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Relationship Between Patients' Perceptions of Care Quality and Health Care Errors in 11 Countries: A Secondary Data Analysis

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Patients may be the most reliable reporters of some aspects of the health care process; their perspectives should be considered when pursuing changes to improve patient safety. The authors evaluated the association between patients' perceived health care quality and self-reported medical, medication, and laboratory errors in a multinational sample. The analysis was conducted using the 2010 Commonwealth Fund International Health Policy Survey, a multinational consumer survey conducted in 11 countries. Quality of care was measured by a multifaceted construct developed using Rasch techniques. After adjusting for potentially important confounding variables, an increase in respondents' perceptions of care coordination decreased the odds of self-reporting medical errors, medication errors, and laboratory errors ($P < .001$). As health care stakeholders continue to search for initiatives that improve care experiences and outcomes, this study's results emphasize the importance of guaranteeing integrated care.

Key words: laboratory error, medical error, medication error, quality of care

Over the last decade, patient safety has gained attention in the United States and internationally. The Institute of Medicine (IOM) defined patient safety as "the prevention of harm to patients from the care that is intended to help them."[1(p5)] Safety is an essential component of delivering quality care and a fundamental principle of patient-centered care.[2,3] To ensure patient safety, health care delivery should prevent errors, learn from the errors that occur, and be built on a culture of safety that involves health care professionals, organizations, and patients.[2]

Patient safety obtained widespread acknowledgment after the IOM reported an estimate of 44 000 to 98 000 deaths as the result of medical errors in 1997.[4] A subsequent report indicated that medication errors injure at least 1.5 million people annually in US hospitals.[1] In 2008, a study estimated that the annual cost of the harm produced by medical errors amounted to $17.1 billion.[5] In 2004, the World Health Organization recognized the importance of patient safety by launching a coalition to enable the development of patient safety policies and best practices in its member states. Despite efforts to improve patient safety, multinational surveys show patients remain concerned about their safety.[6,7] Multiple organizations in the United States and abroad recognize that patients should be engaged in patient safety initiatives.[8-10] However, little attention has been paid to patients' voice and their experience and expertise remain neglected.[11]

The IOM identified patient-centeredness as an essential component for delivering quality care. Thus, initiatives that acknowledge and respect patients' needs, preferences, and values need to be part of any quality management program.[2] Patients may be the most reliable reporters of some aspects of the health care process; their perspectives should be considered when pursuing changes to improve patient safety.[12] The literature has shown that patients may interpret lapses in care quality as risks to their safety. Studies examining factors that influence patients' error reports found coordination of care to be a strong predictor.[13,14] Quality of care from patients' perspective involves other dimensions such as access to and continuity of care. The relationship between these dimensions and patient error reporting requires further investigation.

The purpose of this study was to evaluate the association between patients' perceived health care quality and self-reported medical, medication, and laboratory errors in a multinational sample of 11 countries, as measured from survey data from the 2010 Commonwealth Fund (CWF) International Health Policy Survey.[15] External factors influencing patients' perceptions of safety may involve characteristics that affect patients' experiences with health care other than the technical

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aspects of care delivery.[16] In light of the available data, this investigation assessed characteristics pertaining to 4 of the 7 analytic dimensions proposed by Gerteis:[17] (1) respect for patients' values, preferences, and expressed needs; (2) coordination and integration of care; (3) information, communication, and education; and (4) transition and continuity. In addition, it included access to care, which is another aspect of care quality assessed by patients not accounted for in the Gerteis framework for quality.[2]

METHODS

Data sources

This investigation was an analysis of data from the 2010 CWF survey. The CWF survey, which was conducted in 11 countries in 2010, consisted of a national representative sample of adults 18 years and older in Australia, Canada, France, Germany, Netherlands, New Zealand, Norway, Sweden, Switzerland, United Kingdom, and United States. The purpose of the CWF survey was to obtain insights about consumers' access to, costs of, and satisfaction with care experiences in an effort to provide comparable data across countries to monitor and compare health care systems.[18] Further information on data collection procedures is available elsewhere.[15]

Outcomes

This study sought to determine the odds of reporting a health-related error as a function of health care access and services. There were 3 dependent variables of interest: (1) self-reported medical errors; (2) self-reported medication errors; and (3) self-reported laboratory errors. The following dichotomous items from the 2010 CWF survey were used: (1) In the past 2 years, has a doctor, nurse, hospital, or pharmacist ever given you the wrong medication or wrong dose? (2) Was there a time you thought a medical mistake was made in your treatment or care? and (3) Have you been given incorrect results for a diagnostic or laboratory test?

Independent variables

Definitions adopted for the investigation are shown in Table 1. To create the primary independent variables, summary measures were created combining data from items assumed to measure each specific dimension of the health care quality construct (ie, coordination of care, access to care, communication to patients, respect for patients' preferences, and continuity of care) that were available in the 2010 CWF survey (Table 2). This study used dichotomous and polytomous Rasch procedures to estimate the primary independent variables based on the survey items because traditional composites scores, which are created from ordinal-level data, assume equal distances between ratings.[19] When there is good model fit, Rasch analysis transforms ordinal data into interval data by converting raw scores to the natural logarithm. This methodologic approach to create variables to be used as covariates or outcomes has been previously used in health outcomes measurement.[20-25] The variables obtained through Rasch analysis described the overall quality experience for each one of the subscales. Higher values on these variables represent more exposure to the construct assessed (ie, coordination of care). Continuous variables are deemed to better describe a construct than dichotomous variables.[24] An additional advantage of obtaining continuous variables through Rasch analysis is that it reduces the skewness of data, a common characteristic of composite measures.[21] Potential explanatory variables also considered for the analyses included age, sex, education, income (relative to each country's national average), medical services use, perceived health status, health care system type,[26] number of chronic conditions, number of prescription drugs, and cost barriers.

Data analysis

The procedure of estimating a person's ability (ie, the location of each person's logit scores for each quality subscale) was conducted with WINSTEPS software (version 3.71.0.1).[27] First, category frequencies and average measures were examined for each response

Table 1. Definitions Used for Quality-of-care Dimensions

Quality-of-Care Dimension	Definition
Access to Care	Patients' reported ability to approach, enter, and make use of needed health services.[2,17]
Communication of Care	Provision of technical and nontechnical information such as patients' goals, expectations, and preferences in which patients receive appropriate and complete information and the information is correctly understood.[17] Successful communication assures all medical- and medication-related practices are performed safely.[33]
Continuity of Care	Assuring that patients' health concerns are addressed once there is a change between health care settings such as hospitalization discharge to home care.[17]
Coordination of Care	Adequate communication among all specialty providers of patients' care, medical support services, and frontline practitioners. When coordination of care is accomplished, patients can identify who is in charge of their care at any point, receive consistent messages from their care team, and know whom to contact if help is needed.[17]
Providers' Respect for Patients' Preferences	Engaging patients in the decision-making process of treatments and medical procedures, acknowledging patients' individuality, considering the impact that a treatment might have on patients' quality of life, eliciting patients' needs and expectations from care, and understanding patients' abilities and limitations to partake in their own care.[17]

Table 2. Commonwealth Fund International Health Policy Survey Items Used for Assessing Each Quality-of-life Dimension

Access to Care (ATC) items
(ATC1) Is there "one doctor's practice, health center, or clinic you usually go to for most of your medical care?
(ATC2) Is there one "doctor" you usually see for your medical care at this place?
(ATC3) Is there a nurse or other clinical staff (other than a doctor) who is regularly involved with your health care?
(ATC4) Have you ever felt your time was wasted because it took you a lot of time to schedule specialist?
(ATC5) Have you ever felt your time was wasted because you were kept waiting a long time to see the doctor for a scheduled appointment?
Communication of Care (COM) items
(COM1) When you left the hospital, did someone discuss with you the purpose of taking each of your medications?
(COM2) In the past 12 months, has "doctor" or other staff at your regular place of care explained the potential side effects of any medication that was prescribed?
(COM3) In the past 12 months, has "doctor" or other staff at your regular place of care given you a written list of all your prescribed medications?
(COM4) In the past two years, when you received a new prescription medication, was there ever a time when you were not sure what it was for or when or how to take it?
Continuity of Care (CC) items
(CC1) When you left the hospital, did the hospital make arrangements or make sure you had follow-up visits with a doctor or other health care professional?
(CC2) When you left the hospital, did you receive written information on what to do when you returned home and what symptoms to watch for?
(CC3) In the past 12 months, has "doctor" or other staff at your regular place of care reviewed with you any medications you take, including those prescribed by other doctors?
Coordination of Care (COOR) items
(COOR1) Was there ever a time when test results or medical records were not available at the time of your scheduled medical care appointment?
(COOR2) Was there ever a time when you received conflicting information from different doctors or health care professionals?
(COOR3) Was there ever a time when doctors ordered a medical test that you felt was unnecessary because the test had already been done?
Have you experienced the following when seeing a specialist?
(COOR4) The specialist did not have basic medical information from your regular doctor about the reason for your visit or test results.
(COOR5) After you saw the specialist, the regular doctor did seem informed and up-to-date about the care you got from the specialist.
(COOR6) After your visit in the emergency department, did the doctors or staff at the place where you usually get medical care seem informed and up-to-date about the care you had received in the emergency department?
(COOR7) After your visit in the hospital, did the doctors or staff at the place where you usually get medical care seem informed and up-to-date about the care you had received in the hospital?
(COOR8) Have you ever felt your time was wasted because your care was poorly organized or poorly coordinated?
Providers' Respect for Patients' Preferences (PRPP) items
(PRPP1) When you need care or treatment, how often does the doctor or medical staff you see give you an opportunity to ask questions about recommended treatment?
(PRPP2) When you need care or treatment, how often does the doctor or medical staff you see spend enough time with you?
(PRPP3) When you need care or treatment, how often does the doctor or medical staff you see involve you as much as you want to be in decisions about your care and treatment?

option. Then, rating scale step calibrations and category fit statistics were assessed. Step calibrations should increase for at least 1.4 logits but no more than 5.0 logits.[27] Subsequently, the probability curve for each response category was examined. Each response category should exhibit a probability of at least 0.5 of being selected. Categories were collapsed to create uniform frequency distributions when the aforementioned requirements were not met. Furthermore, Infit and Outfit mean-square statistics (MNSQ) were evaluated. Appropriate values range between 0.6 and 1.4 for rating scale data[27] and between 0.8 and 1.3 for dichotomous data.[28] Finally, model reliability was also estimated. The person scores from the best-fitting model were used as independent variables in the subsequent analyses. All Rasch analyses were conducted using the sampling weights through the PWEIGHT command available on WINSTEPS. Exploratory bivariate analyses (eg, χ^2 tests, tests of correlations) between the dependent and independent and control variables were

conducted using the survey weights. Multivariate weighted logistic regressions were conducted with all independent variables and the control variables that showed relationship of significance ($P < .1$) in the exploratory analyses. A level of significance of .01 (2-tailed) was used to account for the large sample size. The statistical software STATA 11.0 was used to perform logistic regression analyses. Taylor series linearization was utilized to obtain variance estimates.

RESULTS

A total of 19 738 persons 18 years and older completed telephone interviews for the CWF survey in 11 countries. The response rates for each country varied from a high of 42% in Sweden to a low of 9% in the Netherlands. For this study, participants who qualified and answered any of the 3 items measuring the outcomes (ie, medical error, medication error, or laboratory error) were included in the analysis. After excluding respondents with missing data on the independent variables, the final study sample included 9872 persons. Demographic information of subjects included in this is study can be found in the Appendix (see Supplemental Digital Content, available at: http://links.lww.com/QMH/A4).

Development and assessment of the perceived quality-of-care independent variables

A total of 19 738 persons 18 years and older completed telephone interviews for the CWF survey in 11 countries. Several indicators were used to determine if the data fit the Rasch model. The weighted counts and percentages displayed in Table 3 for the Likert-type scale indicate that all 4 categories were fully used by the respondents because each category satisfied the criterion for minimum counts of 10 observations. The observed average measure for a category represents the average level of endorsement (eg, level of satisfaction) of the persons who selected that category. Table 3 shows that the observed average measures increased with the category values. The Infit and Outfit MNSQ for all 4 categories fell between the accepted ranges of 0.6 to 1.4, indicating a good fit to the structure of the rating scale. The category thresholds and category measures increase in ascending order, indicating that respondents were able to properly differentiate the ordinal scale configuration. Table 3 also displays the summary of category functioning parameters for the 4 dimensions with dichotomous response options. The Infit and Outfit MNSQ for the dichotomous response options in all but the Communication of Care dimension fell within accepted ranges, indicating good fit to the dichotomous scale structure. A second Rasch analysis was conducted after reviewing the fit statistics of each one of the items in the Communication of Care dimension, which resulted in the deletion of the item "There was a time when you received a new prescription medication, and were not sure what it was for or when or how to take it." After this second analysis, the Outfit MNSQ improved for the dichotomous scale from to 2.00 to 1.09.

Item quality was assessed using the item fit statistics. Table 4 displays the item fit statistics for each item in the 5 dimensions. "Measure" corresponds to the estimation of the item difficulty or "difficult to endorse" parameter. This represents the location of an

Table 3. Summary of Category Structure for Ordinal and Dichotomous Items

Dimension/# Items	Rating Category	Observed Count (%)	Observed Average	Infit MNSQ	Outfit MNSQ	Andrich Threshold	Category Measure
Providers' Respect for Patients' Preferences/3 items	1 = Rarely or never	2 466 (5)	−1.16	1.18	1.17	N/A	2.88
	2 = Sometimes	4 585 (9)	−0.21	0.84	0.80	−1.63	−0.97
	3 = Often	10 153 (20)	1.26	0.88	0.91	−0.20	0.89
	4 = Always	33 574 (66)	2.01	1.11	1.08	1.83	3.02
						Coherence	
						M → C[a]	C → M[b]
Access to Care/5 items	0 = No	24 044 (27)	−0.63	0.97	0.82	76%	65%
	1 = Yes	66 377 (73)	1.88	1.03	1.28	84%	90%
Continuity of Care/3 items	0 = No	5 650 (33)	0.00	1.00	0.99	61%	49%
	1 = Yes	11 598 (67)	0.35	1.00	1.01	63%	74%
Communication of Care/4 items	0 = No	10 539 (27)	−1.34	0.96	2.00	84%	84%
	1 = Yes	29 035 (73)	1.84	0.90	0.94	87%	87%
Coordination of Care/8 items	0 = No	16 203 (16)	0.16	1.00	0.99	67%	41%
	1 = Yes	84 192 (84)	1.18	1.01	1.01	76%	90%

Abbreviations: MNSQ, mean-square statistics; N/A, not applicable.
[a]M → C = measure implies category.
[b]C → M = category implies measure.

Table 4. Items Statistics for the Quality-of-care Dimensions

Dimension Items[a]	Measure (Logits)	SE	Infit MNSQ	Outfit MNSQ	P-M Correlation
Access to Care (ATC) items					
ATC3	2.89	0.02	1.13	1.54	0.59
ATC5	0.18	0.02	0.93	0.90	0.60
ATC4	−0.54	0.02	0.92	0.86	0.55
ATC2	−0.87	0.03	1.102	1.04	0.41
ATC1	−1.66	0.03	1.102	0.60	0.49
Communication of Care (COM) items					
COM3	2.58	0.04	1.01	1.07	0.73
COM2	0.54	0.03	0.74	0.72	0.77
COM1	−0.62	0.06	1.08	1.23	0.52
COM4	−2.50	0.05	1.14	2.84	0.20
Continuity of Care (CC) items					
CC3	0.13	0.06	1.15	1.15	0.83
CC2	0.05	0.05	0.96	0.96	0.74
CC1	−0.19	0.05	0.93	0.93	0.73
Coordination of Care (COOR) items					
COOR6	0.93	0.04	1.14	1.17	0.57
COOR5	0.48	0.03	1.03	1.02	0.60
COOR2	0.46	0.02	0.96	0.97	0.66
COOR8	−0.01	0.03	0.97	0.97	0.62
COOR7	−0.16	0.05	1.00	0.97	0.57
COOR4	−0.34	0.04	0.99	0.95	0.55
COOR1	−0.65	0.03	0.98	0.97	0.56
COOR3	−0.71	0.03	1.03	1.07	0.53
Providers' Respect for Patients' Preferences (PRPP) items					
PRPP2	0.30	0.02	1.03	1.02	0.84
PRPP3	0.02	0.02	0.97	0.95	0.84
PRPP1	−0.32	0.02	0.99	0.96	0.82

Abbreviations: MNSQ, mean-square statistics; P-M, point-to-measure correlation; SE, standard error.
[a]Refer to Table 2 for item description.

item along the latent trait continuum; the greater the value of item difficulty, the lower the probability of the item being endorsed. Infit and Outfit MNSQ range of 0.6 to 1.4 is considered appropriate. In the Access to Care dimension, the item with the lowest measure was "Have one regular practice to obtain medical care." This means that respondents were less likely to agree with this item. The hardest item to agree with was "There is existence of clinical staff (other than a doctor) involved in my health care." For this item, the Outfit MNSQ is above the accepted range (>1.4), which means that it may be collecting some error. However, this item was retained in the model because the Infit MNSQ and the correlation values are within acceptable ranges.

Evidence showed that the item "The patient received a new prescription medication, and was not sure what it was for or when or how to take it" did not function optimally as an assessment in the Communication of Care dimension. The Outfit MNSQ exceeded the 1.4 threshold level. Moreover, the Outfit statistics surpassed 2, which suggests that the item may distort or degrade the measurement system. In addition, the item correlated poorly (0.2) with the other items in this dimension. Although respondents were more likely to endorse this item, it may not be part of the same construct. For these reasons, this item was excluded from the model. Examination of the results indicates that all items for both dimensions Coordination of Care and Providers' Respect for Patients'

Preferences dimensions met all criteria of the Rasch model. Finally, the person reliability indexes for the sample were below the minimum accepted (0.6) for all dimensions (data not shown). This suggests that the items do not appear to be working properly to distinguish higher versus lower levels of perceived quality of care.

Relationship between patients' perceived health care quality and self-reported medical, medication, and laboratory errors

The second stage of the analysis in this study consisted of establishing the relationship between patients' perceived health care quality and self-reported medical, medication, and laboratory errors. For this, logistic regression models were built using the Rasch quality-of-care scores for each dimension (ie, independent variables) and self-reported medical errors, self-reported medication errors, and self-reported laboratory errors (ie, dependent variables). Initially, age, sex, education, income, medical services use, perceived health status, health care system type, number of chronic conditions, number of prescription drugs, and costs barriers were included in the models to control for potential confounding. However, variables not found to be significant in bivariate analyses were removed from the final models (Table 5).

It can be seen from the data in Table 5 that after controlling for relevant predictors, 4 dimensions of quality of care as perceived by patients—Access to Care (odds ratio [OR] = 0.99; 99% confidence interval [CI], 0.90-1.09), Care Continuity (OR = 1.05; 99% CI, 0.91-1.23), Communication of Care (OR = 0.95; 99% CI, 0.87-1.04), and Respect for Patients' Preferences (OR = 0.94; 99% CI, 0.88-1.01)—were not statistically significantly associated with patients' self-reporting medical errors. As Table 5 shows, Coordination of Care was statistically significantly associated with self-reported medical errors (OR = 0.60; 99% CI, 0.55-0.67). This means that an increase in the perceived level of Coordination of Care decreases the likelihood of patients' self-reporting medical errors, holding all other predictors constant. Similarly, Coordination of Care was statistically significantly associated with the self-reported

Table 5. Weighted Adjusted Logistic Regression Results for Relationship of Quality of Care And Self-reported Medical, Medication, and Laboratory Errors

	Weight Logistic Regression Model		
Quality-of-Care Dimension	**Self-reported Medical Errors,[a] OR (99% CI)**	**Self-reported Medication Errors,[b] OR (99% CI)**	**Self-reported Laboratory Errors,[c] OR (99% CI)**
Access to Care	0.99 (0.90-1.09)	1.02 (0.91-1.12)	0.98 (0.84-1.14)
Continuity of Care	1.05 (0.91-1.23)	1.01 (0.86-1.18)	1.00 (0.80-1.26)
Communication of Care	0.95 (0.87-1.04)	0.93 (0.85-1.02)	1.01 (0.89-1.16)
Coordination of Care	0.60 (0.55-0.67)[d]	0.75 (0.67-0.85)[d]	0.61 (0.54-0.70)[d]
Respect for Patients' Preferences	0.94 (0.88-1.01)	0.95 (0.87,1.02)	0.93 (0.84-1.02)
Age			
30-49 y (vs 18-29 y)	0.68 (0.43-1.08)	0.55 (0.33-0.92)	1.06 (0.56-2.01)
50-64 y (vs 18-29 y)	0.51 (0.31-0.83)	0.38 (0.22-0.66)	0.92 (0.46-1.83)
65+ y (vs 18-29 y)	0.41 (0.28-0.61)	0.34 (0.25-0.69)	0.62 (0.30-1.28)
Perceived health status			
Good (vs very good)	1.37 (1.07-1.76)	1.51 (1.05-2.16)	0.93 (0.57-1.51)
Fair/poor (vs very good)	2.13 (1.63-2.79)	1.90 (1.26-2.87)	1.10 (0.64-1.86)
Number of doctors seen			
1 (vs none)	1.93 (0.87-4.25)	0.94 (0.37-2.38)	1.64 (0.54-4.87)
≥2 (vs none)	3.67 (1.75-7.71)	1.54 (0.64-3.73)	2.04 (0.73-5.67)
Any ED visit/hospital admission/nonemergency surgery in previous 2 y			
Yes (vs no)	2.51 (1.60-3.93)	2.54 (1.61-3.99)	2.80 (1.58-4.96)
Cost-related barriers to care			
Yes (vs no)	1.20 (0.81-1.78)	0.86 (0.54-1.38)	1.23 (0.70-2.15)

Abbreviations: CI, confidence interval; ED, emergency department; OR, odds ratio.

[a]This model was also adjusted for education and health care system type.

[b]This model was also adjusted for health care system type, number of chronic conditions, and number of prescription drugs.

[c]This model was also adjusted for health care system type.

[d]$P < .001$.

medication errors (OR = 0.75; 99% CI, 0.67-0.85) and self-reported laboratory errors (OR = 0.61; 99% CI, 0.54-0.70).

DISCUSSION

By using a multidimensional approach to define quality of care, this study confirms that Coordination of Care is a predictor of self-reported health-related errors. Specifically, we found that when patients perceive lapses in communication among their providers and receive conflicting information from multiple health care stakeholders as measured with the items of the Coordination of Care scale (see Table 2), they are more likely to report medical, medication, and laboratory errors. The findings from this investigation support results from a number of other published studies that suggested that Coordination of Care is an important predictor of perceived patient safety. After adjusting for potentially important confounding variables, there was a statistically significant association between Coordination of Care and self-reported medical error, medication error, and laboratory errors. These results are consistent with those by Taylor and colleagues,[29] who used a prospective cohort study of 223 hospitalized patients and after adjusting for sociodemographic variables and length of stay, patients' reporting care coordination deficiencies among staff were 4 times more likely to experience adverse or near miss events (OR = 4.4; 95% CI, 1.4-14.0).

In addition, the results of the current investigation agree with previous research based on the CWF survey. However, other studies differed in how Coordination of Care was defined. O'Hagan and colleagues examined the association of Coordination of Care and medical errors by examining the responses of participants to the question, "When you need care or treatment, how often does your general practitioner/regular doctor/the doctor know important information about your medical history?" as a measure of Coordination of Care.[30] Results of a bivariate analysis showed a significant association between patients who indicated that their physician rarely or never knew important information about their medical history (bivariate analysis) and medical errors ($P < .001$).[30] However, these results should be interpreted with caution because the investigators did not present information on this relationship after adjusting for other potential confounders. Lu and Roughead[13] and Scobie[31] measured poor coordination as the positive response to either unavailable test results or medical records at the time of appointment, or duplicate tests. In addition to these aspects, Schwappach included "receiving conflicting information from different providers" as measure of poor coordination of care.[32] The current investigation adds to the existing literature by using a more complete construct of Coordination of Care because it also incorporates items that assess the level of miscommunication between the primary care provider and specialists: Have you experienced the following when seeing a specialist? (1) the specialist did not have basic medical information from your regular doctor about the reason for your visit or test results; and (2) after you saw the specialist, the regular doctor did seem informed and up-to-date about the care you got from the specialist. Finally, other studies using data from the CWF survey defined a medical error as a combination of any medical or medication error, which may prevent the detection of different associations for individual error types. This study was able to examine the effect of perceived coordination of care and self-reported laboratory errors, an aspect not explored by previous studies.

There may be several potential explanations for the observed relationship between perceived coordination of care and patient safety. Patients may detect mishaps involving poor coordination of care more easily. For instance, missing relevant patient information during the point of care is a frequent problem and obtaining such information often demands the interaction between the health care provider or administrator and the patient, which alerts patient to the possibility of a care quality failure or increase their critical assessment of quality. Finally, it is possible that the results could be explained by the confounding effect of other factors not measured. For example, peoples' overall satisfaction with their health system may impact both their perceptions of care coordination and perceived safety. Although satisfaction with the health care system was not included in models, the analyses did account for other traits that could also reflect satisfaction with the health care system such as Access to Care, Continuity of Care, Communication of Care, and Providers' Respect for Patients' Preferences, potentially minimizing the risk of bias.

Findings from this study did not provide evidence to support the association between perceived patient safety and the other 4 dimensions of quality of care: Communication of Care; Access to Care; Continuity of Care; and Respect for Patients' Preferences. Despite the lack of statistically significant results, there are several important aspects that should be considered for further research. Because of the limited availability of items, in the current study, the Communication of Care measure was constructed with items that only focused on communication about prescription medications. This may explain why it appears that people who reported better levels of Communication of Care were less likely to self-report medication errors (OR = 0.93; 99% CI, 0.85-1.02). Although this relationship was not significant at the .01 level, further investigations should explore this topic to find more conclusive evidence about the relationship between Communication of Care and patient safety.

Results of this study should be interpreted in light of the limitations of a cross-sectional research design. The statistical associations found cannot be established as evidence for causality but as an exploratory step toward causality. Therefore, conclusions about the temporal association between quality of care and patient safety cannot be established. For example, this investigation cannot determine whether experiencing a medication error led respondents to perceive that a coordination of

care mishap occurred, or whether the perceptions of poor coordination of care commanded respondents to indicate that an error arose. Nonresponse bias might have influenced this study primarily due to survey nonresponse. The response rate in this study varied considerably among countries, as small as 9% for the Netherlands to 54% for Switzerland. Low response rate limits the generalizability of findings. While it is difficult to determine the extent of bias introduced as a result of refusal to participate by survey respondents, weighted analysis was conducted to account for and minimize survey nonresponse bias.

Findings from this study should be interpreted in light of respondents' ability to recall their health care experiences; the time interval between a health care encounter and the questions asked might influence the validity of responses. The questions of the CWF survey asked participants to recall events from the previous 2 years, which increases the window for recall bias. The patient safety and quality-of-care measures in the present investigation encompassed self-reported data in contrast to clinical data. Despite the provision of medical, medication error, and laboratory error definitions to respondents, the terms could be misunderstood, potentially increasing measurement error.

CONCLUSION

Health care systems are transitioning to a space of heightened transparency and accountability where payments for services are increasingly value-based. Thus, health care actors around the world have engaged in an active pursuit for innovative solutions to decrease errors. The majority of them, however, have focused mainly on the providers' role as opposed to those who ultimately receive care—and bear its consequences. Patients, from their unique viewpoint, can provide valuable insights on received care and play an important role in patient safety initiatives. Thus, patient engagement initiatives are essential in health care quality management, as they may be the most reliable reporters of some aspects of the health care process. This investigation showed evidence that supports the association between perceived coordination of care and self-reported medical, medication, and laboratory errors. As health care stakeholders continue to search for initiatives that improve care experiences and outcomes, this study's results emphasize the importance of guaranteeing integrated care.

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