Details of modification

Dear reviewers,

We would like to thank the reviewers for his/her interest in our work for their effort, constructive criticism and suggestion. We appreciate the insightful comments, as these would contribute to improving the manuscript's robustness and quality. We provide a point-by-point reply to the general and specific comments raised as follows:

REVIEWER 1:

As you can see the reviewers have re-reviewed your manuscript and have come to a mixed conclusion and so I have stepped in to provide a third opinion. I have reviewed the paper and have come to the conclusion that there is an interesting story in here for readers of NHESS and this is a large survey which can significantly add to the body of literature in this area. Therefore I encourage you to revise your manuscript and resubmit for further review. In doing so however please take a very careful approach to address each and every point in the review from both reviewers, as well as the additional points below..

My analysis of the paper highlights the following major issues to address:

1. this paper has become unwieldy with the presentation – there are significant numbers of tables (13) on top of 9 figures. This may have something to do with a misplaced 'supplementary materials' section - nonetheless this should be significantly revised

Reply: Thanks greatly for your valuable suggestions. We have reduced the number of forms from 13 to 11. We have placed this table about socio-economic features in respondents and descriptive statistics of each indicator and variable in the supplementary material section.

2. The English is poor – an English language editor is required after some significant editing

Reply: Thank you for your suggestions. We have polished the language style of this article and made it more understandable and concise. And this modification could be seen in the overall expression in the revised paper.

3. The discussion section would benefit from structure.

Reply: Thank you for your suggestions. In the Discussion section, we found that people relied more on threat appraisal to perceive risk and failed to trigger high enough coping appraisal. Insufficient risk perception led to strenuous transform into flood preparedness with unbalanced relationship. Groups with social-economic features showed different preferences to achieve risk perception and flood preparedness. And threat appraisal transformed into flood preparedness under the effect of response intention and social-economic features. Groups with high education level or bad health would more probably perceive risk and take preventive behavior. These findings could provide critical insights into intervention strategies for enhancing public flood preparedness in flood management. But this study only found the influence path in part of factors and results may not be generalized in all socio-economic characteristics. Rationality and reliability of influence path need further empirical validation in future studies. With the climate change, the adoption of different behaviors was significantly influenced by how individuals perceive and evaluate risk. When risk events were associated with adequate benefits, individuals tended to exhibit a preference for adaptive behaviors. Consequently, a thorough analysis of benefits and costs was crucial in understanding risk perception and preparedness. And this modification could be seen in the

revised paper (page 32-36, line 548-632).

This study found no significant gender difference in risk perception; however, females exhibited a higher level of flood preparedness, consistent with previous research (Rana et al., 2020; Rasool et al., 2022). Individuals who regularly exercised demonstrated higher risk perception, mainly because adequate physical activity enhanced their response and judgment capabilities, leading to more active cognitive functions. The elderly, particularly those aged 51-60 and above 60, showed higher risk perception but lower flood preparedness. As socially vulnerable groups, the elderly were more likely to perceive flood risk (Harlan et al., 2019), yet struggled with practical responses due to insufficient fitness and reaction capabilities. Individuals with lower education levels displayed higher risk perception, while those with higher education levels showed greater flood preparedness. People with lower educational attainment often have lower social status and are more likely to engage in hazardous occupations, motivating them to proactively perceive flood risks (Bollettino et al., 2020; Kiani et al., 2022). But highly educated individuals could access diverse information about disasters and prepare adequately for floods (Rana et al., 2020). Long living time made people become acquainted with local conditions, leading to a positive perception of flood risk. Those who experienced and worried about floods tended to perceive higher risks and made adequate preparations. Past flood experiences triggered risk perception and a greater intention to take preventive actions (Ao et al., 2020). Individuals were more likely to report higher risk perception and preparedness when floods were associated with negative emotions or memories (Rufat and Botzen, 2022).

Enough high threat appraisal could trigger coping appraisal (Schlef et al., 2018), leading to increased protection motivation and promoting mitigation measures (Kurata et al., 2022). However, our results indicate that even with high threat appraisal and moderate coping appraisal, the threat appraisal may not reach the threshold necessary to effectively trigger coping appraisal. And coping appraisal had no significant effect on flood preparedness in our study. Individuals tended to rely predominantly on threat appraisal to perceive risk, often failing to generate an adequate coping appraisal, which resulted in insufficient risk perception. Thus, risk perception struggled to translate into effective flood preparedness due to this imbalanced relationship. The influence of threat appraisal on flood preparedness was greater in groups with low risk perception compared to those with high risk perception. The transformation of low risk perception into flood preparedness could be attributed to the relatively stronger effect of threat appraisal on flood preparedness. The association between high risk perception and low flood preparedness might stem from the weaker effect of threat appraisal on flood preparedness. However, due to the significant influence of other factors, such as government trust, individuals within groups exhibiting high levels of risk perception were more likely to demonstrate greater preparedness for floods.

Various socio-economic characteristics influenced individual preferences for different methods of achieving risk perception and flood preparedness. Females exhibited higher levels of flood worry and relied more on flood knowledge to perceive risk than males, possibly due to the general cognition that women are more vulnerable and sensitive (Eryılmaz Türkkan and Hırca, 2021). Females were suggested to keep calm, and improve risk perception through flood knowledge. The elderly depended on both flood knowledge and worry for risk perception. Although they demonstrated a greater influence of government trust on flood preparedness, lower levels of government trust could potentially hinder their efforts in flood preparedness. Individuals with low education levels preferred using flood knowledge for risk perception and were advised to enhance their trust in the government to improve flood preparedness. Those with longer residence durations relied more on flood knowledge for risk perception, while individuals with shorter living times, unfamiliar with local floods, depended more on government trust for risk perception and favored threat appraisal to achieve flood preparedness. Groups with poor health relied more on flood knowledge for flood preparedness as adequate risk knowledge could compensate for physical functional limitations. Individuals who regularly exercised showed a preference for threat appraisal in preparing for floods. Moreover, individuals with bad habits, considered psychologically fragile and sensitive, preferred flood risk worry and knowledge and government trust for risk perception.

In our study, risk perception, including both threat and coping appraisal, directly influenced flood preparedness, with response intention exhibiting a mediating effect. Socio-economic factors, especially education level and health condition, played a moderating effect between risk perception and flood preparedness. Individuals with higher education levels were better equipped to process complex information and act promptly during the time lag between action and outcome (Dootson et al., 2022). As health condition improved, there was a negative predictive effect of threat appraisal on flood preparedness. Although people reporting good health displayed confidence in their physical function, overconfidence could impede the translation of risk perception into preparedness (Bollettino et al., 2020). These groups should attach importance to timely feedback in response to floods. Among males, despite lower levels of flood preparedness, threat and coping appraisal were stronger predictors of flood preparedness. With the effect of response intention and socio-economic factors, risk perception could transform into flood preparedness, leading to differences in preventive and adaptive behaviors. Individuals with higher education levels were more likely to perceive risk and engage in preventive behavior against flooding. Conversely, groups with poorer health were more likely to perceive flood risks and adopt preventive measures.

This study revealed the influence of socio-economic factors on risk perception and flood preparedness. But we only found the influence path from a part of factors, and results may not be generalized to all socio-economic characteristics. The rationality and reliability of the identified influence paths require further empirical validation in future research. Due to climate change, the adoption of different behaviors is significantly influenced by how individuals perceive and evaluate risk (Bodoque et al., 2019). When risk events are associated with adequate benefits, individuals tend to prefer adaptive behaviors (Zhang et al., 2021b). Consequently, a comprehensive analysis of benefits and costs is crucial for understanding risk perception and preparedness.