by our later analysis using stigma-related isolation as a moderator, this variable may play a more complex role in driving the effects of stigma on well-being.

One unexpected finding was that ILAS subscales that measure anticipated and perceived stigma did not predict either psychological distress or somatic symptoms. Of course, the aim of our study was to investigate to what extent each aspect of stigma helped to predict both outcomes, with no specific expectation for which would contribute most. However, previous research shows clear links between anticipated stigma, perceived stigma, experienced stigma, and either psychological distress (Audet et al., 2013; Chaudoir & Quinn, 2010; Major & Gramzow, 1999), physical health (Earnshaw et al. 2013) or both (Miller et al. 2016; O’Donnell et al., 2015; Quinn & Chaudoir, 2009). It should be noted, though, that not all studies include multiple measures of stigma and fewer studies include internalized stigma or stigma-related isolation compared to anticipated, perceived, and experienced stigma (for exceptions, see Earnshaw & Quinn, 2011; Earnshaw et al., 2013; Quinn et al., 2014). In the current study, all aspects of stigma were entered into models at the same time. If only anticipated and perceived stigma were included, these would actually predict psychological distress and somatic symptoms; however, the variance explained by these factors is not unique from that explained by internalized stigma and, to a lesser extent, stigma-related isolation. Future studies should seek to replicate this finding to determine if it is robust, ideally with a larger sample size, and indeed to investigate if it is specific to abortion stigma or also translates to other concealable
stigmatized identities. Indeed, while our findings clearly support previous claims that abortion stigma is multifaceted, it may still be that some aspects have greater consequences for well-being.

Based on previously demonstrated indirect effects in the stigmatized identities literature that showed stigma is related to somatic symptoms through psychological distress, we also investigated indirect effects in the current study. Our findings showed that the effects of both internalized stigma and stigma-related isolation on somatic symptoms were mediated by psychological distress. It seems that internalizing the negative stereotypes and sense of shame around abortion, and deliberately isolating oneself because of this, may be associated with increased psychological distress and, in turn, more experience of somatic symptoms such as headache, insomnia and stomach upsets. These results are in accord with research on other stigmatized identities that show similar mediation effects (Miller et al., 2016; O’Donnell et al., 2015), which extends the more general literature on health outcomes associated with stigmatization. However, they also expand our understanding of abortion stigma more specifically, as such a process has not previously been demonstrated with regard to this group.

We also tested whether stigma-related isolation would moderate the effect of another aspect of stigmatization, internalized stigma, on both psychological distress and somatic symptoms. This was based on the notions that (a) stigma is stressful, (b) stigma-related isolation is the inverse of social support, and (c) social support is known to buffer against stress (Cohen & Wills, 1985). Against predictions, we found that there was no moderating effect on the indirect pathway via psychological distress. It must be noted that there are no other studies that examine this specific relation, against which to compare our findings. While there is past research showing that social support moderates the effect of stressors such as mental health stigma on depressive symptoms (Lindsey et al., 2010), our results are not inconsistent with these. In our sample, although the moderating effect of stigma-related isolation on the relation between internalized stigma and psychological distress did not reach significance, the pattern of results was consistent with those in
past studies. It was the more complex relation between internalized stigma, stigma-related isolation, psychological distress and the outcome, somatic symptoms, that was not supported. The indirect link from internalized stigma to somatic symptoms via psychological distress was apparent at every level of stigma-related isolation.

Conversely, our findings in relation to the direct effect were as expected: the direct effect between internalized stigma and somatic symptoms was moderated by stigma-related isolation. Only those with high levels of stigma-related isolation showed the link from internalized stigma to somatic symptoms. This fits with previous research on the stress-buffering hypothesis and its link to physical health (Cantwell et al., 2014). However, the result is novel in the context of abortion stigma and sheds light on the process by which abortion stigma negatively affects health. Overall, we interpret our findings as indicating that greater internalized stigma predicted more somatic symptoms through increased psychological distress, regardless of stigma-relation isolation; while internalized stigma only directly predicted increased somatic symptoms when stigma-related isolation was high.

**Limitations and Directions for Future Research**

Despite the significance and novelty of the current findings, there are some important limitations to the study that must be acknowledged. First, as a cross-sectional study, this study cannot provide causal evidence for the relations shown here. On the basis of prior research, one might assume that stigmatization leads to feelings of psychological distress (e.g., Major & Gramzow, 1999) and that psychological distress then leads to physical health symptoms (e.g., Miller et al., 2016). However, unlike these cited studies, the current investigation was not longitudinal. It seems clear that, given the potential theoretical and practical implications of the current findings, they should be replicated longitudinally to provide more conclusive evidence for the proposed relations.

Moreover, while it is fascinating to examine these relations in a context where abortion access is highly restricted, it would be ideal to replicate the findings in a context that is otherwise
similar but where abortion is legal, such as the UK—or more importantly, to compare the two contexts. As noted by Kumar and colleagues (2009), abortion stigma is not absolute but rather socially constructed on a local basis. It is entirely possible that for women based in Ireland, the illegality and need to travel for an abortion may heighten internalized stigma and thus have the greatest effect in this setting. As noted in the Introduction, Cockrill and colleagues’ (2013) ILAS measure contains four stigma subscales that typically correlate with the total scale, but not with one another. In our study, as reported in our Results, all subscales correlated with one another. At present, we can only speculate that in Ireland, different aspects of abortion stigma might be more closely related to one another due to the inherent secrecy and illicit nature of abortion, compared to settings where abortion is legal. However, further research may elucidate the different pattern of results.

It is also important for researchers to include other measures of physical health outcomes. In the current study we focused on somatic symptoms, which is consistent with some past research on stigmatized identities that examined minor health complaints (e.g., O’Donnell et al., 2015; Quinn & Chaudoir, 2009). Psychological distress could be related to actual higher incidence of symptoms, or merely a perception of more symptoms, because of the distress (Cohen & Williamson, 1991). In terms of the people’s experience, this distinction may not actually matter, but it is still important for research to distinguish between the two possibilities by including some more objective measures of health.

Finally, we propose further investigation of the abortion stigma concept and measurement, including how each aspect differs from other related concepts. For example, while it is both interesting and useful to demonstrate the strong predictive capacity of internalized stigma in relation to psychological distress and physical health symptoms, we must acknowledge that this should be distinguished from individual difference variables such as low self-esteem. Some stigma researchers have started to incorporate individual difference measures in order to control for these variables (e.g.,
Quinn et al., 2014). Unfortunately, we did not include such measures in the present study so this is one way for future research to build upon the current findings.

The aspect of stigma we named stigma-related isolation also requires further investigation. It measures the person’s perception that they cannot let others know about their abortion because it is too stigmatizing, which prohibits the accessing of social support (Audet et al., 2013; Hatzenbuehler et al., 2009). As shown in our findings, stigma-related isolation worked in a similar way to more general social support (Cohen & Wills, 1985) in moderating the effect of another stigma aspect on physical health symptoms (Cantwell et al., 2014)—although this was not the case when it came to the mediated pathway through psychological distress. While it is clear that stigma-related isolation is a narrow and specific aspect of (lack of) social support, it would be useful to know how this concept relates to social support more generally. Research might measure both concepts to explore this possibility. It would also be interesting to determine whether a more general measure of social support would support the predicted moderation of the indirect effect of internalized stigma on somatic symptoms through psychological distress.

**Practice Implications**

This research has implications for those who work to support women who have had abortions, those engaged in activism for or against abortion access, and those involved in policy-making. In terms of interpersonal support, therapists working with clients who present as distressed following an abortion should be mindful that this distress may not necessarily be driven by regret. Rather, the internalization of abortion stigma may complicate women’s feelings about the abortion. Given our finding about how stigma-related isolation can impact the relation between internalized stigma and somatic health symptoms, therapists could also encourage clients to reach out to their networks of family and friends, to avoid isolation.
At a broader level, it is important not to underestimate how stigma is created and communicated. A person can only internalize stigma when they perceive that societal stigma exists. Those in positions of authority and influence should take care when debating reproductive rights. One prominent concern of pro-life activists is the potential for abortion to cause damage to women’s mental health (e.g., Reardon, 1987). This concern is not supported by evidence (Major et al., 2009; Rubin & Russo, 2004), while our findings show that abortion stigma is related to psychological and physical health problems. Arguments that link abortion to psychological health problems could inadvertently increase the stigmatization of abortion, as psychological health problems are unfortunately also stigmatized (Corrigan et al., 2006). We suggest all activists have a responsibility to avoid increasing stigma in this manner, although we acknowledge it is challenging to agree on appropriate argumentation given the controversial nature of the issue. For pro-choice activists, our findings highlight the importance of advocating for societal understanding and acceptance, rather than stigmatization.

Going beyond activists to the policy-makers they hope to influence, this group too has a clear responsibility. The context of our study was Ireland, where at the time of writing, abortion is illegal except to save the life of the woman. Although Ireland’s abortion law is unusual relative to other developed Western nations, reproductive rights face challenges elsewhere, such as in the United States (BBC News, 2017). Access to abortion is therefore a topical issue. Those charged with debating and deciding policy around access to abortion should be cautious that their discussion of this matter does not inadvertently increase the stigmatization of abortion by conflating it with psychological and physical health problems.

Conclusions

Overall, our study has contributed to the literature examining the detrimental effects of abortion stigma on psychological and physical health problems. Our findings are consistent with
literature on health outcomes associated with stigma more generally, as well as abortion stigma specifically, but they also extend these findings. Our study answers an explicit call by Hanschmidt and colleagues (2016) for more research investigating the impact of abortion stigma on psychological distress and, in particular, to investigate the contribution of internalized abortion stigma. This study is the first to test the relative contribution of each stigma aspect in predicting both psychological distress and somatic symptoms, building on the work of Cockrill and colleagues (2013) who developed this multidimensional measure of abortion stigma. By focusing on somatic symptoms, we advance not only the literature on abortion stigma but also understandings of the range of health outcomes associated with stigmatization.

The fact that internalized stigma and self-imposed isolation contributed the most to our understanding of psychological and physical health problems does not mean that stigmatization is only an individual-level issue, rather than also a social and structural one. Much research evidence suggests that anticipated and perceived stigma negatively impact well-being, and indeed internalized stigma is significantly related to both of these. As noted above, the negative attitudes around abortion that women internalize are societal attitudes (as evidenced by the very high perceived stigma in our sample). In addition, even where women have managed to avoid internalizing negative societal attitudes around abortion, this is associated with distancing themselves from other women who have had abortions and providing justification for their own abortion (e.g., Hoggart, 2017). This type of reasoning highlights that negative attitudes still exist and create a barrier between women who could otherwise support one another, reducing feelings of stigmatization. Although abortion itself is not reliably linked to impaired well-being (e.g., Major et al., 2009), the stigmatization of abortion has very real consequences for women’s psychological and physical well-being. And so, in seeking to properly support women who access abortion, the issue of stigmatization should be addressed at both the individual and societal level. Individually, we must recognize the potential for stigmatization to negatively impact women who have had an abortion, and collectively we must challenge arguments
that increase this stigmatization. Regardless of each person’s view on abortion, stigmatization serves no positive function in our society.

References


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Table 1

Correlations, Means, and Standard Deviations for Predictor Variables (1-4), Mediator and Outcome Variables (5-6), and Control Variables (7-11).

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>Possible range</th>
<th>M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Anticipated stigma</td>
<td>-</td>
<td>.52***</td>
<td>.47***</td>
<td>.38***</td>
<td>.33***</td>
<td>.30***</td>
<td>-.28**</td>
<td>-.22</td>
<td>.04</td>
<td>-.15</td>
<td>.02</td>
<td>0-3</td>
<td>1.74 (0.92)</td>
</tr>
<tr>
<td>2. Perceived stigma</td>
<td>-</td>
<td>.37***</td>
<td>.40***</td>
<td>.23**</td>
<td>.20*</td>
<td>-.26**</td>
<td>-.16*</td>
<td>-.08</td>
<td>-.06</td>
<td>.24**</td>
<td>0-4</td>
<td>2.39 (1.13)</td>
<td></td>
</tr>
<tr>
<td>3. Internalized stigma</td>
<td>-</td>
<td>.39***</td>
<td>.50***</td>
<td>.46***</td>
<td>-.43***</td>
<td>-.12</td>
<td>-.05</td>
<td>-.17*</td>
<td>-.13</td>
<td></td>
<td>0-4</td>
<td>1.54 (0.96)</td>
<td></td>
</tr>
<tr>
<td>4. Stigma-related isolation</td>
<td>-</td>
<td>.39***</td>
<td>.30***</td>
<td>-.27**</td>
<td>-.05</td>
<td>-.11</td>
<td>-.08</td>
<td>.04</td>
<td>0-3</td>
<td>1.27 (0.89)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Psychological distress</td>
<td>-</td>
<td>.80***</td>
<td>-.21**</td>
<td>-.13</td>
<td>-.06</td>
<td>-.01</td>
<td>-.07</td>
<td>0-42</td>
<td>9.68 (8.76)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Somatic symptoms</td>
<td>-</td>
<td>-.13</td>
<td>-.18*</td>
<td>.03</td>
<td>.02</td>
<td>-.07</td>
<td>14-98</td>
<td>43.17 (16.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Religion</td>
<td>-</td>
<td>.06</td>
<td>.04</td>
<td>.20*</td>
<td>.03</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Nationality: IvE</td>
<td>-</td>
<td>-.06</td>
<td>-.05</td>
<td>.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Nationality: IvA</td>
<td>-</td>
<td>-.03</td>
<td>.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Nationality: IvO</td>
<td>-</td>
<td>-.07</td>
<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>11. Time since abortion</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8.67 (9.18)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. ***p<.001. **p<.01. *p<.05. Nationality dummy variables are identified as follows: IvE = Irish vs. European; IvA = Irish vs. American; IvO = Irish vs. Other.
Table 2

Hierarchical Multiple Regression Analysis Predicting Psychological Distress and Somatic Symptoms Using Control Variables and Stigma Subscales.

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Psychological Distress</th>
<th></th>
<th></th>
<th>Somatic Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B (SE)</td>
<td>β</td>
<td>p</td>
<td>R²</td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td>-3.72 (1.45)</td>
<td>-.21</td>
<td>.01</td>
<td>.07</td>
</tr>
<tr>
<td>Nationality: IvE</td>
<td>-3.67 (2.62)</td>
<td>-.11</td>
<td>.16</td>
<td>.22</td>
</tr>
<tr>
<td>Nationality: IvA</td>
<td>-2.43 (3.62)</td>
<td>-.05</td>
<td>.50</td>
<td>.25</td>
</tr>
<tr>
<td>Nationality: IvO</td>
<td>1.34 (4.48)</td>
<td>.02</td>
<td>.77</td>
<td>.32</td>
</tr>
<tr>
<td>Time since abortion</td>
<td>-0.04 (0.08)</td>
<td>-.04</td>
<td>.61</td>
<td>.27</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td>0.35 (1.39)</td>
<td>.02</td>
<td>.80</td>
<td>.27</td>
</tr>
<tr>
<td>Nationality: IvE</td>
<td>-1.90 (2.35)</td>
<td>-.06</td>
<td>.42</td>
<td>.22</td>
</tr>
<tr>
<td></td>
<td>Nationality: IvA</td>
<td>Nationality: IvO</td>
<td>Time since abortion</td>
<td>Anticipated stigma</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>------------------</td>
<td>------------------</td>
<td>---------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td></td>
<td>-0.88 (3.18)</td>
<td>4.62 (3.94)</td>
<td>0.01 (0.07)</td>
<td>0.76 (0.85)</td>
</tr>
<tr>
<td></td>
<td>-.02 .78</td>
<td>.08 .24</td>
<td>.01 .92</td>
<td>.08 1.37</td>
</tr>
<tr>
<td></td>
<td>5.01 (6.00)</td>
<td>9.60 (7.44)</td>
<td>0.002 (0.14)</td>
<td>1.37 (1.60)</td>
</tr>
<tr>
<td></td>
<td>.06 .41</td>
<td>.10 .20</td>
<td>.001 .99</td>
<td>.08 .39</td>
</tr>
</tbody>
</table>

Note: Nationality dummy variables are identified as follows: IvE = Irish vs. European; IvA = Irish vs. American; IvO = Irish vs. Other.
Table 3

Parameter Estimates of the Models Examining the Mediating Role of Psychological Distress in the Relation Between Internalized Stigma (Model A) and Stigma-Related Isolation (Model B), and Somatic Symptoms.

<table>
<thead>
<tr>
<th>Mediation Model A: Internalized Stigma (IS) as Predictor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Model without mediator</td>
</tr>
<tr>
<td>Intercept</td>
</tr>
<tr>
<td>IS → SS (c)</td>
</tr>
<tr>
<td>$R^2 (y,x)$</td>
</tr>
<tr>
<td>Model with mediator</td>
</tr>
<tr>
<td>Intercept</td>
</tr>
<tr>
<td>Model 1: PD as outcome variable</td>
</tr>
<tr>
<td>IS → PD (a)</td>
</tr>
<tr>
<td>Model 2: SS as outcome variable</td>
</tr>
<tr>
<td>PD → SS (b)</td>
</tr>
<tr>
<td>IS → SS (c')</td>
</tr>
<tr>
<td>Indirect effects (a x b)</td>
</tr>
<tr>
<td>$R^2 (m,x)$</td>
</tr>
<tr>
<td>$R^2 (y,m,x)$</td>
</tr>
</tbody>
</table>
### Mediation Model B: Stigma-Related Isolation (SRI) as Predictor

<table>
<thead>
<tr>
<th>Model</th>
<th>Estimate</th>
<th>SE</th>
<th>p</th>
<th>CI (lower)</th>
<th>CI (upper)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model without mediator</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>38.55</td>
<td>2.86</td>
<td>&lt;.001</td>
<td>32.90</td>
<td>44.19</td>
</tr>
<tr>
<td>SRI → SS (c)</td>
<td>5.24</td>
<td>1.45</td>
<td>&lt;.001</td>
<td>2.38</td>
<td>8.10</td>
</tr>
<tr>
<td>$R^2 (y,x)$</td>
<td>0.14</td>
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<tr>
<td><strong>Model with mediator</strong></td>
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</tr>
<tr>
<td>Intercept</td>
<td>28.70</td>
<td>1.91</td>
<td>&lt;.001</td>
<td>24.92</td>
<td>32.47</td>
</tr>
<tr>
<td><strong>Model 1: PD as outcome variable</strong></td>
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<tr>
<td>SRI → PD (a)</td>
<td>3.56</td>
<td>0.77</td>
<td>&lt;.001</td>
<td>2.04</td>
<td>5.07</td>
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<tr>
<td><strong>Model 2: SS as outcome variable</strong></td>
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</tr>
<tr>
<td>PD → SS (b)</td>
<td>1.47</td>
<td>0.10</td>
<td>&lt;.001</td>
<td>1.28</td>
<td>1.66</td>
</tr>
<tr>
<td>SRI → SS (c')</td>
<td>0.007</td>
<td>0.97</td>
<td>.99</td>
<td>-1.92</td>
<td>1.93</td>
</tr>
<tr>
<td>Indirect effects (a x b)</td>
<td>5.23</td>
<td>1.28</td>
<td></td>
<td>2.82</td>
<td>7.76</td>
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<tr>
<td>$R^2 (m,x)$</td>
<td>.18</td>
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</tr>
<tr>
<td>$R^2 (y,mx)$</td>
<td>.66</td>
<td></td>
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</tr>
</tbody>
</table>

*Note.* Religion, nationality, and time since abortion were included as covariates in all regression analyses but are omitted here for brevity; none were significant in any of the models. We have also illustrated regression weights for a, b, c, and c’ for both models in Figure 1. $R^2 (y,x)$ is the proportion of variance in $y$ explained by $x$, $R^2 (m,x)$ is the proportion of variance in $m$ explained by $x$, and $R^2 (y,mx)$ is the proportion of variance in $y$ explained by $x$ and $m$. The 95% CI for $a \times b$ is obtained by the bias-corrected bootstrap with 5000 resamples. In model A, IS (internalized stigma) is the predictor variable ($x$) whereas in model
B SRI (stigma-related isolation) is the predictor variable \((x)\); in both models PD (psychological distress) is the mediator \((m)\), and SS (somatic symptoms) is the outcome \((y)\).

CI (lower) = lower bound of 95% confidence interval; CI (upper) = upper bound of 95% confidence interval.
*Figure 1a*

![Diagram](image1a.png)

*Figure 1b*

![Diagram](image1b.png)

*Figure 1.* Unstandardized regression coefficients for the relation between internalized stigma (x, *Figure 1a*) / stigma-related isolation (x, *Figure 1b*) and somatic symptoms (y), as mediated by psychological distress (m). The $c'$ pathway refers to the direct effect of x on y; the c pathway refers to the indirect effect of x on y through the mediator, m.
Figure 2. Unstandardized regression coefficients for the conditional direct and indirect effects of internalized stigma \((x)\) on somatic symptoms \((y)\) via psychological distress \((m)\), as moderated by stigma-related isolation \((w)\). The dashed line signifies non-significant effect of the moderator on the indirect pathway.