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Preferences and Perceptions of Medical Error Disclosure Among Marginalized Populations: A Narrative Review.

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## **ABSTRACT**

**Background:** Disclosure of medical errors, in which a healthcare provider informs the patient/family of the error and takes responsibility, is an ethical imperative. Little is known about how medical error disclosure preferences or perceptions may vary for patients who are people of color, are older, or have lower educational attainment.

**Methods:** We conducted a narrative review around medical errors and disclosure. We included studies in high-income countries that included a predominantly marginalized population, defined by any one of the following: older age adults (mean age > 65 years); low educational attainment (> 55% of participants with less than a high school education); and/or racial/ethnic minority (< 55% of participants identifying as non-Hispanic white for US studies). We reported results according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

**Results:** The literature search yielded 3,050 articles, and we included six studies for analysis. Four studies used hypothetical vignettes; one used focus groups, and one used a survey. Three studies met our marginalized population criteria based on education; three met our criteria based on race/ethnicity. No study met our inclusion criteria for age. All six articles examined patient preferences for disclosure, and two studies also examined patient perceptions of disclosure. Overall, participants preferred that medical errors be disclosed to them. Most of the studies lacked multiple regression analysis to investigate differences in disclosure preferences by race/ethnicity, age, and education.

**Conclusion:** Participants from marginalized populations may have similar disclosure preferences to white and highly educated participants. Future studies should aim to examine differences in

error disclosure preferences among patients who have experienced adverse events across race/ethnicity, educational attainment, and age.

**Keywords**

medical errors

disclosure

adverse events

communication

marginalized populations

Adverse events constitute harm arising from medical care.<sup>2</sup> A significant proportion of adverse events are preventable and arise from errors or mistakes in the provision of medical care.<sup>3</sup>

Overall, adverse events cause 2.6 million deaths per year worldwide and carry significant costs to healthcare systems.<sup>4</sup>

There is an ethical imperative to disclose medical errors to patients and families.<sup>1</sup> The recommended process for medical error disclosure is for the physician to (1) provide an explicit statement that there has been an error; (2) describe what the error was; (3) explain why the error happened; (4) explain how recurrences will be prevented; and (5) offer an apology.<sup>5-11</sup> These actions are also highlighted in Nancy Berlinger's book *After Harm: Medical Error and the Ethics of Forgiveness*.<sup>12</sup> Berlinger further explores these actions ("relational ethical process") in the context of forgiveness and conceptualizes forgiveness as an outcome of acknowledging that an error has occurred and the effort made to amend the harm done.<sup>13,14</sup> Implementing the medical error disclosure process in clinical practice has the potential to improve patient safety and, consequently, improve the quality of care.<sup>7</sup> Prior studies have surveyed patients about medical error disclosure and found that patients have distinct preferences for how the difficult conversation of medical error disclosure should proceed. Patients expect clinicians to listen without interrupting, demonstrate empathy, and take responsibility.<sup>15,16</sup> Patients also prefer some sort of compensation as part of a disclosure conversation.<sup>15,16</sup> However, error disclosure is a complex communication process. As with other complex communication processes, such as end-of-life discussions,<sup>17</sup> different patient populations may have different preferences for how, when, and with whom this communication occurs. In addition, marginalized populations may have specific preferences for the disclosure of near misses or nonharmful errors. Most studies

examining patient preferences about medical error disclosure have been conducted largely among patients who are predominantly white and have high levels of educational attainment.<sup>11,15,18</sup> For example, in the landmark study by Gallagher et al.,<sup>11</sup> 88% of patients participating in the study identified as white, and 42% of participants reported attaining a college education.<sup>11</sup> Similarly, in a study by Mazor et al., 92% of study participants identified as white, and 39% of participants attained a high school education or less. Given the limited research on more diverse patient populations, there is a great need to better understand patients' preferences and perceptions about medical error disclosure.

Safety disparities for marginalized patients are well-documented. Previous studies have reported that people from non-white racial and ethnic backgrounds had higher rates of hospital-acquired infections, complications, adverse drug events, and dosing errors when compared to the overall population.<sup>19,20</sup> Additionally, limited English proficiency and cultural beliefs have contributed to an increased risk of safety events among marginalized populations.<sup>19</sup> Equity considerations are understudied in patient safety,<sup>21</sup> and it is unclear whether errors are routinely disclosed to marginalized populations.

Prior reviews have synthesized patients' preferences for medical error disclosure.<sup>22-24</sup> However, we are not aware of any prior reviews specifically focused on medical error disclosure preferences and perceptions of patients who are from predominantly marginalized populations (i.e., people of color, older age, or lower educational attainment). To inform and extend our understanding of the evidence for medical error disclosure, we sought to perform a narrative

review to identify and summarize the preferences and perceptions of medical error disclosure among patients that have lower educational attainment, are older, and/or are persons of color.

## **METHODS**

We worked with a clinical librarian (JBW) to design and conduct a comprehensive search for articles in PubMed on January 25, 2021. We did not limit by date because the field of medical error disclosure is relatively new, and thus we have the opportunity to examine the literature comprehensively. We chose to limit our search to PubMed to focus on the studies that most directly inform clinical practice. The studies that inform current guidelines around medical error disclosure are found in PubMed, and we aimed to determine whether these studies are inclusive of marginalized populations. We did, however, check the reference lists of included studies but did not identify studies that met our inclusion criteria. We used keywords and controlled vocabulary for our search strategy, including MeSH terms, for each concept of our research question, namely the disclosure of medical errors. We developed the search strategy using an iterative process whereby the study team examined results for each search term and eliminated terms that produced irrelevant results. We reported our results according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Our complete search strategy can be found in Appendix Table 1. We managed our records with Covidence (Melbourne, Australia).<sup>25</sup>

### **Inclusion Criteria**

We included studies available in English that included patients as study participants and aimed to determine patients' preferences and/or perceptions about error disclosure in urban, high-income

countries (as defined by the World Bank) among marginalized populations. We chose to include studies that examined both preferences and perceptions of medical error disclosure as preferences are influenced by an individual's perception, familiarity, and/or knowledge.<sup>26</sup> For example, a patient's perception of the quality of a prior health care visit may influence their preferences for future health care delivery. While adverse events occur in low and middle-income countries, they face unique challenges in the context of limited health infrastructure and resources.<sup>27-29</sup> We first defined marginalized by any one of the following three characteristics: older age (mean age > 65 years); lower educational attainment (> 60% high school education or less); and/or non-white race/ethnicity (< 50% non-Hispanic white for US studies).<sup>30</sup> We consider older adults aged  $\geq 65$  years as a marginalized population as they are a medically complex patient population and experience patient safety incidents at a higher rate than younger adults.<sup>31,32</sup> Older patients are more likely to have multiple chronic diseases, including dementia, cancer, heart disease, osteoporosis and hip fracture, kidney failure, and diabetes,<sup>33</sup> which can lead to disability and high utilization of health care services, including increased hospital stays.<sup>34</sup> In addition, older adults aged  $\geq 65$  years are more likely to be frail, which put them at risk of decreased functional status and quality of life. We broadened our inclusion criteria for educational attainment (> 55% high school education or less) and those from racial and ethnic minority groups (< 55% non-Hispanic white for US studies) to include more studies. Studies with a sub-sample of our target population were also eligible.

### **Exclusion Criteria**

We excluded studies in non-English languages, studies without full text, or without primary data. We also excluded studies if their study population did not focus on marginalized participants, as



defined above. We decided to exclude studies that did not have a predominantly marginalized patient population because marginalized populations experience a wide range of patient safety issues, as identified in a prior review,<sup>35</sup> and are less likely to be included in research studies. When marginalized populations are included, the sample size is often too small to draw meaningful conclusions about the relationship between a health outcome (e.g., preferences for error disclosure) and specific demographic characteristics, such as race/ethnicity.<sup>36</sup> This may lead to greater disparities in patient safety, as a lack of racial/ethnic representation among study participants may skew findings related to patients' preferences for medical error disclosure. In addition, we excluded pediatric studies, studies that presented single case reports, and studies that did not focus on outcomes around patients' preferences or perceptions of medical error disclosure. We also excluded grey literature.

### **Study Selection**

Three reviewers (KO, KW, MS) conducted the initial screening based on title and abstract to determine if articles met the inclusion criteria for full-text review. The three reviewers resolved disagreements through discussion until they reached a consensus. Two reviewers (KO, KW) doubled-screened the remaining studies in full-text form. All reviewers separately screened and met weekly to reach a consensus, with both reviewers determining the final inclusion for analysis. For studies in which the description of the study participants or intervention was not presented in enough detail to determine inclusion, we contacted the study authors to elicit details that would guide whether the study should be included. During the full-text screen, we contacted 28 study authors to request more information about their study population to determine inclusion; we contacted authors two times and received responses from 13 authors.

## **Data Extraction**

We created a standardized form (Covidence, Melbourne, Australia) to extract data in the following areas: (1) setting, (2) study design, (3) study participants, (4) characteristics of the intervention, and (5) study findings. Two reviewers (KO and KW) completed data extraction through the double data extraction method, whereby both reviewers independently extract data from each study, meet to compare assessments, and reconcile disagreements through discussion, if necessary.<sup>37</sup> To facilitate comparison between studies, two authors (KO and KW) created categories to describe the intervention components of included studies.

## **Critical Appraisal**

We reviewed each study using the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement, a set of guidelines to improve the quality of reporting of observational studies.<sup>38,39</sup> The STROBE Statement has a 22-item checklist to ensure transparent reporting of observational studies. We indicated whether a study reported on each item with 'Yes,' 'No,' or 'NA' (for not applicable to the study being assessed). Two reviewers completed the STROBE checklist for two studies before independently assessing the remaining studies for reporting quality. We reached a consensus through discussion.

## **RESULTS**

The literature search yielded 3,050 articles. After removing duplicates, we screened 3,048 articles for inclusion based on title and abstract. We assessed the full text of 1,092 articles for

eligibility, and we eliminated 1,086 articles based on previously established inclusion and exclusion criteria. We included six articles<sup>36,40-44</sup> in the final analysis (Figure 1).

### **Design of Included Studies**

Table 1 presents the characteristics of the six included studies. Studies were conducted in the United States (5) and Switzerland (1) and published between 2002 and 2021. Four studies presented hypothetical scenarios to participants,<sup>36,41,42,44</sup> one study conducted focus groups,<sup>43</sup> and one study conducted a survey.<sup>40</sup> Three studies met our race/ethnicity criterion, and three studies met our educational attainment criterion. None of the studies met our age inclusion criterion.

Four studies sought to characterize patients' *preferences* for medical error disclosure,<sup>36,40,41,43</sup> while two of the studies aimed to understand factors (e.g., staff responsiveness or provider communication) that influence patients' *perceptions* of an adverse event.<sup>42,44</sup>

Four studies included hypothetical scenarios or vignettes of disclosure followed by a survey to further assess participants' thoughts and opinions about disclosure. The hypothetical scenarios and vignettes described various adverse events, such as delayed and missed diagnosis,<sup>41,44</sup> medication overdose,<sup>42,44</sup> and the severity of the medical error.<sup>36</sup> Studies presented between one to four scenarios or vignettes to participants. Further details of study design characteristics are described in Table 2.

### **Preferences for Error Disclosure**

Overall, in studies involving vignettes or hypothetical scenarios, participants preferred that medical errors be disclosed to them.<sup>36,41,42,44</sup>

Antunez et al. conducted telephone interviews using two hypothetical medical error scenarios, first when a primary care provider failed to order a biopsy after a mammogram and discovered their error, also known as self-discovered errors; and second, when another physician discovers the primary care provider at another health system failed to order the biopsy after a patient was seen for a mammogram, also known as an intersystem medical error discovery (IMED).<sup>41</sup> Participants did not differentiate between self-discovered medical errors and IMEDs and preferred disclosure regardless of how the error was discovered.<sup>41</sup> However, in cases where the hypothetical medical error did not affect a participant's health or well-being, some participants expressed that physicians need not disclose minor medical errors (e.g., ordering duplicate or unnecessary lab tests).<sup>41</sup> In addition, in terms of trust, in IMED errors, participants would gain more trust in the disclosing physician and lose trust in the physician who made the hypothetical error.<sup>41</sup> The majority of participants agreed that physicians are honest with their patients, but also felt that they would lose their trust in their physician if they made an error and were not informed about the mistake.<sup>41</sup> For age, younger participants were more likely to report that the amount of time elapsed between an error and disclosure was a factor that would influence the type of actions they would take (e.g., taking legal action, changing physicians, confronting the responsible physician) after learning of disclosure.<sup>41</sup> Younger and more educated participants were also more likely to seek more information about the error following the disclosure process. Participants with a college education were more likely to report that the physician's demeanor and behavior would affect the actions they would likely take after learning of an error.

A study conducted by Hobgood et al. published in 2002 used a 12-item survey to assess patient and family preferences for error management in the emergency department (ED). The majority of the 258 adult patients surveyed in the ED felt that if a medical error occurred in the course of their care, they would want to know everything about the error.<sup>40</sup> In addition to valuing honesty in physicians, participants surveyed also believed that medical educators should focus on teaching students to be honest physicians.<sup>40</sup> The authors used a chi-square test to assess for differences in patient preferences but found that age, race, and educational status did not impact patient responses to the survey. However, for age, the authors found that older participants preferred that an error be disclosed to them once all information was known, even if more time elapsed between the event and disclosure.<sup>40</sup>

A more recent study by Hobgood et al. used vignettes to assess how the level of error severity (i.e., no relief, prolonged suffering, near-death experience, imminently fatal) influences patient preferences for disclosure.<sup>36</sup> Overall, the majority of participants (98%) reported that they would want their doctor to tell them that a mistake occurred. However, less than half of the participants (45%) reported that they would want the mistake reported to a disciplinary organization. To determine how disclosure preferences differed by patient characteristics, the authors performed Somers' D for their analysis. When examining race/ethnicity, the authors only included participants who indicated their race/ethnicity as "White" or "African American" due to the small sample size. They did not find a meaningful difference in preference in this racial group comparison. However, when the authors looked at differences by age, they found that participants aged older than 55 years were less likely to report the hypothetical error to a

disciplinary body (40%) compared to participants aged between 21 and 30 years (54%).<sup>36</sup>

Participants without a high school education were more likely to report the error to a disciplinary body (60%) compared with those with a high school education (44%) and those with a college education (43%).<sup>36</sup>

Schneider et al. conducted six focus groups to assess how patients would like to learn about medical errors, including preferences for a patient notification letter.<sup>43</sup> The authors found that the majority of participants preferred that a member of the health care team inform the patient who was harmed through phone, mail, email, or face-to-face.<sup>43</sup> Participants also preferred that a letter to the patient have an empathetic tone and describe corrective actions, course of action for the patient, medical coverage, and the reason for the incident.

### **Perceptions of Error Disclosure**

Cleopas et al. presented a medication error scenario to examine the effects of three factors: staff responsiveness to error (i.e., slow or rapid), disclosure of error (i.e., yes or no), and the consequences of the error (i.e., minor or serious) on patients' perceptions of error disclosure.<sup>42</sup>

Most participants perceived the medication error as "bad" or "very bad" and unsafe, and a quarter of participants stated that they would not recommend the hospital.<sup>42</sup> The more undesirable factors that were present in the scenario (e.g., slow responsiveness to error, non-disclosure, serious consequences), the more likely participants would negatively perceive the scenario.<sup>42</sup> Younger patients were more likely to rate the care the hypothetical patient received as "bad" and unsafe and were less likely to recommend the hospital following the error scenario.<sup>42</sup>

Wu et al. showed participants three video vignettes that depicted physicians disclosing adverse events.<sup>44</sup> The authors created different versions of each vignette to portray variations in the extent of the physician's apology (full, non-specific, none) and the physician's acceptance of responsibility (full, none).<sup>44</sup> When participants viewed a scenario where a physician gave a full apology and accepted full responsibility, participants perceived the disclosure more positively, in terms of handling of the disclosure, perceptions, trust of the physician, and preference for the physician as their provider.<sup>44</sup> Participants were more likely to trust the physician who gave a sincere apology and accepted responsibility compared to physicians who gave an incomplete apology or no apology or acceptance of responsibility at all.<sup>44</sup> The authors found that older participants were more likely to have a negative emotional response (e.g., upset, frustrated, angry) to a hypothetical scenario adverse event (odds ratio [OR = 1.2; 95% confidence interval [CI] (1.02–1.42)], compared to younger patients.<sup>44</sup> Having a college education was associated with higher ratings of handling the incident and positive perception of the physician.<sup>44</sup>

### **Assessment of Reporting Quality**

We assessed the reporting quality of the six studies using the STROBE checklist (Appendix Table 2). Overall, we found that all six studies reported on the same 16 items following the STROBE guidelines. The most common items missing from studies were related to reporting of methods and results. Four studies did not report on methods to address bias (Item 9); four studies did not report on methods to address missing data (Item 12c); five studies did not provide reasons for non-participation (Item 13b). Although the STROBE checklist is not intended to be a methodological assessment tool, studies that adequately report can aid researchers in critically appraising research findings.

## **DISCUSSION**

In this narrative review, we identified and summarized the evidence for medical error disclosure preferences and perceptions of participants from a predominantly marginalized population (i.e., people of color, older patients, and those with lower educational attainment). To our knowledge, this is the first review to examine the disclosure and investigation of adverse events among marginalized populations. We found a limited number of relevant articles that met our inclusion criteria for marginalized populations in their study, even after broadening our inclusion criteria. We found only three studies that met our inclusion criteria based on race/ethnicity; three met our inclusion criteria based on educational attainment. No studies met our inclusion criteria based on age. None of the six studies investigated medical error disclosure in real-world settings; all studies asked participants to weigh in on hypothetical scenarios. As such, it was not possible to evaluate medical error disclosure from the lived experiences of marginalized patient populations. To better understand the generalizability of error disclosure practices, increasing the representation of marginalized populations must remain a priority for future researchers.

Across the six studies, we found that older patients, those from marginalized racial/ethnic groups, or those with lower educational attainment prefer to have medical errors disclosed to them by a provider who apologizes fully and takes responsibility for the mistake. These findings align with previous studies that investigated the preferences of younger patients, white patients, and more educated patients.<sup>9,11,18</sup> The limited evidence derived from six studies testing hypothetical disclosure scenarios suggests that existing disclosure recommendations may be appropriate for a wide range of patients, despite the homogeneity of the evidence on which these



recommendations are based. However, future studies should further examine differences in race/ethnicity, age, and educational attainment.

Although patients from marginalized racial/ethnic groups appear to have similar preferences for disclosure as white patients, there may be disparities in how healthcare providers approach and/or conduct medical error disclosure for patients of color. Studies on disclosure highlight the importance of patient-clinician trust.<sup>9,11,18</sup> Given the trust<sup>45</sup> and trustworthiness<sup>46</sup> gaps for marginalized populations, we would expect differences in patient experiences related to experiencing a medical error. Observational studies of communication-and-resolution programs among these patients would address this unanswered question.

## **Limitations**

Our review had some limitations. Most of the studies we included in this review used hypothetical scenarios and vignettes to elicit patients' preferences and/or perceptions of medical error disclosure. Further research is needed to examine the extent to which participants' responses to hypothetical scenarios and vignettes are related to their responses to real-life cases of medical error disclosure. We included one database (PubMed), as we felt that relevant studies would be included in the indexed, peer-reviewed medical literature. In this process, we may have missed relevant articles included in other databases. We also may have missed relevant articles that did not report patient demographics; however, attempts were made to contact authors for missing information. Additionally, we could not obtain the full text for some articles; therefore, potentially relevant articles may have been excluded. The small number of studies included in our review does not allow for the generalizability of these findings. In this review, most of the

studies lacked a multivariable regression analysis to examine the relationship between race/ethnicity, age, and educational attainment. The studies that did use a regression analysis examined race/ethnicity in aggregate or excluded some racial/ethnic groups from their analysis due to the small sample size.<sup>36,44</sup>

## **CONCLUSIONS**

We performed the first narrative review specifically focused on medical error disclosure preferences and perceptions of patients who are from predominantly marginalized populations (racial/ethnic minority, older patients, and patients that have lower educational attainment). We found that these patients reported preferences for error disclosure that were similarly reported in studies with patients who are predominantly white and have high levels of educational attainment.<sup>11,15,18</sup> While these studies met our criteria for inclusion of marginalized populations, future studies should aim to examine differences in error disclosure preferences across race/ethnicity, educational attainment, and age. Due to the variability in study design, such as the different types of hypothetical medical errors in each study, it was not possible to provide direct comparisons across studies. Future research should focus on determining comparable hypothetical scenarios to allow for cross-study comparisons. Further studies should investigate how hypothetical medical error disclosure scenarios and vignettes relate to real-world experiences of medical error disclosure among these patient populations and current disclosure practices in studies where marginalized populations receive health care.

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**Table 1. Study and Participant Characteristics of Included Studies**

Study Author	Year	Location	Study design	Sample size (N)	Age in years (mean)	Participants from racial/ethnic minority groups (%)	≤ HS education (%)
Antunez et al. <sup>41</sup>	2021	United States	Vignettes + Telephone interviews	30	46	<b>20% Black, 10% Hispanic/Latino, 10% Asian/Asian American, 3% Pacific Islander, 7% American Indian/Alaska Native, 7% Middle Eastern, 17% Other</b>	7%
Cleopas et al. <sup>42</sup>	2006	Switzerland	Scenario + Survey	1274	54	non-US study	<b>70.3%</b>
Hobgood et al. <sup>40</sup>	2002	United States	Survey	258	16% > 60*	22% African American, 2.4% Hispanic, 2% Other	<b>63%</b>
Hobgood et al. <sup>36</sup>	2008	United States	Vignette + Survey	394	29% > 55*	23.8% Black, 75.7% White	<b>56%</b>
Schneider et al. <sup>43</sup>	2013	United States	Focus groups	53	54.9	<b>22.6% African American, 20.8% Hispanic, 13.2% Asian, 7.6% Other/multiracial</b>	NR
Wu et al. <sup>44</sup>	2009	United States	Video vignettes + survey	200	2% > 60*	<b>80% Black/African American, 1% Hispanic/Latino, 4% Native American, 1% Other</b>	50%

**Bold** text indicates the study met inclusion criteria for a marginalized population.

\* Authors reported the percentage.

HS, high school; NR, not reported.

**Table 2. Design Characteristics of Included Studies**

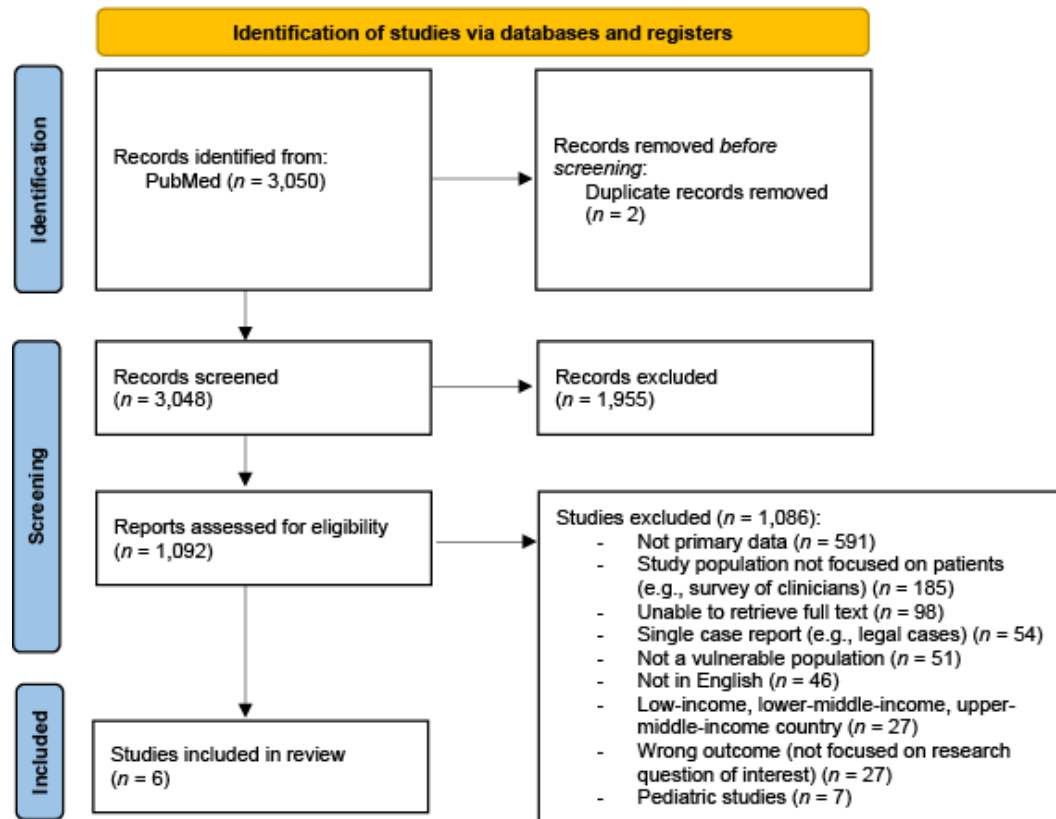
Author, year	Study design	Measures Included				Setting (clinical or non-clinical)	Error being evaluated: type of error and its impact (type of harm, severity, etc.)
		Preferences for error disclosure	Perceptions of error disclosure	Evaluation of group differences	Evaluation of trust		
Antunez et al. 2019 <sup>41</sup>	Vignettes and Telephone Interviews	x	NR	x	x	Unclear	Two hypothetical scenarios describing: 1. when a physician discovers their own error, i.e., the self-discovered scenario (failure to order a biopsy as recommended after a mammogram) 2. when a physician discovers an error made by another physician in another health system, i.e., the IMED scenario (patient discovers a breast mass during a self-exam and self-refers to a specialist, who then discovers the primary care physician's prior error)
Cleopas et al. 2006 <sup>42</sup>	Scenario and Survey	NR	x	x	NR	Clinical; Geneva University Hospitals, a public hospital system in Geneva, Switzerland.	Hypothetical scenario describing a medication overdose. Three experimental factors were studied: 1. staff responsiveness to error (ineffective and slow vs. effective and fast) 2. disclosure of the error (non-disclosure vs. full disclosure and apology) 3. consequences for the patient (serious vs. minor)
Hobgood et al. 2002 <sup>40</sup>	Survey	x	NR	x	x	Clinical; Tertiary care hospital ED	12-item survey assessing four areas of patient and family preference for error management in the ED: 1. completeness of disclosure 2. timing of disclosure 3. threshold for reporting to hospital committees, state medical boards, or government agencies 4. the role of medical educators in teaching students how to deal with medical error
Hobgood et al. 2008 <sup>36</sup>	Vignettes and Survey	x	NR	x	NR	Clinical; Tertiary care academic emergency department	Four vignettes portraying a range in severity of consequences: (a) no relief, (b) prolonged suffering, (c) near death experience, and (d) imminently fatal  Error severity was determined by first asking the participant if the scenario portrayed an error, and then asking the participant to



							categorize the error as minor, moderate, or severe
Schneider et al. 2013 <sup>43</sup>	Focus Groups	x	NR	x	NR	Non-clinical; Market research facility	Focus group scripts included three sections: 1. preferences for receiving health information 2. knowledge of safe injection practices 3. responses to and preferences for a patient notification letter
Wu et al. 2009 <sup>44</sup>	Video Vignettes and Survey	NR	x	x	x	Unclear	Vignettes depicted three adverse events: 1. a year-long delay in noticing a malignant-looking lesion on a mammogram 2. a chemotherapy overdose ten times the intended amount 3. a slow response to pages by a pediatric surgeon for a patient who eventually codes and is rushed to emergency surgery

IMED, intersystem medical error discovery; NR: not reported; ED, emergency department.

**Figure 1.** Shown here is the PRISMA flowchart of studies included in the review.



## Appendix Table 1. Search strategy.

Search was conducted on January 25, 2021. No date or language limits were used.

Database	Search strategy	Number of Results
PubMed	(error[tiab] OR errors[tiab] OR "Medical Errors"[Mesh] OR "Iatrogenic Disease"[Mesh] OR "adverse events"[tiab] OR "adverse event"[tiab] OR "communication and resolution"[tiab])  AND  ("communication and resolution"[tiab] OR "Truth Disclosure"[Mesh] OR disclosure[tiab] OR disclose[tiab] OR disclosed[tiab] OR discloses[tiab] OR apology[tiab] OR apologies[tiab] OR "open communication"[tiab])	3050

Appendix Table 2. Reporting quality of included studies using STROBE checklist

Item number	Recommendations	Antunez 2019	Cleopas 2006	Hobgood 2002	Hobgood 2008	Schneider 2013	Wu 2009
1a	Abstract: Indicate the study's design with a commonly used term in the title or the abstract	Yes	Yes	Yes	Yes	Yes	Yes
1b	Abstract: Provide in the abstract an informative and balanced summary of what was done and what was found	Yes	Yes	Yes	Yes	Yes	Yes
2	Introduction: Explain the scientific background and rationale for the investigation being reported	Yes	Yes	Yes	Yes	Yes	Yes
3	Introduction: State specific objectives, including any prespecified hypotheses	Yes	Yes	Yes	Yes	Yes	Yes
4	Methods: Present key elements of study design early in the paper	Yes	Yes	Yes	Yes	Yes	Yes
5	Methods: Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	Yes	Yes	Yes	Yes	Yes	Yes
6	Methods: Cross-sectional study—Give the eligibility criteria, and the sources and methods of selection of participants	Yes	Yes	Yes	Yes	Yes	Yes
7	Methods: Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Yes	Yes	Yes	Yes	Yes	Yes
8	Methods: For each variable of interest, give sources of data and details of methods of assessment (measurement).	Yes	Yes	Yes	Yes	Yes	Yes

	Describe comparability of assessment methods if there is more than one group						
9	Methods: Describe any efforts to address potential sources of bias	Yes	No	No	No	No	Yes
10	Methods: Explain how the study size was arrived at	NA	No	No	No	NA	Yes
11	Methods: Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	NA	Yes	Yes	Yes	Yes	Yes
12a	Methods: Describe all statistical methods, including those used to control for confounding	NA	Yes	Yes	Yes	Yes	Yes
12b	Methods: Describe any methods used to examine subgroups and interactions	No	Yes	Yes	Yes	Yes	Yes
12c	Methods: Explain how missing data were addressed	No	No	Yes	Yes	No	No
12d	Methods: Cross-sectional study—If applicable, describe analytical methods taking account of sampling strategy	No	No	No	No	No	No
12e	Methods: Describe any sensitivity analyses	NA	NA	NA	NA	NA	NA
13a	Results: Report numbers of individuals at each stage of study—e.g., numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analyzed	Yes	Yes	Yes	Yes	Yes	Yes
13b	Results: Give reasons for non-participation at each stage	No	Yes	No	No	No	No

13c	Results: Consider use of a flow diagram	No	No	No	No	No	No
14a	Results: Give characteristics of study participants (e.g., demographic, clinical, social) and information on exposures and potential confounders	Yes	Yes	Yes	Yes	Yes	Yes
14b	Results: Indicate number of participants with missing data for each variable of interest	No	Yes	No	No	No	No
15a	Results: Cross-sectional study—Report numbers of outcome events or summary measures	Yes	Yes	Yes	Yes	Yes	Yes
16a	Results: Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g., 95% confidence interval). Make clear which confounders were adjusted for and why they were included	NA	Yes	NA	Yes	NA	Yes
16b	Results: Report category boundaries when continuous variables were categorized	NA	Yes	Yes	Yes	NA	Yes
16c	Results: If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA	NA	NA	NA	NA	NA
17	Results: Report other analyses done—e.g., analyses of subgroups and interactions, and sensitivity analyses	No	Yes	Yes	Yes	No	Yes
18	Discussion: Summarize key results with reference to study objectives	Yes	Yes	Yes	Yes	Yes	Yes
19	Limitations: Discuss limitations of the study, taking into account sources of potential bias or imprecision.	Yes	Yes	Yes	Yes	Yes	Yes

	Discuss both direction and magnitude of any potential bias						
20	Interpretation: Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	Yes	Yes	Yes	Yes	Yes	Yes
21	Generalizability: Discuss the generalizability (external validity) of the study results	Yes	Yes	Yes	Yes	Yes	Yes
22	Other information: Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Yes	Yes	NA	Yes	NA	Yes