ORIGINAL ARTICLE

Evaluating the role of perceived injustice in mental health outcomes in cervical cancer care

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Abstract

Purpose Perceived injustice is a novel psychosocial construct which reflects negative cognitive appraisals of blame, unfairness, and the severity and irreparability of one's loss. Experiences of injustice are increasingly recognised as a key determinant of recovery outcomes in healthcare. The aim of this study was to explore the impact of perceived injustice on psychological outcomes amongst a group of cancer patients and survivors who received false-negative smear results under a National Cervical Cancer Screening Programme (CervicalCheck).

Methods Women who received false-negative smear results who were involved in the CervicalCheck controversy in Ireland completed online measures of perceived injustice (IEQ), psychological distress (depression and anxiety as measured by the HADS), and satisfaction with care (PSCC) ($n = 144$).

Results Rates of psychological distress in this sample were high, with 76% scoring in the clinical range for anxiety, 51% in the clinical range for depression, and 88% in the clinical range for perceived injustice. Hierarchical regression analyses revealed that perceived injustice contributed unique variance to the prediction of depression and anxiety. Satisfaction with care significantly moderated the association between perceived injustice and depression.

Conclusions Cancer patients who report high levels of perceived injustice are at greater risk for experiencing psychological distress. The relationship between perceived injustice and depression may vary as a function of satisfaction with care. Addressing issues of perceived injustice in the psychosocial and rehabilitative care of cancer patients may support the early identification of those at risk of significant psychological distress and enhance intervention success. Implications for policy and practice in healthcare are discussed.

Keywords Perceived injustice · Mental health · Cancer support · Cervical cancer · Open disclosure

Introduction

A range of physical, social, psychological, and existential stressors are associated with cancer diagnosis and treatment. From a psychological perspective, the prevalence of depression and anxiety in cancer patients is high with rates of mood disorders reported in as many as 30–50% of cancer patients in hospital settings [1, 2]. The negative consequences of mood disorders in cancer patients and survivors is well documented and include reduced quality of life, maladaptive health behaviours, and poorer overall survival [3–5], stressing the importance of psychosocial input across the spectrum of cancer care. However, two patients with very similar physical experiences may have completely different psychological responses, and similar psychological responses could arise from widely varying physical experiences [6]. This poses a challenge to those involved in the psychosocial and rehabilitative care of cancer patients. Such reported heterogeneity of the cancer experience highlights the need for studies to examine the mechanisms by which illnesses exert their influence on psychosocial outcomes. This may support health care professionals in the early identification of those at increased risk of chronic mental health

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difficulties and facilitate the development and delivery of more targeted, appropriate interventions in psychosocial and rehabilitative cancer care.

This study examines the role of *perceived injustice* as a mechanism which may influence psychological outcomes in cancer care. Perceived injustice was originally explored in the pain and rehabilitation literature as a factor that influenced recovery outcomes in acute and chronic pain populations. More recently, its role has been evaluated in other clinical conditions including major depressive disorder, menstrual pain, and HIV [7–9]. Defined as a negative cognitive appraisal that reflects blame, unfairness, and the severity and irreparability of one's loss [10], perceived injustice is now widely recognised as a risk factor for problematic recovery [11]. A growing body of evidence demonstrates significant associations with a variety of physical, psychological, and functional outcomes such as depression, anger, stress, more intense pain, higher levels of self-reported disability, and likelihood of returning to work [12, 13]. The impact of perceived injustice is notable in that it predicts poorer physical and psychosocial outcomes above and beyond demographic or injury-related factors [14]. An understanding of the link between perceived injustice and distress in an oncology population may provide researchers and clinicians in this field with valuable insight into an important and thus far unexplored determinant of mental health outcomes in cancer.

Perceived injustice has been most frequently considered from the theoretical perspective of Just World Beliefs, which purports that humans are socialised to view the world as consistent, predictable and fair. When an individual is exposed to situations or events that are characterised by a violation of their rights, a transgression of status or a challenge to their perceived norms and beliefs, such fundamental assumptions about ourselves, others and the world around us are shattered and perceptions of injustice can arise with profound consequences for coping and adjustment. The potential sources of perceived injustice in one's experience of illness are varied and include healthcare providers, insurance providers, God, science, self, the government and family [15]. It is important to consider that perceptions of injustice are not merely mental constructions, and are often reflective of some degree of actual injustice in the environment. For example, hospitalised cancer patients have a 39% greater risk of experiencing an adverse event compared to other patients, due to longer stays in hospital and more complex surgical procedures [16].

The primary objective of this study is to evaluate the role of perceived injustice in psychological outcomes amongst a group of women who received false-negative smear tests as part of a cervical cancer screening programme. More specifically, the National Cervical Cancer Screening Programme in Ireland (CervicalCheck) became the centre of much controversy in 2018 after smear tests of women who were subsequently diagnosed with cervical cancer were selected for a quality review. Of over 1200 women included in this retrospective audit, it was found that for 221 women, the screening test should have provided a different result (see Appendix A for more detailed information) [17, 18]. While audits of this type are expected to reveal some missed abnormalities, an independent inquiry determined that across several cytology laboratories, many smears were read in a manner that was negligent and in breach of duty [19]. This resulted in a delay in diagnosis and deprived many women of the opportunity of timely treatment. Furthermore, at the time of the retrospective audit, false-negative smear results were not disclosed to women in 80% of cases [19]. A qualitative study carried out with several of the women who were impacted by the CervicalCheck controversy identified strong perceptions of injustice from their experience of perceived negligence and non-disclosure [20]. These interviews also identified dissatisfaction with quality of care for cervical cancer more broadly, and disappointment in the lack of openness and transparency from clinicians with regard to their original smear result [20]. Therefore, a secondary objective of this study was to determine whether patient satisfaction with care strengthened or ameliorated the impact of perceived injustice on psychological distress in this setting.

Accordingly, this study aims to (a) characterise the profile of psychological distress in this particular group of women, (b) determine the strength of association between perceived injustice and depression and anxiety, (c) investigate whether these associations are independent of pre-existing mental health symptoms, CoViD-related distress and demographic characteristics, and (d) assess the moderating impact of satisfaction with care on the association between perceived injustice and psychological distress.

Methods

Study setting

This study employed a cross-sectional, observational design, and utilised responses from an online survey that were collected between June and October 2020. Participants were recruited from a patient support group that was established to support women and families affected by the CervicalCheck controversy. Only women who were identified in the original audit (by the Health Service Executive) or in the subsequent review by the Royal College of Obstetricians and Gynaecologists were eligible to enrol as a member of the group. The support group meets the needs of its membership by hosting quarterly member meetings that provide information regarding the ongoing inquiries into the CervicalCheck controversy and offer cancer survivorship support in the form of specialised workshops. The group also liaises

with community organisations, ensures representation on government committees, and runs a private member online portal which provides up-to-date information, expert advice and peer support.

Participants

Women who were directly impacted by the CervicalCheck controversy were recruited via an advertisement in routine email correspondence within the patient support group. Members were invited to click a link to an online participant information sheet and an online consent form. To be eligible for inclusion in the study, each respondent had to confirm that they were a registered member of the support group, that they were over the age of 18, and that they were directly impacted by the CervicalCheck failings. Next of kin and family members were excluded from this study. Power calculation for multiple regression using G*Power [21] indicated that a minimum sample size of $n = 85$ was required to achieve a power of 0.80 in a design with an estimated medium effect size and a total of six predictor variables.

Measures

Demographics Participants were asked to record their age, first language, education, employment, health/treatment status, children yes/no, whether they received their care through the public health system or the private health insurance system, and their perception of their pre-existing mental health in the year prior to the CervicalCheck controversy (*Very Good, Good, Only Okay, Poor, Very Poor*). For the purpose of analysis, pre-existing mental health was dichotomised with responses of '*Poor*' and '*Very Poor*' coded as having pre-existing mental health difficulties.

Psychological distress The Hospital Anxiety and Depression Scale [22] (HADS) was used to measure psychological distress, providing a subscale score for anxiety symptoms ($\alpha = 0.849$) and a subscale score for depressive symptoms ($\alpha = 0.836$). Each of the 14 items on the questionnaire has a Likert response scale and is scored from 0–3.

Perceived injustice Injustice was measured using the Injustice Experience Questionnaire [10] (IEQ). The IEQ is a 12-item scale that asks respondents to indicate the frequency with which they experience different thoughts concerning the sense of unfairness and the level of severity in relation to their injury (e.g. "I am suffering because of someone else's negligence" and "My life will never be the same"). The scale utilises a 5-point Likert response ranging from 0 (*Never*) to 4 (*All the time*), with higher scores indicating higher perceptions of injustice. Studies have identified a score of 30 as an established cut-off value for clinically relevant levels

of perceived injustice [23]. Clinically relevant levels of perceived injustice relate to levels of perceived injustice that are high enough to have a palpable and noticeable effect on the daily life of the individual. Another study proposed that a total score above 19 may represent a barrier to return to work [24]. The IEQ demonstrated good internal consistency in this population sample ($\alpha = 0.932$).

Satisfaction with care The Patient Satisfaction with Cancer Care scale [25] (PSCC) was developed to assess satisfaction with cancer-related care, from screening to treatment of diagnosed cancer. This unidimensional 18-item scale uses a 5-point Likert response style (1 = *Strongly Agree* to 5 = *Strongly Disagree*). The total scale score is obtained by adding scores on all items, with lower scores indicating higher satisfaction with cancer care. Cronbach's alpha for the PSCC in the current study was 0.935, indicating high internal consistency.

Impact of CoViD-19 pandemic To account for the confounding impact of CoViD-19-related distress in responses, each participant was asked "To what extent has the CoViD-19 pandemic contributed to any stress for you over the past few months?" The single item scale utilised a four-point response (1 = *Not at all*, 2 = *A little*, 3 = *To some extent*, 4 = *To a great extent*).

Procedure

Ethical approval was granted by University College Dublin Research Ethics Committee (HS-20–05-Lynch-Gaynor). Participants were recruited via routine email correspondence to the patient support group, facilitated by the group co-ordinator. Reminder emails were sent on two separate occasions to increase response rate in recruitment. Email correspondence contained a link to the survey hosted by Qualtrics which led directly to an information sheet, followed by an online consent form. Participants could not advance to the questionnaire without completing the consent form. Upon completing the online survey, participants were thanked, debriefed, and provided with the contact details of support services available to them.

Data analysis

Data were analysed using SPSS (Version 26). A response was requested for each individual item so missing data was minimal (0.08% values missing across the entire dataset). Little's MCAR test revealed that this data was missing at random ($p = 0.881$), therefore an Expectation–Maximisation (EM) procedure was considered appropriate to impute missing values. Sample characteristics were reported for

all demographic and outcome variables. Outcome-related variables were tested for significant associations with perceived injustice using analyses of variance or bivariate correlations (non-parametric Spearman's Rho). Hierarchical regression analyses were conducted to explore the unique associations between perceived injustice and psychological outcomes of depression and anxiety. Initial checks confirmed assumptions of normality, linearity, and heteroscedasticity using histograms and scatterplots. To avoid the issue of multicollinearity, the sociodemographic variable most highly correlated with the dependent variables (out of education status, employment status, and private or public healthcare status) was entered into the first block of each regression analysis (namely, employment status). CoViD-related distress, pre-existing mental health and satisfaction with care were entered into the second and third blocks of the regression analyses, respectively (see Table 3). Participants' perceived injustice score was entered into the fourth and final block of all regression analyses. Results from the final models are reported. A moderator analysis using the PROCESS macro (Preacher and Hayes [26]) examined whether the associations between perceived injustice and psychological distress were moderated by satisfaction with care. Moderation analyses were conducted by re-estimating the regression model and adding interaction terms between perceived injustice and satisfaction with care. Moderator effects were further explored through a simple slopes analysis. Study variables were standardised before performing the moderation analyses. Accordingly, all model parameters are presented as standardised (β) coefficients to allow comparison across paths.

Results

Sample characteristics

Of approximately five hundred women[1] who were identified as being impacted by the controversy, 290 women were registered with the support group at the time of this study. Of the 169 who provided consent to participate, 144 completed the survey representing a response rate of approximately 50%. Closing the web browser before completing the survey was regarded as withdrawing from the study. Completers and withdrawers did not differ significantly on any demographic variables.

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[1] Precise figure not available. Estimated from number of women identified through original audit process ($n=221$) added to the number of women identified through the subsequent review by the Royal College of Obstetricians and Gynaecologists (RCOG) ($n=308$); however, there is overlap between these two groups with some women from original grouping also being included in RCOG review.

Sample characteristics are summarised in Table 1, along with means and standard deviations of outcome variables. Mean scores on the IEQ in this sample meet the threshold for clinically relevant levels of perceived injustice (overall IEQ score greater than 30) [23] and were significantly higher than those reported in previous clinical samples [12]. Specifically, the prevalence of perceived injustice scores in the low (<19), medium (19–29), and high/clinical (30+) range were 9.7%, 23.6%, and 66.7% respectively. Fifty-one percent of the sample fall in the clinical range for symptoms of depression, and 76% of the sample fall in the clinical range for symptoms of anxiety. Based on a clinical cut-off total score of ≥16 as indicated by the authors of the HADS [22], the sample can be characterised as experiencing significant psychological distress overall. Normative data is not yet available for the PSCC; therefore, raw scores are reported.

Table 1 Baseline demographic and clinical characteristics of the sample ($n=144$)

	N (%)
Gender	144 (100)
Female	
Age	2 (1.4)
20–30 years	37 (25.7)
30–40 years	68 (47.2)
40–50 years	25 (17.4)
50–60 years	10 (6.9)
60–70 years	1 (0.7)
70–80 years	1 (0.7)
80+ years	
Employment status	43 (29.9)
Full-time	46 (31.9)
Part-time	4 (2.8)
Seeking opportunities	31 (21.5)
Unemployed	9 (6.3)
Retired	11 (7.6)
Prefer not to say	
Children	121 (84)
Yes	23 (16)
No	
Health status	7 (4.9)
Still in active treatment	74 (51.4)
No longer in active treatment	57 (39.6)
Still receiving aftercare	6 (4.2)
Other	
	M (SD)
HADS	11.82 (4.35)
Anxiety	8.42 (4.29)
Depression	20.24 (7.75)
Total distress	
IEQ	16.90 (6.03)
Blame/unfairness	15.60 (5.67)
Severity/irreparability	32.50 (11.2)
Total score	
PSCC	52.61 (14.38)
Total satisfaction with care score	

Correlations and associations with participant characteristics

Correlations among study outcome variables appear in Table 2. Of note, the distribution of IEQ scores was negatively skewed, owing to the particularly high levels of perceived injustice experienced by this group. A log transformation was attempted, however failed to restore a normal distribution. A non-parametric alternative (Spearman's Rho, ρ) was therefore used to determine correlation coefficients. Perceived injustice showed moderate to strong positive correlations with depression ($\rho = 0.561$) and anxiety ($\rho = 0.528$). Satisfaction with care demonstrated a small to moderate positive correlation with depression ($\rho = 0.292$), anxiety ($\rho = 0.266$), and perceived injustice ($\rho = 0.266$).

An analysis of variance indicated no significant differences across psychological outcome variables between age groups. Respondents in part-time or full-time employment scored significantly lower on measures of depression [$t(142) = -3.65$, $p < 0.001$] and anxiety [$t(142) = -2.36$, $p = 0.020$] than respondents who were unemployed, retired, or seeking opportunities. Independent t-tests indicated that school-educated respondents scored significantly higher on measures of depression [$t(142) = -2.49$, $p = 0.014$] and anxiety [$t(142) = -2.86$, $p = 0.005$] than their college-educated counterparts. Independent t-tests indicated there were no significant differences in depression or anxiety between respondents with children and without children. Notably, respondents who were treated within the public health system reported significantly higher levels of dissatisfaction with their cancer care (55.47 ± 14.37) than respondents who accessed their care through the private health insurance system (47.56 ± 13.08), $t(142) = -3.28$, $p = 0.001$. Over 70% of respondents indicated that the CoViD-19 pandemic contributed to their stress over the past number of months 'to some extent' or 'to a great extent'. CoViD-related distress was significantly associated with higher levels of depression [$F(3, 140) = 4.81$, $p = 0.003$] and anxiety [$F(3, 140) = 9.50$, $p < 0.001$]. Just over 6% of the sample ($n = 9$) indicated that their mental health prior to the CervicalCheck controversy was 'poor' or 'very poor'. As expected, these respondents scored significantly higher on measures of anxiety [t

$(142) = -3.32$, $p = 0.001$] and depression [$t(142) = -2.63$, $p = 0.009$] than their counterparts with no pre-existing mental health difficulties.

Hierarchical regression analyses

The sociodemographic variable which displayed the most significant association with psychological outcomes was entered into the first step of the regression analysis (employment status), to provide a more conservative estimate of the additional variance accounted for by the psychosocial variables. To control for the effects of CoViD-related distress, participants' score on the CoViD scale was entered into the second block along with pre-existing mental health status. Satisfaction with care was positively associated with all outcome variables and therefore was entered into the third step of each regression model. Perceived injustice was entered into the fourth and final step. Table 3 presents the results of the hierarchical regression analyses with dependent variables of depression and anxiety.

After controlling for employment, pre-existing mental health and CoViD-related distress, satisfaction with care was entered in the third step of each model and contributed an additional 5% of the variance to the prediction of depressive symptoms ($F(1, 139) = 8.81$, $p = 0.004$) and an additional 4% of the variance to the prediction of anxiety ($F(1, 139) = 6.17$, $p = 0.014$). Perceived injustice was entered into the fourth step of each model and contributed an additional 15% of the variance to the prediction of depressive symptoms ($F(1, 138) = 34.45$, $p < 0.001$) and an additional 14% of the variance to the prediction of anxiety ($F(1, 138) = 32.92$, $p < 0.001$). Examination of beta weights in the final regression equations indicated that perceived injustice was a significant unique predictor of depression and anxiety.

Satisfaction with care as moderator

To explore the moderating role of satisfaction with care in the association between perceived injustice and psychological distress, the perceived injustice-satisfaction with care interaction term was entered in the final step of each regression. Satisfaction with care did not moderate the association between perceived injustice and anxiety, $F(1, 140) = 0.869$, $p = 0.353$. However, satisfaction with care contributed additional variance to the prediction of depressive symptoms, beyond the variance accounted for by the main effects of perceived injustice and satisfaction with care, $F(1, 140) = 4.253$, $p < 0.05$.

Post hoc probing of the simple slopes indicated that perceived injustice was significantly related to depressive symptoms at each level of satisfaction with care (low, average, and high). Standardised path coefficients are plotted in Fig. 1.

Table 2 Spearman's Rho associations between psychological outcome variables ($n = 144$)

| Variable	1	2	3	4
1. Perceived injustice				
2. Depression	.561**			
3. Anxiety	.528**	.576**		
4. Satisfaction with care	.266**	.292**	.266**	

**$p < 0.01$

Table 3 Hierarchical regression analyses examining association between perceived injustice and psychological outcome variables

Model/Step	Independent variable	F change	df	P value	Adjusted R^2	β	P value
Dependent: Depression							
1	Employment status	13.33	142	<.001	.08	.16	.026
2	Pre-existing mental health	8.89	140	<.001	.17	.16	.020
	CoViD-related distress					.13	.055
3	Satisfaction with care (PSCC)	8.81	139	.004	.22	.12	.105
4	Perceived Injustice (IEQ)	34.45	138	<.001	.37	.42	<.001
Dependent: Anxiety							
1	Employment status	5.56	142	.020	.03	.04	.608
2	Pre-existing mental health	20.55	140	<.001	.24	.23	.001
	CoViD-related distress					.28	<.001
3	Satisfaction with care (PSCC)	6.17	139	.014	.27	.08	.259
4	Perceived Injustice (IEQ)	32.92	138	<.001	.40	.40	<.001

Standardised β coefficients are from final regression equation

Fig. 1 Satisfaction with care moderates the association between perceived injustice and depression. Standardised beta coefficients are reported for all paths; **$p<0.001$
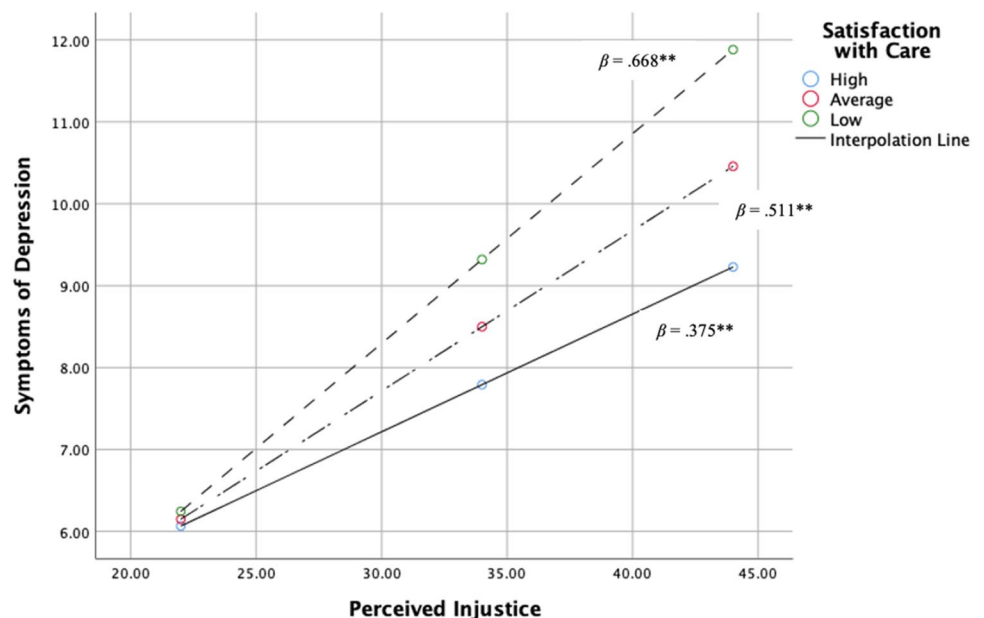
Discussion

This study sought to explore the role of perceived injustice in mental health outcomes among a group of women who received false-negative results in cancer screening, thus extending the application of perceived injustice beyond the diagnostic category of pain to a mixed group of cancer patients and survivors. The key findings of this study contribute novel insights to the fields of both perceived injustice and supportive cancer care. Firstly, over two-thirds of the sample report levels of perceived injustice that fall into the 'High' range (30+). The overall mean score on the IEQ in this sample (see Table 1) was found to meet the threshold for clinically relevant levels of perceived

injustice and was notably higher than those reported in previous clinical samples [12]. This identifies perceived injustice as one of the underlying psychological processes that may be at play in this group's experience of receiving a false-negative result in cancer screening and the non-disclosure of same. Fifty-one percent of the sample fell in the clinical range for symptoms of depression, and 76% of the sample fell in the clinical range for symptoms of anxiety. It is difficult to directly compare these prevalence rates with other cancer survivors in support groups as such figures are not reported in the literature. However, these figures are notably higher than the prevalence of depression and anxiety in cancer survivors generally, which a meta-analysis of 43 studies estimates to be 12% and 18% respectively [27]. Secondly, perceptions of injustice were

found to correlate with scores on outcome measures of depression and anxiety which is in line with pre-existing research in other patient groups [12]. Thirdly, hierarchical regression analyses revealed that perceptions of injustice contribute unique variance to the prediction of depression and anxiety after controlling for CoViD-related distress and pre-existing mental health, indicating that perceived injustice should be considered a relevant factor in contributing to psychological outcomes in non-pain-related samples. Finally, satisfaction with cancer care (which taps into informational, communicational, and interpersonal elements of care) was found to moderate the association between perceived injustice and depression. Specifically, low satisfaction with care was found to strengthen the relationship between perceived injustice and depression and high satisfaction with care was found to weaken the relationship.

Clinical implications

These findings make some novel and important contributions to psychosocial and rehabilitative care in oncology. The data offers preliminary evidence that a patient's experience of receiving a false-negative result in cancer screening may have implications for their psychological well-being, with levels of distress in this sample approximately four times higher than psychological distress in cancer survivors generally. Clinicians in the field of oncology would benefit from being aware of the potential psychological sequalae of false-negative results in screening, and where applicable, may wish to integrate into assessment an exploration of the patient's involvement in and perceived experience of screening services. More broadly, clinicians in oncology need to be aware of the general relevance of perceived injustice in contributing to mental health outcomes such as depression and anxiety. While negative cognitive biases have an identified role in depression [28], and the cross-sectional nature of this study limits the extent to which any inferences regarding causality can be made, recent prospective research has offered further insight into the sequential relation between perceived injustice and distress [8, 29], indicating that the relationship between these two variables is not bi-directional and reporting data to suggest that perceived injustice precedes depression, and not the other way around [8]. Given this, and given that symptoms of depression have important influences on health-related behaviours and functioning such as treatment engagement, compliance with rehabilitation and adherence to medication regimes [30–32] clinicians should consider exploring perceived injustice in standard assessment procedure in psycho-oncology practice. At a practical level, this may facilitate identification of patients who could be at greater risk of experiencing chronic psychological distress post-treatment and into their survivorship trajectory.

More importantly however, it contributes to the development of a meaningful psychological formulation for the patient, which refers to the process of making sense of a person's difficulties in the context of their life events and collaborating with the individual to understand their experience and learn how to move forward [33]. Integrating perceived injustice into assessment may help the practitioner to understand whether injustice appraisal processes are underlying or contributing to depressive symptomatology, and in doing so can help the client to make sense of their experiences. This provides the basis for an intervention plan tailored to the client's specific needs. Perceived injustice can be included in assessment through the use of a validated measure such as the Injustice Experience Questionnaire (IEQ), or by simply integrating questions that explore appraisals of blame, unfairness and irreparable loss into the clinical interview.

At a more nuanced level, our findings have implications for healthcare organisations and how they conduct themselves following an adverse event or when faced with an opportunity for open disclosure. The moderating role of satisfaction with care tentatively indicates that strategies such as an enhanced focus on bedside manner and open and honest communication may ameliorate the impact of perceived injustice on psychological distress in health-related settings. The value of open disclosure is largely supported by empirical research. Studies have reported that patients unequivocally want full disclosure of errors in their care, and that incomplete or ambiguous explanations of the error may increase distress [34]. From a systems perspective, the value of committing to open disclosure policies and procedures across the spectrum of healthcare (coupled with the required training and support for healthcare professionals) is worth considering in the context of the €832 million the Health Service Executive has paid out on medical negligence cases since 2014 alone [35]. Future research should aspire to track the implementation of open disclosure policies in Ireland, document patients' and clinicians' experience of this process and determine whether this has an impact on perceptions of injustice or intention to litigate.

Study limitations

The primary limitation of our findings concerns the cross-sectional nature of the analyses. As all variables were collected concurrently, inferences regarding causality of the relationship between injustice and distress cannot be made. While the response rate to the survey was objectively strong and adds to the generalisability of the findings to the wider group of women impacted by the CervicalCheck controversy, the unique nature of the group's experiences limits the generalisability of the research findings. To elaborate, they all received a false-negative result from an established cervical cancer

screening programme; many are involved in complicated litigation against the state; they unwittingly became part of a national controversy with significant media attention, and they are current members of a support group who have successfully lobbied the government to a) offer an apology on behalf of the state and b) adapt laws related to open disclosure. It is therefore important to acknowledge that they have experienced a range of difficulties beyond that of a cervical cancer diagnosis and related treatment, which has natural implications for the generalisability of findings. The inclusion of a control group of general cervical cancer survivors would have allowed for cancer-specific distress and cancer-specific injustice to be controlled in analyses. However, some measures were taken to address this, and respondents were asked to complete items on the IEQ specifically in relation to their involvement in the screening failure, not their cancer diagnosis. Measures to account for the impact of confounding variables such as CoViD-related distress adds to the quality of this study's methodology. However, the impact of CoViD-related distress should be interpreted with caution given that the variable was captured by a single-item question rather than a validated measure. Finally, participant's perceptions of their pre-existing mental health status were also captured by a single-item question and are naturally subject to memory bias.

Conclusion

This study illustrates the key role of perceived injustice in mental health outcomes in a sample of patients who received false-negative results in cancer screening. The findings represent an important step forward in identifying some of the psychological processes underlying the experience of perceived negligence and non-disclosure, and provide researchers and clinicians in oncology with valuable insight into an important and thus far unexplored determinant of mental health outcomes in cancer.

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Author contribution All authors contributed to study conception and design. All authors contributed to material preparation. Data collection and analysis were performed by Julie Lynch. The first draft of the manuscript was written by Julie Lynch, and all authors revised and contributed to subsequent versions of the manuscript. All authors read and approved the final manuscript.

Data availability Due to ethical restrictions and the issue of ongoing litigation for many participants, the data collected and analysed for this study is not publicly available.

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