Suicide, self-injury and violence

Kexin Zhang, Ziyang Wang, Xin Yu

To the editor:

Non-suicidal self-injury (NSSI) is defined as direct, repetitive self-injury to bodily tissues without suicidal intent. The estimated prevalence of NSSI among adolescents is 17.2% worldwide with a comparable rate observed in China. As a behavioural addiction, NSSI poses a significant suicide risk, and is emerging as a major mental health problem among adolescents. To unravel this puzzle, the four-function model (FFM) distinguishes between interpersonal and intrapersonal functions, as well as positive and negative reinforcement functions, proving relatively comprehensive among various theoretical models.

Despite its high prevalence rates and serious influences, adolescents and young adults with NSSI often seek information and social support online rather than offline from doctors or other professionals. One-third of young people with a history of self-injury report online help-seeking for self-injury. As of June 2023, China has a huge adolescent internet user base of close to 150 million. However, a limited number of studies have explored NSSI and online information-seeking and help-seeking in the Chinese context.

Social media sites have raised concerns due to the presence of NSSI-related content. As one of the most commonly used social media platforms among Chinese users, Sina Weibo (Weibo hereafter) has a large user base with a large amount of user-generated content. The content on Weibo is mostly the self-expression of users, with pictures and text as the main focus, and the text content is limited to 140 Chinese characters, fostering an open content ecosystem. This study investigates ambiguous NSSI-related terms on Weibo. To our knowledge, this is the first published study to explore NSSI-related terms on a Chinese-language social network. The purposes of the current study are (1) to explore the meaning and consistency of ambiguous language use; (2) to explore the general social opinions towards NSSI on Weibo and (3) to apply the FFM to examine the underlying functions of NSSI for content creators. We hope that this study aids in identifying the potential indicators of NSSI activity and facilitates further interventions.

METHODS AND RESULTS

The process of data collection and the results of data classification are shown in online supplemental figure 1. Based on these data, we analysed the demographic and linguistic characteristics of users who posted NSSI-related content and collected frequently used NSSI-related argot and slang. These terms, along with our search keywords, are presented in table 1.

Descriptive statistics on user characteristics and the status of posts

A total of 2343 non-repeated user identifications (IDs) were identified; the vast majority self-declared as female (73.15%, n=1714) followed by male (20.74%, n=486), and a minority were anonymous (n=143, 6.10%). Among users with identifiable age, 20.68% were under 18 and 57.89% were under 22 years old, with a mean standard deviation (SD) age of 23.53 (10.29) years. In terms of account influence, the average number of accounts they followed was 337.55 (475.48) and the median was 184; the average number of followers was 3488.36 (417590.63) and the median was 53. Sixty-two users had more than 10 000 followers, of which 41 were ‘robot accounts’ (platforms for anonymous submissions). A total of 1032 Weibo posts have comments, accounting for 37.02%. The average number of ‘likes’ was 8.16 (72.61).

NSSI-related argot and slang

A set of vocabulary that represents practices of shared meaning-making could be confusing for people who come across the ‘imagined communities’ on Weibo. Most of these obviously follow the rules of consonance.
## Table 1  Meaning and composition rules of search keywords and selected NSSI-specific terms

<table>
<thead>
<tr>
<th>Classification</th>
<th>Keywords</th>
<th>Meaning</th>
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<tbody>
<tr>
<td>Search keywords</td>
<td>“自餐” Self-mutilation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“zican” Self-mutilation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“字餐” Self-mutilation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“紫餐” Self-mutilation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“紫伤” Self-injury</td>
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<tr>
<td></td>
<td>“自动” Self-injury</td>
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<td></td>
<td>“自残” Self-mutilation</td>
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<tr>
<td></td>
<td>“自伤” Self-injury</td>
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<tr>
<td></td>
<td>“自虐” Self-torture</td>
<td></td>
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<tr>
<td></td>
<td>“雪兔” Picture containing bleeding scene</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“雪图” Picture containing bleeding scene</td>
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<tr>
<td></td>
<td>“出雪” Bleeding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“雪珠” Blood drop</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“自己” Self</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“皮肤” Skin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“身体” Body</td>
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</tr>
<tr>
<td></td>
<td>“手” Hand</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“美工刀” Utility knife</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“刀片” Razor blade</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“圓規” Compass</td>
<td></td>
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<tr>
<td></td>
<td>“烟头” Cigarette</td>
<td></td>
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<tr>
<td></td>
<td>“切” Cut</td>
<td></td>
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<tr>
<td></td>
<td>“割” Cut</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“划” Cut</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“血” Blood</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“割” Stab</td>
<td></td>
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<tr>
<td></td>
<td>“烫” Scald</td>
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</tr>
<tr>
<td></td>
<td>(And the combinations of above words)</td>
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</tbody>
</table>

### NSSI-specific terms

- **A term derived from pinyin (Chinese romanisation) or homonym in Chinese**
  - “紫参” (Zi Can) Self-injury; ‘Zi’ means ‘self’ and ‘Can’ means ‘mutilation’
  - “Zican” Self-injury in Chinese phonetic alphabets, homonym for ‘Zi Can’
  - “餐券” (Can Quan) A community of individuals with NSSI behaviours; ‘Quan’ means ‘group’
  - “雪兔” (Xue Tu) NSSI-related pictures with blood; ‘Xue’ means ‘blood’ and ‘Tu’ means ‘image’
  - “歌手” (Ge Shou) Cut skin with a razor blade; ‘Ge’ means ‘cut’ and ‘Shou’ means ‘hand’
  - “玉玉” (Yu Yu) Depression; ‘Yu Yu’ is very similar to the pinyin of depression in Chinese language, ‘Yi Yu’

- **A term derived from English pronunciation**
  - “欧弟” (Ou Di) Overdose

- **A term derived from a particular image within the imagined community**
  - “吐黑泥” Vent negative feelings through writing
  - “面角” To build and complete a platform together
  - “散列” To follow each other, make friends and increase the number of followers of one’s account
  - “凉席印” Relatively shallow wounds and scars
  - “厕” A communication platform for people who share a non-mainstream characteristic, including but not limited to NSSI

- **Combination of pinyin derivation and image derivation**
  - “紫餐厕” A communication platform for individuals with NSSI behaviours

NSSI, non-suicidal self-injury.
However, others require more intricate knowledge of the language used in a community. For example, ‘凉席印’ means relatively shallow wounds and scars resembling an imprint after sleeping on a bamboo mat. This term could be used to describe self-injury behaviours with contempt. Terms related to such covert language or argot are listed in Table 1.

NSSI-related behaviour on Weibo and the FFM
We used the FFM to classify NSSI-related posts into two dichotomous categories, based on a previous study. The results of the qualitative analysis are shown below.

The third-person perspective
Among Weibo texts marked as the third-person pronoun perspective (N=634, 22.74%), some expressed positive attitudes towards NSSI behaviours (N=278, 9.97%), but more expressed negative attitudes (N=320, 11.48%). Most texts with positive attitudes supported and beautified NSSI behaviours, and few provided help or guided those users with NSSI behaviours to seek medical support (N<10).

The first-person perspective
Self-negative motivation (N=1058, 37.95%) was the highest of all motivations. Some used texts to describe how negative emotions such as pain and anxiety could be relieved by NSSI. Some wrote diary-type logs recording entries of events and emotions before and after a particular NSSI behaviour or behaviours. Some described their own treatment history regarding mental illnesses such as anxiety, depression and bipolar disorder. Some directly described the pain of quitting NSSI addictive behaviours. We found that NSSI behaviours appeared alongside impulsive self-destructive behaviours such as smoking and drinking, substance abuse and overeating in ‘regulating emotions’.

Self-positive motivation (N=409, 14.67%) focused on describing the visual and sensory stimuli during NSSI and the rewards of finding a sense of control through pain. Also, expectations for NSSI behaviours (eg, purchasing desired tools, creating appropriate environmental conditions, etc) are included in these texts, as well as feelings of curiosity at the time of first attempts.

Social negative motivation (N=26, 0.93%) had little exposure in social media, with few actively mentioning their avoidance of responsibility in their texts.

Social positive motivation (N=358, 12.84%) was achieved by expressing information about NSSI of oneself on social media, in order to communicate on an equal footing and receive attention or welcome from others. There were also many posts complaining that their images or videos had not been approved on Weibo and exchanging strategies for the publication of these images or videos.

Statistical analyses
A Jonckheere-Terpstra test was conducted and showed that female users have a significantly higher number of posts than their male counterparts (TJT =28.00, p=0.035).

Moreover, from the third-person perspective, positive attitudes are significantly higher than negative attitudes (TJT=3.00, p=0.020). According to a Kruskal-Wallis test, the number of automatic functions is significantly higher than that of social functions (H=4.88, p=0.027). There is no significant difference between positive and negative attitudes in either automatic (TJT=8.00, p=0.222) or social facts (TJT=9.00, p=0.317) after the Jonckheere-Terpstra test.

DISCUSSION
Characteristics of users and NSSI-related posts
Preliminary statistics indicated that the average age and the higher occurrence of NSSI-related activity among self-declared females aligned well with previously reported peak prevalence rates. Furthermore, it should be noted that a few NSSI-related posts were posted anonymously by ‘robot accounts’, which accounted for 6.10% of the focal accounts and 8.79% of the focal posts. Anonymity can serve as protection against stigmatisation, allay fears of confidentiality breaches and reduce concerns about being labelled as attention-seeking. By bringing together similar life experiences, ‘robot accounts’ enable contributors and readers to obtain a sense of belonging and social support that may be lacking in their real-life interactions. Moreover, anonymous self-disclosure reduces the possibility of cyberbullying.

Understanding the language of NSSI on Weibo
The phenomenon of practice-specific vocabulary in these ‘imagined communities’ has been discussed regarding platforms such as Tumblr. First, such a set of vocabulary can effectively circumvent censorship on the platform. Second, it can help create an in-group feeling of belonging. In addition, as the first barrier to entry into the group, it facilitates the identification of NSSI-related content and groups and helps users build their own group of social networks. These reasons promote the development of this language among niche groups.

In the Chinese language context, the development of jargon relies heavily on homophony and pinyin. This may be related to the individuals’ sense of shame regarding the topic, whereby they use alternative forms of verbal expression to create psychological distance from, normalise or even beautify their behaviours to enhance their self-identity. Whether viewed from the perspective of society or individuals, the emergence of this subculture serves to transform a behaviour that is typically deemed socially unacceptable into a subtle form of self-help. This includes alleviating personal stress and seeking support from peers. Given the rebellious, boundary-pushing nature of subcultures, it is possible that young individuals who are still navigating their way through life may adopt this subculture as the prevailing norm, consequently heightening the risk of NSSI prevalence. Accordingly, the statement and summary of this phenomenon aim to facilitate the identification of (online) self-injury activities.
and enhance the understanding of the importance of communicating NSSI-related experiences.

**Social attitude towards NSSI**

The influences of social media on NSSI-related indicators extend to both peers and media. In this study, negative attitudes towards NSSI outweighed positive attitudes, suggesting that most people hold negative views about NSSI behaviours. Social exclusion can hinder individuals’ perceived social support, which is a risk factor for NSSI.\(^\text{13}\) While the internet offers a relatively safe communication platform for individuals with NSSI behaviours, the content they post is often used by others to perpetuate or increase hostility and stigma towards their group. This dynamic not only influences the emotions of individuals with NSSI behaviours but also amplifies their social isolation and reduces the likelihood of seeking help offline.

However, some posts, categorised as having positive attitudes towards NSSI behaviour, were empathetic and supportive, and even requested more pictures with increasing severity of wounds. This creates internal reinforcement for individuals with NSSI behaviours, enabling them to gain more social validation and encouragement. Additionally, it fosters external reinforcement, promoting the formation of NSSI subcultural groups and gradually raising the barriers to joining these groups in a process of ‘comparison of self-mutilation’, as described in the following section on the signs of social reinforcement.

Notably, one category of posts featured creative expressions, for instance, creative writing, memes or artwork (drawn or photoshopped images), previously observed on Tumblr.\(^\text{10}\) The combination of expressions and artwork aestheticises trauma or traumatic events. This externalisation of personal experiences serves as a means to promote social engagement and shared meaning-making.

**Automatic-oriented and social-oriented motivations of NSSI-related self-exposure**

Automatic-oriented motivation is the most dominant category among all the posts, directly presenting streams of negative emotions and indicating how they use NSSI as a tool for emotional regulation. Such disclosures may normalise NSSI for the users, making it a routine and acceptable response to emotions they find difficult to handle.\(^\text{14}\) Social-oriented disclosures, such as sharing methods for performing NSSI, wound disinfection and hiding scars, could also discourage seeking medical support.

Beyond the risk of increasing prevalence through social reinforcement, multiple reasons highlight the importance of media guidelines for NSSI. Notably, many social media platforms, including Weibo, have banned NSSI-related hashtags, potentially causing bias in our study. However, our results confirm concerns that merely blocking hashtags is not a solution, as new hashtags are created continually and covertly.\(^\text{13}\) The ultimate problem with the NSSI community itself is not self-exposure on social platforms. Despite the large number of posts seeking help, few posts addressed the proper ways to seek help for NSSI behaviour. Individuals struggling with NSSI are still typically unable to access professional guidance and help. This means that the priority in future work should be to increase popular science education concerning mental health and psychiatry.

This study provides a preliminary exploration of social communication and its underlying motivations, although significantly limited by the non-representativeness of a single platform, the inaccuracy of the understanding of short text and the filtering mechanism concerning hashtags on the platform. Further research needs to delve deeper into the motivations driving social communication, increase popular science education concerning mental health and psychiatry, and provide more online resources to support those seeking help and increase their self-awareness to prevent NSSI behaviours.

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**Contributors**

XY supervised the study. ZW wrote the code and crawled the data. KZ designed the study and analysed the data. All the authors contributed to the article and approved the final version for publication.

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**Competing interests**

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

**Patient consent for publication**

Not required.

**Ethics approval**

As the data involved in this study were publicly accessible and no identifying information regarding potential minors was reported, this study was classified as not involving human subjects and was exempt from the Ethics Committee of Peking University Sixth Hospital (ID: 2023-10-12-1), as shown in the Application and Decision Sheet for Exemption Review. The authors assert that all procedures contributing to this work comply with the supplementary guidance published by the British Psychological Society regarding ethics guidelines for internet-mediated research.

**Provenance and peer review**

Not commissioned; externally peer reviewed.

**Data availability statement**

These data have not been published elsewhere.

**Supplemental material**

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Crawl data on Weibo from 01/2020 to 02/2023, remove duplicates (n=17 656)

Train an NLP model (with a manually label train set of size = 3000)

NLP model classification: NSSI-related (n=3211)

Drop 423 irrelevant posts identified by authors

Manually labelled: first or third-person perspective (n=2788)

First-person perspective (n=2154)

Using FFM to classify: automatic/social, positive/unknown/negative.
AP (n=409), AU (n=299), AN (n=1,058), SP (n=358), SU (n=4), SN (n=26)

Third-person perspective (n=634)

Using FFM to classify: positive/unknown/negative.
Positive (n=278), Unknown (n=36), Negative (n=320)