



Medication safety perceptions in China: Media exposure, healthcare experiences, and trusted information sources

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ABSTRACT

Objective: Amid ongoing medication safety concerns in China and limited research on public perceptions, this study investigates the correlations between media exposure, healthcare experiences, and individuals' perceptions of medication safety. It also examines individuals' reliance on information sources during safety crises.

Methods: A multistage stratified random sampling was employed with the gross sample containing 3090 Chinese adults aged 18–60 years. Data were analyzed using multiple linear regression.

Results: Social media exposure was found to negatively correlate with perceptions of current medication safety and its perceived improvement, while exposure to television and print media showed positive correlations. Positive healthcare experiences were associated with improved medication safety perceptions. Among various information sources, healthcare professionals were deemed most trustworthy during medication safety incidents.

Conclusions: Media exposure and personal healthcare experiences significantly shape individuals' perceptions of medication safety in China, with healthcare professionals playing a crucial role in this context.

Practice implications:

Effective health crisis communication in China needs to be multifaceted, integrating traditional media and social media platforms to disseminate accurate information broadly. Additionally, healthcare professionals should be actively involved in crisis communication. Their role as trusted sources can be leveraged to clarify misconceptions, and reassure the public during medication safety incidents.

1. Introduction

Medication safety perception affects individual medication intake behavior [1]. While taking medication plays a crucial role in preventing or controlling diseases, people may reject or deviate from their medication plan suggested by healthcare providers if they perceive the safety of medication is poor [1,2].

Various factors can shape individuals' perceptions of medication safety. External sources of information, such as the media, can impact individuals' attitudes and beliefs about medications. Exposure to negative information may lead to the abandonment of effective medical therapy, potentially causing severe harm to patients' health [3]. Additionally, individuals' experiences with medication use (e.g., adverse reactions) and personal healthcare experiences may directly affect their evaluation of medications [4].

Despite China having one of the largest medication markets and being a major medication producer, little attention has been paid to its citizens' medication safety perceptions [5]. This study focuses on exploring Chinese citizens' medication safety perceptions. In the following sections, we will explain why we focus on media exposure and healthcare experiences as antecedents of medication safety perceptions and why this study is particularly relevant in China.

1.1. Media exposure and medication safety perceptions

The media plays a crucial role in shaping public awareness and perceptions on various topics, including medication safety. Previous studies have demonstrated significant links between individuals' medication safety beliefs and their media usage for acquiring health information [6]. The advent of the internet and social media has notably

Abbreviations: HINTS-China, Health Information National Trend Survey; TCM, Traditional Chinese Medication; TV, Television.

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expanded the scope through which individuals can access a vast array of health information from various sources [7]. Given the pervasive nature of media in today's digital age, understanding its influence is critical in understanding people's perceptions of medication safety. Additionally, the effects of exposure to different media should be considered, as individuals often encounter multiple media types concurrently, with each presenting information distinctly [8].

The Internet has become a popular platform for people seeking health information, including medication safety topics. It offers extensive access to health-related information [9]. However, the quality of online information is a significant concern [7]. Social media, filled with user-generated content, cannot always guarantee the accuracy of the information disseminated [10]; with widespread Covid-19 misinformation being a prime example [11,12]. Social media is also a common place for patients to share experiences with medication use and report adverse reactions [13]. While online information exposure can increase patients' concerns about medication [14–16], it also positively correlates with medication adherence in cases like HIV/AIDS [17].

On the other hand, health information in traditional media has distinct features. User-generated content is not present. TV and radio in China are typically official, with authorities monitoring and verifying their content [18]. Printed media, such as magazines and newspapers, undergo editorial processes to ensure the veracity of their content. Nonetheless, there is some overlap between traditional and online media, as many traditional media outlets, including TV and newspapers, operate websites to disseminate information. TV and print media in China have also been criticized for attracting audiences with exaggerated reports and profiting from inappropriate advertisements for health products and supplements [19,20].

Despite the variation among different media, existing medication studies that considered media influence often focused on a single source, overlooking the impact of multiple concurrent information channels [6]. To gain a more comprehensive understanding of the effects of media exposure, it is essential to analyze various media forms simultaneously.

1.2. The potential of personal healthcare experience on medication safety perceptions

While externally sourced information from media can influence individuals' perceptions of medication safety, personal healthcare experiences also shape their views [21]. Individuals' healthcare experiences are directly linked to their trust in the healthcare system [22]. Positive healthcare experiences tend to enhance this trust. Conversely, negative experiences, such as encountering medical errors or receiving poor care, can erode patient trust, leading to concerns about the healthcare system, including their medications [23].

Two observations in the literature led us to consider the potential effects of personal healthcare experience on medication safety perceptions. The first is the impact of adverse medical events on patients' loss of trust in the healthcare system [24,25]. Adverse events in hospitals are not uncommon. Medical record reviews and patient surveys indicate that approximately 7 % of patients have experienced them, and the actual incidence may be underestimated [26]. Unpleasant episodes in hospitals, which might not necessarily be as severe as adverse medical events, may still decrease patients' general trust in the health sector, including medication safety.

The second observation concerns the impact of the patient-provider relationship on patients' medication perceptions. For instance, patient-centered communication, which is associated with better healthcare evaluations, has been shown to improve patients' adherence to their medication regimens [21,27,28]. Taking vaccines as an example, increased satisfaction with provider-patient communication correlates with higher parental vaccine acceptance [29,30]. It is important to note that both adverse medical events and patient-provider relationships are crucial factors that directly influence patients' evaluations of their personal healthcare experiences. Therefore, it is plausible to expect

patients' healthcare experience as an antecedent of their medication safety perception.

1.3. Medication safety situation in China

The medication safety situation in China is concerning. With one of the largest populations of medication consumers, it includes users of both traditional Chinese medication (TCM) and Western medications. TCM, known for its natural ingredients, is widely accepted in China [31]. However, the high incidence of adverse drug reactions, particularly related to TCM injections, has raised public concern [32]. Moreover, several safety scandals involving Western medications in the past decade have significantly caught the public's attention.

The most severe medication safety scandals in China have involved vaccines. Since 2010, when media reports surfaced about significant children health concerns possibly linked to faulty vaccines, vaccine safety crises have recurred in 2014, 2016, and 2018 [19,33,34]. Each scandal led to decreased trust in vaccines and lower vaccination rates. The recurring safety incidents and inadequate crisis communication have been primary factors contributing to vaccine hesitancy in China [35].

While several Chinese studies have explored the impact of media reporting on spreading medication safety incidents [36,37], none have specifically addressed people's trust or reliance on different information sources during such crises. Understanding the public's choice of trustworthy information sources is crucial for effective health crisis communication.

1.4. Research questions

Our study aims to explore medication safety perceptions in China. We intend to investigate the antecedents of medication safety perceptions, including media exposure and personal healthcare experiences. Our first research question (RQ1) seeks to understand the relationship between media exposure and medication safety perceptions. We then aim to determine how personal healthcare experiences correlate with medication safety perceptions (RQ2). Lastly, we aim to identify which information sources are considered trustworthy during medication safety incidents in China (RQ3).

2. Methods

2.1. Sampling

This study is based on data from the Health Information National Trends Survey (HINTS) – China, designed similarly to HINTS-US. We utilized the most recent HINTS-China data, collected in 2017. This dataset has also been used by other scholars to explore various topics, including health information-seeking behavior [38], cancer information avoidance [39], beliefs about food rumors [40], and patient-provider communication [38].

HINTS-China utilized a multistage stratified random sampling method, reaching 3090 respondents aged 18 to 60 years. Two cities, Beijing and Hefei, were selected, representing distinct levels of administrative and economic development. In each city, urban and rural neighborhoods were randomly chosen, and households within these neighborhoods were then selected randomly. Data collection involved door-to-door visits. Trained staff from the Chinese Center for Health Education administered printed questionnaires. Respondents capable of reading and writing completed the questionnaires independently, while staff assisted those with low literacy. The detailed sampling method is described in Zhao et al., 2015.

2.2. Measures

Two measures from the HINTS survey were used to estimate

medication safety perceptions, serving as dependent variables: Perception of Current Medication Safety (“The current status of medication safety is satisfying”) and Perception of Medication Safety Improvement (“The medication safety situation has gradually improved in recent years”). Respondents were asked to express their level of agreement with these statements. The question about current medication safety was posed before that regarding medication safety improvement. A five-point Likert scale ranging from strongly disagree (=1) to strongly agree (=5) was employed (Table 1).

Media exposure was gauged by asking respondents about their frequency of exposure to various media channels for health or medical information. This included twelve different media types: newspapers, magazines, TV, radio, websites, news apps, medical/health or food apps, other apps, Baidu and other search engines, Microblog, WeChat, blogs, and forums. A four-point frequency scale was used, ranging from never (= 1) to always (= 4) (Table 1). Newspapers and magazines were grouped to represent print media, with mean values of responses applied. Website and search engine responses were averaged for web-based media. News apps, medical/health or food apps, and other apps were classified as mobile apps ($\alpha = .80$), and their mean values were used. Microblog, WeChat, blogs, and forums were collectively considered as social media ($\alpha = .74$), with mean values applied. This classification method follows previous studies using HINTS-China data [38].

Personal healthcare experiences were measured by asking participants who had visited doctors, nurses, or other medical personnel for healthcare purposes in the past year to rate the quality of healthcare services they received. Answers were indicated on a five-point scale ranging from very poor (=1) to very good (=5) (Table 1).

A set of socioeconomic and demographic variables was included to control the confounding effects. Age was measured in years; education was measured as the highest grade completed (primary school and below = 1, bachelor’s degree above = 6); gender was a dummy variable, with females coded as 0. Occupational status was coded 0 for the retiree,

student, or unemployed and 1 for employed persons. Personal monthly income was divided into five groups with a five-point scale, ranging from no income (= 1) to 10,000 Chinese yuan or more (= 5). Respondents’ residence was coded 0 for rural and 1 for urban citizens. Self-rated health status employed a five-point scale from very poor (=1) to very healthy (=5).

Furthermore, respondents were asked which information sources they would rely on during medication safety incidents or scandals. A total of 24 information sources and an “others” option were provided, covering various types of media, social groups, and interpersonal communication channels. Each respondent was asked to name three options in order of reliance, beginning with the one they relied on most.

2.3. Statistical analysis

Statistical analyses were performed using SPSS version 28. During data cleaning, two respondents were identified with inappropriate answers to questions about trusted information sources during medication safety incidents and were therefore excluded from the study, representing 0.065 % of the total sample (2/3090).

We used descriptive statistics to obtain an overview of the participants’ social characteristics and their trust in information sources. Multiple linear regression analyses, using Perceptions of Current Medication Safety and Perception of Medication Safety Improvement as dependent variables, were further performed. Covariates included age, gender, education, employment, personal income, residence, and perceived health status, with gender, employment, and residence treated as dummy variables. Regression Models 1 and 3 were conducted to examine the relationships between medication safety perceptions and media exposure for the entire sample. Models 2 and 4 were used within a subgroup of 663 respondents who had received healthcare from professionals within the past year, to assess the relationships between personal healthcare experiences and medication safety perceptions.

3. Results

3.1. Descriptive statistics of the study sample

The participants have a mean age (M) of 35.13 years, with a standard deviation (SD) of 11.54 years. Females comprise 61.1 % of the sample, while males account for 38.9 %. In terms of education levels, 28.9 % of the participants hold a bachelor’s degree or higher, and 26.1 % have completed junior college. A significant portion of the sample (over 70 %) are employed and earn a monthly income of over 2500 Chinese Yuan. The sample is evenly distributed between urban and rural dwellers, with 49.2 % living in urban areas and 50.8 % in rural areas. Generally, participants rate their health as healthy (M = 3.98; SD =.79) (Table 2).

3.2. The relationship between media exposure and medication safety perceptions

Print media, including newspapers and magazines, was positively associated with the Perception of Current Medication Safety ($\beta = .071$, $P = .018$, 95 % CI [.012,.131]), and this association remained significant in the subgroup analysis ($\beta = .140$, $P = .012$, 95 % CI [.031,.250]) (Table 3). TV demonstrated strong and consistent relationships with two outcome variables. It was positively associated with the Perception of Current Medication Safety (Entire sample: $\beta = .137$, $P < .001$, 95 % CI [.093,.181]; Sub-group: $\beta = .119$, $P = .011$, 95 % CI [.027,.211]) and the Perception of Medication Safety Improvement (Entire sample: $\beta = .129$, $P < .001$, 95 % CI [.086,.172]; Sub-group: $\beta = .123$, $P = .006$, 95 % CI [.035,.211]). Web-based media, including websites and search engines, also demonstrated a positive relationship with the Perception of Medication Safety Improvement ($\beta = .071$, $P = .014$, 95 % CI [.014,.127]). However, exposure to health information through social media showed negative associations with both the Perception of Current Medication

Table 1
Overview of variables.

Variable	Questionnaire	Scaling details
Dependent variable: medication safety perception		
Perception of Current Medication Safety	To what extent do you agree with the following statement? “The current status of medication safety is satisfying.”	Single item, 5 answer categories from 1 = Strongly disagree to 5 = Strongly agree.
Perception of Medication Safety Improvement	“The medication safety situation has gradually improved in recent years.”	Same as above
Focal independent variables		
Media exposure	“Have you encountered health or medical information from [media source] in the past 12 months?” Media sources include: 1) Newspapers; 2) Magazines; 3) TV; 4) Radio; 5) Websites; 6) News apps 7) Medical health or food APP; 8) Other Apps; 9) Baidu and other search engines; 10) Microblog; 11) WeChat; 12) Blog and forum.	4-category frequency scale, ranging from never (= 1) to always (= 4)
Personal healthcare experiences	“In general, what’s your assessment of the quality of healthcare services you have received in the past 12 months?”	Single item, 5 answer categories from 1 = Very poor to 5 = Very good.

Table 2
Descriptive statistics of the study sample.

Variables	n = 3088
Social-demographic	
Age (M/SD)	35.13/11.54
Gender (n/%)	
Female	1888/61.1 %
Male	1200/38.9 %
Education (n/%)	
Primary school and below	66/2.2 %
Junior middle school	487/15.8 %
High school	836/27.1 %
Junior college	805/26.1 %
Bachelor's degree	715/23.2 %
Bachelor's degree above	177/5.7 %
Employment (n/%)	
Employed	2312/74.9 %
Unemployed	776/25.1 %
Personal income (%)	
Less than ¥ 1500	510/16.5 %
¥ 1,500–2499	403/13.1 %
¥ 2,500–4999	1263/40.9 %
¥ 5,000–9999	735/23.8 %
¥ 10,000 and above	177/5.7 %
Residence (n/%)	
Rural	1570/50.8 %
Urban	1518/49.2 %
Perceived health status (M/SD)	3.98/.79
Focal Independent variables	
Health information exposure (M/SD)	
Print media	1.77/.82
Radio	1.87/.93
Television	2.62/1.05
Web-based media	2.34/.89
Mobile Apps	2.01/.78
Social media	2.09/.78
Healthcare experiences (M/SD) (n = 667)	3.43/.70
Dependent variables	
Perception of Current Medication Safety (M/SD)	2.76/1.03
Perception of Medication Safety Improvement (M/SD)	3.05/1.00

Safety ($\beta = -.142$, $P < .001$, 95 % CI $[-.205, -.080]$) and the Perception of Medication Safety Improvement ($\beta = -.101$, $P = .001$, 95 % CI $[-.162, -.040]$). Mobile apps also showed negative associations with the two perception outcome variables, although these correlations were not statistically significant (Table 3).

In response to RQ1: Individuals who frequently obtain health information from social media tend to perceive medication as less safe and believe that the medication safety situation has not improved. Conversely, individuals more frequently exposed to health information from TV and print media tend to believe that the medication safety situation has improved.

3.3. The relationship between personal healthcare experience and medication safety perceptions

The results regarding healthcare experiences, as shown in Model 2 and Model 4 of Table 3, involved a subgroup of 663 respondents who had encountered healthcare professionals in the previous year. The evaluation of healthcare experience demonstrated positive relationships with the Perception of Current Medication Safety ($\beta = .299$, $P < .001$, 95 % CI $[.196, .402]$) and the Perception of Medication Safety Improvement ($\beta = .214$, $P < .001$, 95 % CI $[.115, .313]$). Thus, RQ2 is answered: individuals who rated their past healthcare experiences as more satisfactory tend to have better perceptions of medication safety.

3.4. Trusted information sources in medication safety incidents

Table 4 illustrates the trusted information sources of participants during medication safety incidents. For their first choice, 60.1 % of participants selected doctors and healthcare professionals, followed by

family members (11.5 %) and TV (7.7 %). In their second choice, family members were the most selected information source, chosen by 36.5 % of participants, followed by friends and colleagues (12.8 %). For the third choice, friends or colleagues were the most chosen, accounting for 28.4 % of participants.

The answer to RQ3 is clear: interpersonal communication channels, including doctors or healthcare professionals, family members, friends, or colleagues, are the most trustworthy sources of information during medication safety incidents, with health professionals being particularly the most trusted.

4. Discussion and conclusion

4.1. Principal results

Medication safety has been a significant concern among Chinese consumers, with safety scandals continuing to emerge over the past two decades. Following these scandals, crisis communication in China has often failed to rebuild people's trust in medications [35]. However, the focus on people's perceptions of medication safety has been limited [5]. Our study, by including various traditional and online media exposures as antecedents to people's perceptions, comparatively examines the effects of different media types on public perceptions of medication safety. Understanding these diverse media effects helps in tailoring effective strategies to address public concerns about medication safety.

We found varied results based on the medium type. TV and print media were associated with more positive safety perceptions, while social media were linked to more negative perceptions. The contrasting results between TV and print media, compared with social media, align with previous studies [6,14]. A study on influenza vaccination found that social media use was associated with people's poor evaluation of vaccine efficacy and more vaccine safety concerns, whereas newspapers were associated with a better perception of efficacy [6]. Another longitudinal study with chronic patients also showed that patients who used the internet as an information source during their treatment were more likely to express concerns over their medication [14].

The negative impact of social media can be explained in two ways. First, individuals exposed to information on social media are more likely to encounter negative content related to medication safety. Social media in China has become a primary platform for the public to discuss medication safety scandals [33]. A study analyzing posts on Weibo (a Chinese social media platform similar to Twitter) during the vaccine scandal in 2018 found that expressions of distrust in vaccines increased significantly during and immediately after the scandal. Content analysis of these posts revealed that discussions were centered on the scandal and users' experiences with adverse vaccine reactions [42]. Consequently, individuals who frequently use social media are more likely to encounter news and posts about safety scandals, increasing their awareness of medication safety issues and leading to a poorer overall perception of medication safety. Second, individuals who frequently choose social media as their information source may have lower trust in government agencies, including the healthcare system. As a result, they may prefer social media over government-operated media, such as TV, to acquire information.

On the other hand, TV, primarily administered by the government, often features information that is verified by authorities in China [18]. Print media also undergoes an editorial process and is regulated by these authorities. Therefore, negative reporting on administrations in medication scandals [43], and the spread of mis/disinformation, such as vaccine rumors, are less likely to be found in these media. Furthermore, user-generated content, such as self-reported adverse medication reactions or posts on medication scandals, is less visible in traditional media. The positive findings regarding TV and print media underscore their role in promoting health awareness and behavior, as noted in other studies [44]. Nevertheless, TV and print media in China have unique characteristics, as many are operated by authorities or formal

Table 3
Correlating perceptions of medication safety in China with media exposure and personal healthcare experience: results of multiple linear regression.

Variables	Perception of Current Medication Safety				Perception of Medication Safety Improvement			
	Model 1 (n = 3088)		Model 2 ^a (n = 663)		Model 3 (n = 3088)		Model 4 ^a (n = 663)	
	Estimate (P-value)	95 % CI	Estimate (P-value)	95 % CI	Estimate (P-value)	95 % CI	Estimate (P-value)	95 % CI
Social demographics								
Age	.011 *** (P < .001)	[.007,.015]	-.002 (P = .688)	[-.007,.011]	.011 *** (P < .001)	[.007,.015]	.004 (P = .315)	[-.004,.012]
Gender	.110 ** (P = .004)	[.036,.184]	.125 (P = .103)	[-.025,.275]	.073 (P = .049)	[.000,.145]	.044 (P = .546)	[-.107,.172]
Education	-.034 (P = .078)	[-.072,.004]	-.036 (P = .364)	[-.115,.042]	-.046 (P = .15)	[-.082,.009]	-.078 * (P = .042)	[-.167, -.018]
Employment	-.078 (P = .140)	[-.183, -.026]	-.086 (P = .401)	[-.287,.115]	-.093 ** (P = .074)	[-.194, -.009]	-.072 (P = .464)	[-.273,.125]
Personal income	.082 *** (P < .001)	[.040,.125]	.100 * (P = .026)	[.012,.188]	.043 * (P = .041)	[.002,.085]	.060 (P = .160)	[-.030,.140]
Residence	.113 ** (P = .004)	[.035,.191]	.242 ** (P = .005)	[.072,.413]	.067 (P = .083)	[-.009,.143]	.049 (P = .556)	[-.090,.233]
Perceived health status	.137 *** (P < .001)	[.091,.182]	.136 ** (P = .007)	[.037,.236]	.097 *** (P < .001)	[.053,.141]	.093 (P = .057)	[-.006,.182]
Focal independent variables								
Print media	.071 * (P = .018)	[.012,.131]	.140 * (P = .012)	[.031,.250]	.044 (P = .132)	[-.013,.102]	.060 (P = .265)	[-.045,.164]
Radio	-.035 (P = .175)	[-.086,.016]	.006 (P = .900)	[-.087,.099]	-.038 (P = .133)	[-.088,.012]	-.044 (P = .329)	[-.133,.045]
Television	.137 *** (P < .001)	[.093,.181]	.119 * (P = .011)	[.027,.211]	.129 *** (P < .001)	[.086,.172]	.123 * * (P = .006)	[.035,.211]
Web-based media	.051 (P = .084)	[-.007,.109]	.031 (P = .593)	[-.084,.147]	.071 * (P = .014)	[.014,.127]	.070 (P = .216)	[-.041,.180]
Mobile Apps	-.042 (P = .211)	[-.108,.024]	-.125 (P = .060)	[-.256,.006]	-.015 (P = .654)	[-.079,.050]	-.094 (P = .143)	[-.219,.032]
Social media	-.142 *** (P < .001)	[-.205, -.080]	-.082 (P = .234)	[-.216,.053]	-.101 *** (P = .001)	[-.162, -.040]	-.051 (P = .434)	[-.180,.078]
Satisfaction of healthcare quality			.299 *** (P < .001)	[.196,.402]			.214 * * (P < .001)	[.115,.313]
R ²	.087		.174		.072		.109	

organizations [18]. Therefore, their role in enhancing medication safety perception may not be applicable in other national contexts.

Intriguingly, our analysis revealed a positive relationship between exposure to health information on web-based media (including websites and search engines) and perceptions of medication safety, a relationship not observed with other online media forms. This could be because traditional media and official organizations often operate their own websites to disseminate information, blurring the distinction between web-based and traditional media. However, further evidence from future studies is necessary to fully understand this finding.

Health professionals appear to be promising in addressing the medication safety concerns of Chinese people. We found a positive relationship between safety perceptions and satisfying healthcare experiences. This result aligns with previous studies showing that better healthcare experiences can improve patients' medication adherence and acceptance of certain medications [45,46]. However, it is important to note that individuals with a positive predisposition towards the medical or health system may inherently hold positive attitudes towards all related aspects, including healthcare services and medication safety, thus leading to a positive association between them. Future studies should consider the influence of individuals' general attitudes towards the healthcare system. Additionally, we found health professionals were regarded as the most trustworthy information sources during safety incidents. A previous study demonstrated that Chinese people place the strongest trust in health information from healthcare professionals [47]. Our study further confirms that this strong trust persists in health crises. Therefore, the potential of healthcare professionals, such as physicians, in health crisis communication needs to be further explored by future studies.

Our study delved into the sources of information trusted by Chinese people during medication safety scandals. These sources encompassed a

variety of media, interpersonal communication channels, and different types of organizations. To our knowledge, this is the first study to comprehensively assess the trusted information sources of Chinese people in the context of a medication crisis. Understanding which sources Chinese people trust is particularly useful for identifying effective channels to communicate important health information during crises. We discovered that, in addition to healthcare professionals, family members, friends, and colleagues are considered the most trustworthy sources of health information during safety crises. This preference can be explained by the Confucianism and familism cultures, which place substantial value and trust in close social relations. In contrast, internet-based health information was the least trusted. This suggests that, during health crises, Chinese people tend to prefer and trust health information from interpersonal communication channels the most.

4.2. Limitations

This study has several limitations. Firstly, despite using the 2017 HINTS-China dataset, which is the most recent and is still valued by scholars for exploring health perceptions in China [40–47], it was gathered prior to the Covid-19 pandemic. Given the extensive information surrounding the Covid-19 vaccine, individuals' perceptions of medication might have shifted since the pandemic. Nevertheless, our study primarily focuses on the relationship between information exposure and personal healthcare experiences with medication safety perceptions. The nature of information available across various media has remained relatively consistent in China; for example, social media continues to serve as a platform for individual expression. The types of media exposure included in our study still reflect the variety of current sources of information available to individuals. Furthermore, our

Table 4
Chinese people's trusted information sources during medication safety incidents.

Variables	First choice	Second choice	Third choice
Information sources (n/%)			
Interpersonal channels			
Doctor or healthcare professionals	1857/60.1 %	335/10.8 %	254/8.2 %
Family member	355/11.5 %	1126/36.5 %	268/8.7 %
Friend or colleague	158/5.1 %	395/12.8 %	877/28.4 %
	2370/76.7 %	1856/60.1 %	1399/45.3 %
Traditional media			
Television	238/7.7 %	336/10.9 %	301/9.7 %
Newspapers	50/1.6 %	71/2.3 %	94/3.0 %
Magazine	14/.5 %	42/1.4 %	56/1.8 %
Radio	22/.7 %	45/1.5 %	48/1.6 %
Book	21/.7 %	86/2.8 %	113/3.7 %
	345/11.2 %	580/18.8 %	612/19.8 %
Official institutes and social organizations			
Official government agency	170/5.5 %	303/9.8 %	297/9.6 %
Academic research institution	16/.5 %	51/1.7 %	148/4.8 %
International organization	15/.5 %	45/1.5 %	68/2.2 %
Business organization	6/.2 %	7/.2 %	16/.5 %
Religious organization or leader	0	3/.1 %	13/.4 %
Community or neighborhood committee	3/.1 %	7/.2 %	41/1.3 %
Charitable organization	0	5/.2 %	16/.5 %
Telephone hotline	7/.2 %	11/.4 %	16/.5 %
	217/7.0 %	432/14.0 %	615/19.9 %
Online media			
Website	87/2.8 %	101/3.3 %	191/6.2 %
News APP	41/1.3 %	46/1.5 %	86/2.8 %
Health-related APP	11/.4 %	16/.5 %	35/1.1 %
Other APP	0	4/.1 %	2/.1 %
Search engine	9/.3 %	4/.1 %	49/1.6 %
MicroBlog	2/.1 %	8/.3 %	24/.8 %
WeChat	6/.2 %	40/1.3 %	66/2.1 %
Blog and forum	0	0	5/.2 %
	156/5.1 %	219/7.1 %	458/14.8 %
Others	0	1/.0 %	4/.1 %
Total	3088	3088	3088

participants, ranging in age from 18 to 60, continue to represent a significant segment of China's population. Hence, we anticipate that our study's findings will retain their relevance and implications. However, the results should be interpreted with caution regarding the safety perceptions of older populations. We recommend that future studies on medication perception use more recent data and include all age groups in China.

Secondly, the outcome variables were assessed using two single-item questions: one exploring satisfaction with the current status and the other examining perceptions of safety improvement. The wording used to measure the perception of medication safety improvement might suggest to participants that the recent medication safety status is unsafe. Although we administered this survey question after asking about the recent status of medication safety, a potential bias exists. We also lack information about participants' previous perceptions of medication safety, which reduces the precision in assessing the improvement in safety perception. However, considering the ongoing safety incidents in China since 2010, including a severe vaccine scandal that occurred in 2016 not long before the data collection, we believe this outcome measure provides valuable insight into the Chinese public's perception of the medication situation in their country. For future studies, we suggest incorporating multiple items to estimate medication safety

perceptions more accurately.

Lastly, we employed a cross-sectional survey, which cannot establish causal inferences. The R^2 values in our regression analysis are relatively small, ranging from .072 to .174. This indicates that there might be other significant antecedents explaining individuals' safety perceptions that are not included in our study. For instance, participants' past medication uptake experiences can influence their perceptions of medication safety and should be considered as covariates. However, the HINTS-China survey did not collect information about participants' previous medication uptake experiences, preventing us from considering this crucial factor in our analysis.

4.3. Practical implications

Our study highlights several practical implications. Firstly, while traditional media such as TV and print media are effective for disseminating health information, policymakers need to address the challenges posed by social media, which can negatively impact public perceptions of medication safety. Therefore, an effective media strategy for crisis communication should integrate both traditional and new media platforms. Secondly, healthcare professionals should be more actively engaged in public communication during health crises. Providing specialized training to these professionals will enable them to effectively disseminate medication knowledge and dispel misconceptions among patients, thereby enhancing public trust in medication safety.

5. Conclusions

The present study identifies media exposure and personal healthcare experiences as significant factors influencing individuals' perceptions of medication safety. Exposure to TV and print media is linked to more positive perceptions of medication safety, whereas exposure to social media is associated with more negative perceptions. Furthermore, patients' healthcare experiences are also correlated with their perceptions of medication safety; the more satisfied they are with their healthcare experiences, the more positively they perceive the safety of medication. In addition, interpersonal communication channels, particularly healthcare professionals, are considered the most trustworthy sources of information during medication safety incidents. This highlights the importance of leveraging health professionals as effective channels for delivering timely and transparent information to the public in future health crises in China.

Ethics approval and consent to participate

The Health Information National Trends Survey (HINTS) – China, 2017 was approved by the Institutional Review Board of the School of Journalism and Communication at Beijing Normal University. We confirm that all participants provided their informed consent for the study, and the data were treated with complete anonymity.

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CRediT authorship contribution statement

Chang Angela: Writing – review & editing. **Schulz Peter J.:** Writing – review & editing, Conceptualization. **Lu Qianfeng:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization.

Declaration of Competing Interest

None declared.

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