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Analysis of Factors Affecting Social Media Disaster Information Sharing among Young Adults: An Empirical Study Using SEM-PLS Approach

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Abstract. The flooding crisis has raised significant public safety concerns, spotlighting the challenges and opportunities of leveraging social media in disaster management. Given the rising frequency of urban flooding in China, young adults' social media information behaviours play a pivotal role in disaster responses. Therefore, this study explores the critical factors influencing disaster information sharing among young adults during extreme urban flood events. Using a quantitative research methodology, researcher conducted an online survey with 613 young adults from flood-prone urban areas. The structural analysis results confirmed that social media dependency significantly influences self-efficacy and perceived severity, all of which positively correlated with the intention to share urban flood information. However, no significant relationship was observed between social media dependency and urban flood information–sharing behaviour. The findings underscore the importance of prioritising consideration of individual psychological factors when formulating disaster communication strategies. Additionally, it offers distinctive insights into the prospective utilisation of social media in flood communication.

Keywords: Social media, communication, information sharing, urban floods, young adults

1. Introduction

In recent years, urban flooding caused by extreme rainfall events has become increasingly frequent across China, emerging as a significant social issue that cannot be overlooked. Internet users have taken to social media, often using humor to cope with the gravity of the situation by making remarks such as "watching the sea in the city" and "sailing on land." In fact, urban areas, in particular, are more vulnerable to severe damage from flood disasters caused by heavy rainfall due to their unique socioeconomic and geographical vulnerabilities, especially in comparison to rural regions. Against the backdrop of intensifying global climate change, low-probability but high-impact extreme weather events, such as the catastrophic July 20th torrential rain in Zhengzhou, are expected to increase in both frequency and intensity [1].

To date, computer-based technology such as social media has proven to be an effective tool for urban flood management and communication [2–7]. Additionally, several studies have demonstrated that sharing high-precision disaster information on social media can significantly enhance the collective disaster preparedness of affected communities [8–11]. Nevertheless, compared to internet users in Western countries, Chinese netizens exhibit lower levels of engagement in disaster-related online activities [4]. Additionally, the role of social media as a tool for disaster response in China has not yet achieved widespread recognition, largely due to a lack of theoretical foundation and policy support [12,13]. In contrast to the international community's proactive exploration and implementation of social media in disaster management, China's practices in this filed remains relatively lagged. Therefore, a comprehensive investigation of social media user behavior in sharing disaster-related information is crucial.

In light of this, an in-depth investigation into the behavior of social media users in sharing disaster-related information could not only help uncover the potential and challenges of social media in disaster response, but also offer new perspectives and approaches for applying flood disaster prevention technologies. This, in turn, could advance the development of disaster management strategies and practices in China, thereby enhancing the nation's overall disaster preparedness. This study introduces the PMT to examine young adults' intentions and behaviour regarding urban flood information sharing. By examining the intertwined psychological and behavioural factors, this study aims to provide a viable approach to using social media to mitigate imminent urban flooding risks.

2. Literature Review

2.1. Social Media in Disaster Communication

A fundamental principle of disaster communication is that reactions in scenarios prepared for beforehand are ideal, as when emergencies are anticipated, responses are more straightforward to implement and communication can take place quickly and accurately [14]. To facilitate this process, social media offers emergency management authorities, social organisations and scholars a tool that allows for a rapid and effective reaction to changing circumstances, providing the opportunity for real-time situational updates [14]. The rise of social media has redefined disaster communication as a rapidly forming network beyond geographical limitations and facilitated interactive engagement on both the societal and individual levels [15]. Currently, social media is being used in all stages of disaster preparedness [16,17], response, mitigation and recovery [17,18].

Generally, social media functionality varies according to the stages of disaster management. First, during the preparation phase, authorities integrated social media platforms into the early warning system and provided public options to increase their self-preparation and protection [4,15]. Sharp and Carter also revealed that using social media can facilitate efficient recruitment and coordination of volunteers and reserve resources before disasters. Empirical evidence indicates that employing social media in such situations reduces the time spent and expands the target audience significantly beyond the capabilities of conventional media channels such as television and telephone [11]. Furthermore, during the subsequent flood disaster response phase, authorities can use social media platforms to manage disasters, for example, in coordinating rescue forces and supply allocation [10,19]. In their study of 'help-seeking' and 'responding to help requests' behaviours on social media during hurricanes, [20] found that communities can use social media to share information in real time and to activate local disaster response and resilience measures and that social media often supports communities to become self-sufficient in the event of flooding. Moreover, as the disaster enters the mitigation and recovery phase, authorities and social organisations can further employ social media to quash rumours [21,22], organise charitable donations and recruit volunteers for reconstruction or post-disaster psychological aid [7,19,23].

2.2. Disaster Information Sharing

Sharing information is one of the primary behaviours of social media users during emergencies [24]. Sharing refers to reposting content while acknowledging its source, enabling social media users to participate in disseminating information on the platform [25]. The extensive collection of literature on sharing has focused primarily on examining various factors that may facilitate or impede information sharing. In general, two broad categories of antecedents are worth exploring in this study [26]. The first classification refers to the characteristics or nature of the information itself. For example, several studies explored how the characteristics of information sources (e.g. attractiveness, trustworthiness and expertise) influence information sharing [27,28]. The second, and potentially one of the most thoroughly examined categories, concerns the motivations for sharing information; that part is the central focus of the current study. Noticeably, Oh and Syn [29] suggested a variety of specific motivations associated with social media sharing (e.g. enjoyment, self-efficacy, social engagement, reputation and reciprocity), with self-efficacy being one of the most influential factors influencing people's behaviours [30].

Information sharing has long been recognised as being crucial to effective disaster response [31]. For example, in disasters such as Hurricane Katrina and the Haitian earthquake, the release of government relief information was plagued by its slow and complex process, impeding the effectiveness of the overall disaster response. It is virtually impossible to share information quickly with typical disaster response systems since they concentrate on the team's internal information sources and frequently require review and approval before sharing any information [32]. Social media relies on crowdsourcing [10,33], which enables rapid information sharing among victims and reflects their needs promptly. In practice, research by Lin et al. confirms that in times of disasters, individuals are inclined to use social media platforms for information sharing [34]. An examination of extreme weather events such as the 2013 winter storm Nemo and severe haze in eastern China found that during crisis-related events, the number of retweets appeared to double compared to normal events.

One of the most solid pieces of evidence proves that information sharing consistently contributed to mitigation and recovery by using the 'wisdom of crowdsourcing' during the 7.20 Henan urban flood disaster. Netizens spontaneously organised on social media to use an online 'Waiting for Rescuer Information' form to collect rescue data. Within 48 hours, the online form garnered 6.5 million views and received contributions from over 300,000 individuals, transforming it rapidly into a versatile flood resource coordination platform [35]. This rapid dissemination of social media disaster information has played a crucial role in assisting both official and civil organisations in adjusting to and controlling the subsequent evolution of disaster events [36]. This interactive functionality is achieved through social media platforms, facilitating interaction and sharing by making actions and participants visible [37]. Therefore, it enhances effective collaboration in disaster responses dramatically between the two parties.

3. Theoretical Foundation and Hypotheses Development

3.1. Protection Motivation Theory

This study uses PMT as a theoretical foundation. Generally, PMT attempts to identify the critical stimulus variables in a fear appeal and posits cognitive processes that mediate the acceptance of a communicator's advice [38]. Rogers et al. [39] further proposed two cognitive processes in their revised version of PMT: coping appraisal and threat appraisal. Protection motivation theory states that changes in coping intentions lead to coping behaviour and that when an individual exceeds a certain level of threat appraisal, they begin assessing their available coping mechanisms [40]. Furthermore, the PMT framework, initially proposed as a health promotion paradigm, shares fundamental concepts in motivating health protective behaviours and disaster mitigation efforts [41]. Protection motivation theory can be applied widely in investigating disaster preparedness–related behaviours, rendering it one of the most prevalent decision-making frameworks in disaster risk reduction [41,42].

This study has streamlined the original PMT framework, focusing on selecting two pivotal factors: perceived severity and self-efficacy. Both are well-recognised dimensions of the PMT framework and can promote protective motivation in the face of risk [43]. Noticeably, perceived severity interprets individuals' perception of flood risk, while self-efficacy reflects individuals' expectations regarding the effectiveness, simplicity and affordability of flood protection measures [40,44,45].

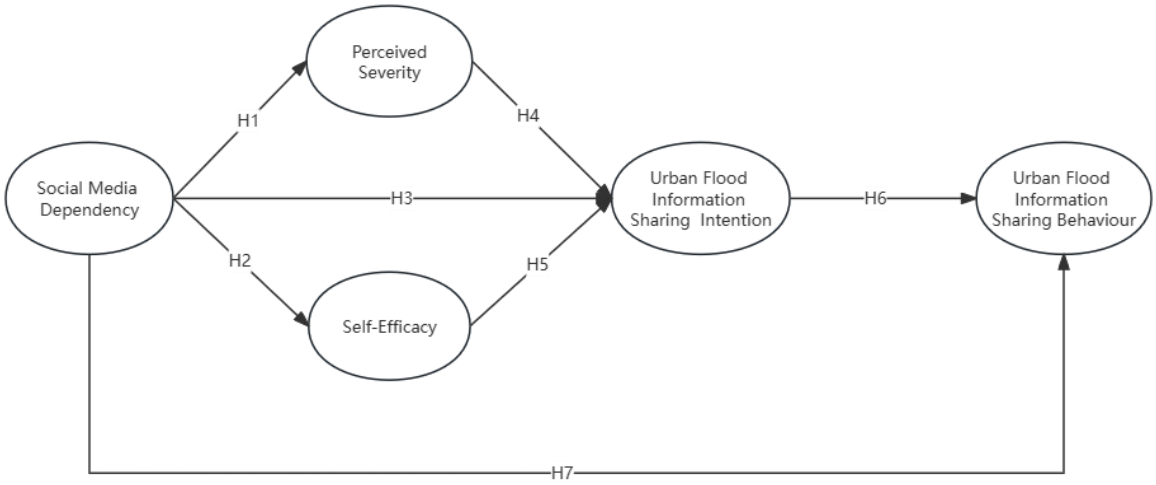

Figure 1. Theoretical framework of this study

Moreover, media factors play a significant role in the PMT model for disaster risk reduction. Media influences various variables related to PMT, including social media, newspapers and television, all of which serve as crucial sources of disaster information [46]. As Ball-Rokeach [47] claimed, structural dependence on media systems tends to exacerbate individuals' reliance on media, particularly in ambiguous environments caused by crisis. The greater an individual's dependency on media associated with specific information, the higher the likelihood that such information will alter their cognition, affect and behaviour [48]. Nowadays, the tendency to use social media platforms for disaster communication is escalating, with the public gradually engaging more [49,50]. Therefore, this study considers the inclusion of social media dependency essential. The proposed research framework allows us to observe directly not only the impact of social media dependency on flood information sharing but also its effect on perceived severity and self-efficacy, and thus to analyse the factors influencing flood information–sharing intention and behaviour (Figure 1).

3.2. Hypotheses Development

Individuals tend to rely more on the media in ambiguous situations, thus locating social media as a potential primary source of disaster information [51]. Individuals relying more on social media may be able to access information more quickly, thereby perceiving the severity of disasters and conducting threat appraisal. AlQahtany and Abubakar [52] proved that social media has become the second preferred source of information for disseminating disaster information among people in disaster-prone areas. Similarly, Kankanamge et al. [5] demonstrated that users are likely to assess the severity of disasters through published content and geographical location information on social media. These suggest the hypothesis that social media dependency and perceived severity may have a strong relationship; therefore, this study proposes:

H1: Social media dependency positively affects information sharing behaviour on the perceived severity of urban floods

Generally, self-efficacy reflects an individual's perception of their overall ability to safeguard themselves against a specific threat [53]. Gumasing et al. asserted that self-efficacy is the key predictor of coping appraisal in arousing people's protection

motivation among the sub-variables of coping appraisal, which is assumed to play a significant role in determining specific preventive practices in the face of disasters [54]. Furthermore, Ball-Rokeach [55] noted that individuals' sense of self-efficacy is compromised when they are unable to depend on stable societal structures or anticipate future event trajectories impacting their lives through media channels. Gong et al. [56] echoed this conclusion as mentioned earlier, suggesting that an increase in self-efficacy could be triggered by heightened media attention and media dependency observed among the populace in the context of the COVID-19 pandemic. This study focuses on the impact of social media dependency on self-efficacy in urban flooding disaster contexts. Hence, the following hypothesis is proposed:

H2: Social media dependency positively affects self-efficacy in urban flood information sharing behaviour.

Ball-Rokeach and DeFleur [57] highlighted that the greater the reliance of an individual on the media for fulfilling needs or wants, the more important the role of the media becomes in that person's life and the more significant the impact on that person. In this study, social media dependency, which promotes individuals' attitude change, is proposed as an imperative media factor affecting individuals' intention to share urban flood information on a micro level.

Recently, several studies have found significant relationships between media dependence and individuals' intentions and behaviour regarding information. For example, [58] revealed that media usage predicts green buying and civic engagement behavioural intentions, which aligns with previous perspectives on the importance of the media in shaping public opinion and personal or collective behaviour [59]. Moreover, Wang and Xiong's [60] findings confirmed that social media dependency significantly influences mobile social media usage intention, with those individuals exhibiting higher levels of social media dependency being more inclined to use social media during public health crises. These findings suggest directly that the stronger a person's dependency on media, the more substantial the effect of media in then shaping the person's intention and behaviour. Hence, the hypothesis is proposed that social media dependency is an imperative media factor affecting individuals' intention to share urban flood information.

H3: Social media dependency positively affects the intention to share urban flood information.

In PMT, the protection motivation coordinates actions taken in the face of danger by guiding actions towards protecting oneself from danger [61]. Two pivotal factors in this cognitive process—threat appraisal and coping appraisal—predict how behavioural intention transforms into protection behaviours. It is of particular note, according to previous literature reviews, that perceived severity has been regarded as the effective predictor of flood mitigation intentions and behaviour [62]. Similarly, research conducted by Babcicky and Seebauer [40] in Germany and France on flood risk mitigation behaviours indicates that self-efficacy is another highly significant predictor of such behaviours. This evidence allows for the inference that preventive behavioural intention is more likely inspired by key components such as perceived severity and self-efficacy in disasters, thereby awakening protective behavioural intention and motivating protective behaviours. Hence, the following hypotheses were proposed:

H4: Perceived severity positively promotes urban flood information–sharing intention towards urban flood information sharing behaviour.

H5: Self-efficacy significantly and positively affects urban flood information–sharing intention towards urban flood information sharing behaviour.

H6: Urban flood information sharing intention positively affects urban flood information sharing behaviour.

Wright and Ball-Rokeach [63] mentioned that higher levels of media dependency had been shown with higher levels of attention during exposure, higher levels of effect for a message and its senders, and a greater likelihood of post-exposure communication over the message. As early as the terrorist attacks on September 11, 2004, Lowrey surveyed citizens of an American city to investigate media dependency, indicating that media dependency was a strong predictor of changes in respondents' behaviours and attitudes [48].

Drawing from media system dependency, sharing information during emergencies is seen as a behaviour that uses information exchange to reduce uncertainty brought by disaster environments. This behaviour may fulfil individual psychological needs and bolster their self-protective capacities in the face of imminent adverse circumstances. Therefore, the following hypothesis were proposed:

H7: Social media dependency positively affects urban flood information sharing behaviour.

4. Methodology

4.1. Survey Design, Target Population and Sample Size

This study employed a cross-sectional survey. All questionnaires from this study were distributed through the Credamo (https://www.credamo.com) online survey platform. Since social media user groups in Henan may have experienced extrame urban floods in 2021, the social significance of research on youth in Henan Province is enormous. Hence, the questionnaire was encompassed young social media users aged 18–29 from Henan Province, China.

The number of samples drawn in this study was $n \approx 384.16$. Considering a 95% confidence level and 5% as an acceptable sampling error, a sample size of 600 was sufficient for this study. It is noteworthy that, to ensure that the age range of survey participants aligned with the research scope and that they were social media users who reside in Henan Province, this study employed the age filtering feature built into the survey platform, electronic geofencing functionality and additional multiple filtering questions.

5. Results

5.1. Descriptive Results

A total of 688 surveys were gathered and 613 questions were valid, with an 89% qualification rate, after 75 disqualified questionnaires were eliminated due to unqualified answers, discrepancies or less time spent. The results of descriptive statistics are also provided in this study, including means (M) and standard deviations (SD), as shown in Table 1. The mean value of social media dependency was the highest (M = 4.147, SD = 0.675), while urban flood information sharing behaviour had the lowest mean value (M = 3.470, SD = 0.938). The SD of the variables ranged from 0.597 to 0.938, all within the range of ±2, which met the criteria for a normal distribution of data.

Table 1. Descriptive Statistics of Measured Variables

Descriptive Statistics Variables	N	M	SD
Social media dependency (SMD)	613	4.147	0.675
Perceived severity (PS)	613	4.052	0.597
Self-efficacy (SE)	613	3.664	0.735
Urban flood information sharing intention (INT)	613	3.722	0.723
Urban flood information sharing behaviour (ISB)	613	3.470	0.938

Note: SMD ➞ Social media dependency, PS ➞ Perceived severity, SE ➞ Self-efficacy, INT ➞ Urban flood information ‑ sharing intention, ISB ➞ Urban flood information sharing behaviour.

5.2. Measurement Model

The study adopted partial least squares (structural equation modelling (SEM)) to analyse the hypotheses that have been formulated, employing Smart-PLS (version 4.0) software for assessment. This can be attributed to the SEM method's enhanced capacity to evaluate structural model relationships and the validity and reliability of multi-item concept measurements [64]. Table 2 shows each construct's factor loadings, Cronbach's alpha, composite reliability (CR) and average variance extracted (AVE) values. The Cronbach's alpha values ranged from 0.834 to 0.903 and the CR values ranged between 0.879 and 0.927, indicating that all constructs were reliable [65]. All factor loadings exceeded 0.7 and the items' AVE were all above 0.5, which presented satisfactory convergent validity [66].

Assessment of discriminant validity is now a widely accepted prerequisite when assessing the connections between latent variables [67]. The Fornell–Larcker criterion and the Heterotrait–Monotrait ratio (HTMT) are both proven to have informative discriminant validity [68]. Table 3 shows that the outcomes of the Fornell–Larcker criterion indicated that all diagonal values exceeded 0.700 [69]. Meanwhile, the HTMT discriminant criterion has been satisfied (See Table 4), as all the values are below 0.85 or 0.90 cut-off scores [66]. Moreover, Table 5 shows that the VIF for all variables is above 1.000 but below 5.0, indicating no collinearity problem among the variables in this study.

Table 2. List of Factor Loadings Construct Reliability and Validity

	Items	Loading	Cronbach's alpha	Composite reliability	AVE
Social media dependency	SMD1	0.842	0.879	0.917	0.733
	SMD2	0.858			
	SMD3	0.859			
	SMD4	0.866			
Perceived severity	PS1	0.784	0.834	0.879	0.550
	PS2	0.631			
	PS3	0.822			
	PS4	0.671			
	PS5	0.824			
	PS6	0.697			
Self-efficacy	SE1	0.800	0.895	0.920	0.657
	SE2	0.815			
	SE3	0.857			
	SE4	0.804			
	SE5	0.848			
	SE6	0.733			
Urban flood information sharing intention	INT1	0.823	0.903	0.926	0.675
	INT2	0.860			
	INT3	0.833			
	INT4	0.848			
	INT5	0.769			
	INT6	0.793			
Urban flood information sharing behaviour	ISB1	0.916	0.881	0.927	0.808
	ISB2	0.893			
	ISB3	0.888			

Note: AVE → average variance extracted, CR → composite reliability.

Table 3. Discriminant Validity (Fornell–Larcker Criterion)

	INT	ISB	PS	SE	SMD
INT	0.822				
ISB	0.684	0.899			
PS	0.554	0.370	0.742		
SE	0.437	0.328	0.452	0.811	
SMD	0.538	0.364	0.672	0.497	0.856

Table 4. Heterotrait–Monotrait (HTMT) Criterion

	INT	ISB	PS	SE	SMD
INT					
ISB	0.766				
PS	0.642	0.435			
SE	0.485	0.368	0.529		
SMD	0.603	0.412	0.771	0.557	

Table 5. Collinearity Statistics (VIF)

Dependent variable	Independent Variables	Variance Inflation Factor
SMD	PS	1.000
SMD	SE	1.000
SMD	INT	1.994
PS	INT	1.887
SE	INT	1.374
INT	ISB	1.409
SMD	ISB	1.409

5.3. Hypotheses Testing

This study examines seven direct hypotheses in total, as shown in Table 6. All the direct relationships (H1–H6) presented significant positive effects with *p*-values less than 0.001 and beta values 0.672 (H1), 0.497 (H2), 0.241 (H3), 0.341 (H4),0.175 (H5),0.688 (H6). The relationship between social media dependency and urban flood information–sharing behaviour is not statistically significant at the 10% significance level ($\beta = -0.007$, $t = 0.184$, $p = 0.854$). The *t*-value in H7, which determines the hypothesis's acceptance or rejection, is 0.184, lower than the satisfactory value of 1.6. Simultaneously, the value zero (0) falls inside the confidence interval, indicating that hypothesis seven (H7) is invalid and subsequently rejected.

Alongside the analysis of the structural model, the Coefficient of Determination (R^2) and Predictive Relevance (Q^2) in Table 7, and the effect sizes (f^2) in Table 8 were also assessed. The urban flood information sharing behaviour has an R^2 value of 0.468, which presents a moderate effect. It implies that 46.8% of variations in urban flood information sharing behaviour can be explained by social media dependency and urban flood information–sharing intention. In contrast, the link between social media dependency and self-efficacy presents a weak coefficient of determination of 0.247 ($R^2 = 0.247$). Concerning predictive relevance (Q^2), Table 7 indicates that urban flood information sharing behaviour has the highest Q^2 value of 0.374 ($Q^2 = 0.374$), while self-efficacy shows a relatively low predictive relevance ($Q^2 = 0.157$). Overall, all Q^2 values are above zero, suggesting that the endogenous constructs of the model demonstrate predictive relevance [65]. In addition to this, according to the scale of the effect sizes (f^2), small (0.02), medium (0.15) and large (0.35) [70]. The effect sizes of H1 and H6 are large, while small effect sizes have been found in H3, H4 and H5 (Table 8). Additionally, all the path coefficients and R^2 in the structural model are shown in Figure 2.

Table 6. Path Coefficient of Hypothesis

Hypothesis	**Relationship**	**Std. beta (β)**	**Std. dev**	***t*-value**	***p*-value**	**LCI**	**UCI**	**Decision**
H1	SMD → PS	0.672	0.039	17.130	0	0.582	0.740	Accepted
H2	SMD → SE	0.497	0.045	11.064	0	0.402	0.578	Accepted
H3	SMD → INT	0.241	0.052	4.603	0	0.140	0.345	Accepted
H4	PS → INT	0.314	0.050	6.219	0	0.208	0.408	Accepted
H5	SE → INT	0.175	0.043	4.113	0	0.092	0.258	Accepted
H6	INT→ISB	0.688	0.039	17.860	0	0.608	0.758	Accepted
H7	SMD → ISB	−0.007	0.038	0.184	0.854	−0.079	0.071	Rejected

Table 7. Model Results for R^2 and Q^2

Dependent Variables	R^2	Q^2
INT	0.380	0.251
ISB	0.468	0.374
PS	0.452	0.240
SE	0.247	0.157

Table 8. Effect Size *f*2

Hypothesis/Relationship		Decision	f^2	Effect
H1	SMD→PS	Accepted	0.823	Large
H2	SMD→SE	Accepted	0.328	Medium
H3	SMD→ INT	Accepted	0.047	Small
H4	PS→INT	Accepted	0.084	Small
H5	SE→INT	Accepted	0.036	Small
H6	INT→ISB	Accepted	0.632	Large
H7	SMD→ISB	Rejected	0.000	None

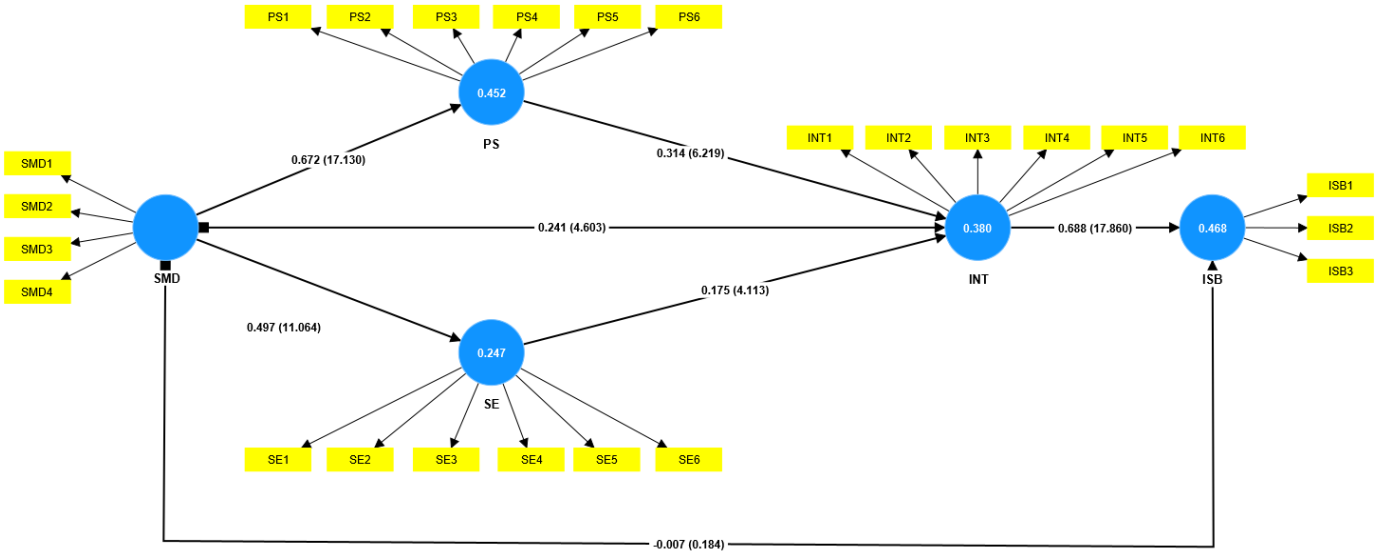

Figure 2. Structural Model with Path Coefficient (β + t-value) and R2

6. Discussion

This study examines the factors influencing 'young adults' intentions and behaviours in sharing urban flood information on social media in Henan, China. The research hypothesis was developed from PMT and incorporates social media dependency as a key independent variable. According to the results of the study, SMD can be a key factor influencing PMT components (perceived severity and perceived efficacy), which coincided with the previous findings in a disaster context [5,40,56,60].

The positive relationship between social media dependency and self-efficacy or perceived severity was confirmed in this study. Social media's continuous coverage of urban floods has enhanced the perceived severity of these events. This aligns with the findings of Kankanamge et al. [5], who noted that users can sense the severity of a hazard through post content and geolocation tags on social media. In parallel, given that interpersonal communication is a primary source of perceived efficacy [71]. The relatively free discourse environment on social media provides users with a platform to discuss disaster situations, enhancing their perceived efficacy levels.

Interestingly, from the time of this survey, 'young adults' self-efficacy and perception of severity have remained at a considerable level for an extended period following the 2021 urban flood disaster. Given the frequent occurrence of minor urban flooding in Henan, it can be inferred that social media has become a vital platform for young adults in Henan to seek assistance and obtain information about flood conditions. Additionally, by ranking the direct effects of social media dependency according to either the path coefficients of SEM or effect size analysis, social media dependency showed the most profound influence on perceived severity. By implication, therefore, social media can serve as a platform for issuing flood warnings and can be used in parallel with other warning systems, thereby enhancing the public's ability to prevent and respond to flood disasters.

Furthermore, the results of the analysis showed that when social media is the dominant information source, social media dependency is a significant variable in explaining the strong intention to share urban flood information with others. Prior research has indicated that the degree of reliance on online and social media sources for risk information is foundational in determining whether and how individuals respond to specific risks. However, Lin et al. elucidated that disaster information influences individuals' responses to and preferences for risk prevention, thereby deepening their intention to emulate others' planned behaviours. Users who rely on social media for news, information and communication also tend to mimic the intentions and

behaviours of other users [72,73]. Misleading information or fake news can result in ineffective disaster responses, highlighting the importance of the accuracy and integrity of shared information. Nonetheless, it must be acknowledged that social media has provided a crucial avenue for accessing vital rescue information during urban flood disasters.

However, the present study found no relationship between social media dependency and urban flood information–sharing behaviour ($\beta = -0.007$, $t = 0.184$, $p = 0.854$). Contrary to the initial hypothesis of this study, for young respondents in Henan Province, social media dependency was not associated with sharing urban flood information ($\beta = -0.007$, $t = 0.184$, $p = 0.854$). In other words, social media dependency does not facilitate the sharing of urban flood information, which is inconsistent with the similar hypotheses proposed in Li et al.'s study. Boas et al. [74] found that weather forecasts or warning information shared on social media were mainly obtained from authoritative sources. People are seen to treat with considerable scepticism unofficial and unverified information. Multiple previous studies have similarly shown that during extreme events, particularly within the socio-political context of China, individuals prefer to obtain critical information from the government or authoritative social media accounts [75–77]. Far more than that, China adopts a top-down organisational approach to disaster information management, and individual online dissemination of weather alerts and warnings is strictly regulated by corresponding censorship legislation. The mechanisms and supporting policies for using social media by individual accounts in disseminating disaster information remain obscure, leaving a lack of platforms for exchanging and integrating disaster information between government and citizens. Disaster information posted on authoritative social media accounts has so far been neither clear nor adequate [78,79]. This inadequacy of shared information made it difficult for the public to assess the disaster's progression, evaluate their situation and implement response measures. Given these circumstances, it is not surprising that mainstream social media users did not recognise or implement the sharing of urban flood information.

7. Theoretical Contributions and Practical Contributions

The main theoretical contribution of this study lies in taking social media dependency as a starting point and addressing the intentions and behaviours of sharing information on social media within the context of urban floods through the PMT. In this study, the interpretation of relevant psychological factors in the motivation for protection in disaster communication has been demonstrated to be feasible through the perspective of social media dependency. Regardless of its limitations, this study extends the growing reservoir of literature on social media information sharing during disasters such as urban floods. Hence, the mechanisms of disaster information sharing deserve further exploration.

The practical contributions of this study include highlighting that urban flood information sharing may become a crucial method for urban flood victims to assist each other in overcoming crises. Consequently, disaster emergency management organisations and civil rescue groups may pay more attention to calls for help on social media, thus helping those in greatest need. Furthermore, we encourage authorities to use social media platforms such as WeChat and Weibo to issue flood warnings and updates on disaster progress. Actively leveraging social media information sharing, such as establishing aid discussion boards hosted by official entities, not only provides more direct feedback and support to those affected but also offers crucial hazard avoidance information to potential disaster victims.

8. Limitations and Recommendations for Future Research

First, the analysis of this study was limited by the cross-sectional nature of the data, which were gathered over a short period. An individual's sense of dependency on social media and perception of the urban flood may vary over time. Hence, it is imperative to conduct a longitudinal analysis over a specific duration of usage when examining a dynamic process in detail. In addition, future research could apply experimental research to explore relationships between social media dependency on different information types and sharing behaviours.

Second, the PMT has been widely criticised for its failure to consider the public's heterogeneity, where the protection motivation is potentially affected by variations in vulnerability, severity perception and risk resilience from different groups [80]. The transtheoretical model (TTM) has been employed to scrutinise behavioural changes and posits that a set of variables (such as those derived from PMT) will impact different individuals in distinct ways [81]. With TTM classification, it is possible to pinpoint the factors (e.g. perceived vulnerability) that elucidate the effective methods of communication for each specific subgroup [82].

In addition, individuals with inherent biases may choose to be included in the sample. The value of research depends on its ability to extrapolate the findings from a given sample to a significant population [83]. The lack of support in this study for the impact of urban flood information–sharing behaviour may be attributed to the hypothetical analysis of social media dependency rather than actual behaviour or personal experience. To address this constraint, qualitative data obtained from focused group discussions and in-depth interviews can be used to determine the extent of media dependency and reveal other possible issues not tackled in this survey. Therefore, the researchers recommend that henceforth, prospective research initiatives use a mixed sequential method analysis to examine the relationship between social media dependency and urban flood information sharing.

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