Meeting the Unmet Needs of Individuals With Mental Disorders: Scoping Review on Peer-to-Peer Web-Based Interactions

Dawid Storman¹, MD; Paweł Jemioło², MSc, MA; Mateusz Jan Swierz¹, MD; Zuzanna Sawiec³; Ewa Antonowicz³; Anna Prokop-Dorner⁴, PhD; Marcelina Gotfryd-Burzyńska⁵, MA; Małgorzata M Bala¹, MD, PhD, Prof Dr

¹Chair of Epidemiology and Preventive Medicine, Department of Hygiene and Dietetics, Jagiellonian University Medical College, Krakow, Poland
²AGH University of Science and Technology, Krakow, Poland
³Students’ Scientific Research Group of Systematic Reviews, Jagiellonian University Medical College, Krakow, Poland
⁴Chair of Epidemiology and Preventive Medicine, Jagiellonian University Medical College, Krakow, Poland
⁵Institute of Psychology, Jagiellonian University, Krakow, Poland

Corresponding Author:
Dawid Storman, MD
Chair of Epidemiology and Preventive Medicine
Department of Hygiene and Dietetics
Jagiellonian University Medical College
Kopernika 7a
Krakow, 31-034
Poland
Phone: 48 502846363
Email: dawid.storman@doctoral.uj.edu.pl

Abstract

Background: An increasing number of online support groups are providing advice and information on topics related to mental health.

Objective: This study aimed to investigate the needs that internet users meet through peer-to-peer interactions.

Methods: A search of 4 databases was performed until August 15, 2022. Qualitative or mixed methods (ie, qualitative and quantitative) studies investigating interactions among internet users with mental disorders were included. The φ coefficient was used and machine learning techniques were applied to investigate the associations between the type of mental disorders and web-based interactions linked to seeking help or support.

Results: Of the 13,098 identified records, 44 studies (analyzed in 54 study-disorder pairs) that assessed 82,091 users and 293,103 posts were included. The most frequent interactions were noted for people with eating disorders (14/54, 26%), depression (12/54, 22%), and psychoactive substance use disorders (9/54, 17%). We grouped interactions between users into 42 codes, with the empathy or compassion code being the most common (41/54, 76%). The most frequently coexisting codes were request for information and network (35 times; φ=0.5; P<.001). The algorithms that provided the best accuracy in classifying disorders by interactions were decision trees (44/54, 81%) and logistic regression (40/54, 74%). The included studies were of moderate quality.

Conclusions: People with mental disorders mostly use the internet to seek support, find answers to their questions, and chat. The results of this analysis should be interpreted as a proof of concept. More data on web-based interactions among these people might help apply machine learning methods to develop a tool that might facilitate screening or even support mental health assessment.

(JMIR Ment Health 2022;9(12):e36056) doi: 10.2196/36056

KEYWORDS
scoping review; peer-to-peer interactions; mental disorders; web-based interactions
Introduction

Background

It is estimated that 38.2% of Europeans and 26.2% of Americans experience mental disorders annually [1,2]. Unfortunately, social perception of these disorders is largely based on stereotypes [3]. Despite antistigma campaigns [4], stigmatization and discriminatory practices are reinforced by media discourse that reproduces false and simplified mental representations of people with mental disorders [5-8]. Therefore, many individuals seek information or support on the web. The internet is an essential platform for creating web-based communities that provide a venue to ask questions, share experiences, and offer mutual emotional support [9]. Most studies reporting evidence that websites can provide meaningful help focused on people with physical disorders such as cancer [10], diabetes mellitus [11], and Alzheimer disease [12]. However, research suggests that more attention should be paid to people with psychological conditions, including those who self-harm [13], those who experience eating disorders [14], and those with various other mental disorders [15] because these conditions affect different aspects of daily functioning. According to the literature, people with mental disorders are willing to connect with others using social media [9] even though they have greater difficulties in establishing relationships offline than people without such disorders [16]. This trend was further reinforced during the COVID-19 pandemic when access to face-to-face professional help became limited and was replaced by remote support services [17]. At the same time, the number of internet users grew from 4.1 billion in 2019 to 4.9 billion in 2021 [18], which means that a higher number of people could benefit from our research.

According to several studies, both people who generate content and those who interact with creators may benefit from such an interaction [19-21]. Unlike spontaneous offline meetings, web-based interactions do not require the same level of engagement or instant reactions. Thus, this type of interactions may help people with mental disorders overcome increased levels of social anxiety or face information-processing challenges [22]. This, in turn, may provide a sense of empowerment and lead to shorter recovery times. In addition, the internet can offer anonymity, making web-based interactions with strangers less threatening than in-person contact [23].

Self-esteem is built on several key factors, one of which is a sense of belonging to a group [24]. Therefore, connecting with similar individuals (peers) may result in better recovery and social integration among people with mental disorders [25]. However, stigmatization and rejection can happen even within the communities themselves [26] but also in web-based interactions. Thus, it is critical for internet users with mental disorders to join the right web-based groups to avoid rejection from their peers. Unfortunately, there are still insufficient numbers of mental health professionals who can provide necessary assistance within a web-based community. Therefore, internet users become organized into self-help groups. Available evidence demonstrates that web-based interactions between peers have enormous potential to help bridge the gap between the identified need for services and the limited resources available for conventional treatment [27].

A peer is defined as a person who has the same social position or abilities as other members of a group [28]. There are several types of peer relationships, such as (1) between a peer and another individual (dyad), (2) between a peer and a group, and (3) a hybrid of both types [29,30]. Furthermore, the types of peer-to-peer interactions are heterogeneous and may include mutual support or participation in consumer assistance or peer-run programs [25,31]. Some of these can occur web-based via different platforms available, such as support groups, forums, discussion groups, bulletin boards, social media, and chats [32].

Peer-to-peer interactions allow people to share experiences, exchange information, and provide advice and emotional support in a natural and spontaneous manner. Therefore, they constitute an exciting subject of research. There is evidence showing that relationships between peers promote behavioral changes [33], improve coping strategies [34], and alleviate social isolation and loneliness among people with mental disorders [35-37]. For many people, social networking on the internet is the major form of communication that facilitates social interactions [38]. This is especially true for individuals who experience difficulties in direct contact with others because of stigmatization [39]. Barak et al [40] reported lower levels of emotional distress among adolescents when they were involved in a web-based forum. However, peer-to-peer interactions on the internet may also negatively affect mental health. Generally, internet use raises concerns, such as user behavior control, accurate risk assessment, privacy, and confidentiality [41].

Currently, new technologies are being developed for people with mental disorders, including artificial intelligence (AI) that already plays a major role in general medicine and research [42-44]. Techniques based on AI are widely applied in medical imaging diagnostics [45-47], but they can also be used for personalization purposes [48-50]. By identifying patterns in the types of interactions linked to specific types of disorders, these techniques could help individualize interventions provided by moderators of web-based forums. AI might also serve as a supporting tool in situations where there are no forum administrators (eg, owing to high costs). It can tailor the content to individual needs and concerns of the users.

Objectives

So far, studies assessing peer-to-peer interactions, including systematic reviews [51-53], have focused on the efficacy of such interactions. However, studies that summarize qualitative research are lacking. To fill this gap, we conducted a scoping review that addressed the following research questions:

1. What are the needs that individuals with mental disorders fulfill through web-based peer-to-peer interactions?
2. What are the categories of peer-to-peer interactions and how can they be used in further research?
3. Is it possible to use machine learning (ML) techniques to assess and classify mental disorders based on the types of peer-to-peer interactions?

In our opinion, heterogeneous and multidimensional data can be best handled using ML techniques (or even deep learning if
Methods

The study was conducted in accordance with the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews; Multimedia Appendix 1 [54,55]). The study protocol was registered in the Open Science Framework (added on August 24, 2020, and registered on November 11, 2020 [56]).

Eligibility Criteria

For this analysis, we considered studies performed according to qualitative or mixed (ie, qualitative and quantitative) methodology that evaluated the following: (1) web-based interactions between participants with any mental disorder that is defined according to any standard diagnostic criteria and (2) interactions between a peer and another individual (dyad) [57]. Studies that assessed only family members or caregivers of people with mental disorders were excluded. No language or date restrictions were applied. In addition, the eligibility criteria were not limited to a specific location, publication status, or any other characteristic.

Search Strategy

We searched 4 electronic databases (Ovid MEDLINE, Embase, Cochrane Library, and Web of Science) until August 15, 2022. The search was performed without any restrictions on the language or publication date of the studies. All search strategies are available in Multimedia Appendix 2. For additional papers, we manually searched the references of reviews that were obtained through the search.

Study Selection

To identify eligible studies, titles, abstracts, and full texts were individually assessed by any 2 of the 5 reviewers (DS, PJ, MJS, MG, and APD). Conflicts were resolved by discussion or involvement of a third reviewer (DS or MMB).

Data Charting

Data charting was performed independently by 2 of the 5 authors (DS, PJ, MJS, ZS, and EA). Disagreements were resolved by consensus or arbitration by a third reviewer (DS). All relevant data on research characteristics (eg, study design, country of origin, and funder), methodology (eg, type of coding and coding scheme), participants (eg, age, gender, and type of mental disorder), and results (interactions) were extracted since November 8, 2020.

Credibility Assessment

The study quality was assessed by 2 of the 4 independent reviewers (MJS, EA, ZS, and PJ) using the Critical Appraisal Skills Programme (CASP) checklist for qualitative research [58]. The tool included 10 questions about study validity, study results, and whether the results helped locally. They could be answered by selecting yes, no, or can’t tell. We divided the final question (How valuable is the research?) into 3 subquestions according to the hints provided in the manual: (1) input into existing knowledge (10a); (2) identification of unexplored areas (10b); and (3) external validity of the findings (10c). These 3 criteria were scored as 0 (not fully met) or 1 (fully met). The general assessment of the study quality was based on the sum of the scores from the 3 subquestions. A score of 3 indicated a valuable study; 2, a moderately valuable study; 1, a study of some quality; and 0, a study of no quality. Any disagreements were resolved by the involvement of a third independent reviewer (DS).

Synthesis of Results

The essential data on the population and methodology of the included studies were summarized in tabular and descriptive forms. All types of interactions observed in the studies were grouped into several categories (codes), which were defined based on the previous literature. To describe the categories and the links between them, several models were used (both originally developed and derived from the literature). The models were created during the discussion between the coauthors (DS, PJ, and APD), and they were presented as partition trees (Multimedia Appendix 3). The models were evaluated based on the lowest SD value of the number of codes in the category, which was the most common measure of the dispersion of results [59]. The frequency of codes as well as the co-occurrence of codes and diseases were presented using heatmaps (means and sums) and a circular chart (co-occurrence frequencies) to investigate possible associations between interactions and specific disorders.

All graphs were prepared using Python 3.7.10 (Python Software Foundation) libraries: Matplotlib 3.2.2 (John Hunter), Seaborn 0.11.1 (Michael Waskom), NetworkX 2.5.1 (Aric Hagberg, Dan Schult and Pieter Swart), Graphviz 2.47.1 (John Ellson), VOSviewer 1.6.6 (Nees Jan van Eck and Ludo Waltman), or Microsoft Office 2004 (Microsoft Corp). The source code is available on GitHub.

Statistical Analysis

We used the ϕ coefficient [60] to examine the associations between the types of interactions and mental disorders. Using Pandas 1.1.5 (Wes McKinney) and NumPy 1.19.5 (Travis Oliphant), we represented the data as a data frame and then used SciPy 1.4.1 (Travis Oliphant, Pearu Peterson, and Eric Jones) to calculate associations and their statistical significance. Associations within the following subgroups were evaluated: (1) type of disorder, (2) studies assessed as valuable versus other studies, and (3) types of disorder using only valuable (high-quality) studies. ML techniques were applied to classify mental disorders based on interactions between users. For this purpose, several basic algorithms were used. These algorithms were selected based on their strong mathematical background and resultant explainability properties, as we were interested in identifying the variables that contributed to performance [61]. More specifically, we incorporated decision trees (with minimum samples per leaf ranging from 1 to 3), logistic regression (with L2 regularization), support vector machines (with the radial basis function kernel), k-nearest neighbors algorithm (with k ranging from 2 to 5), and Gaussian naïve
Bayes classifier (default settings). For this analysis, Scikit-learn (version 0.22.2) was used.

**Mapping the Terms**
To examine the relations between the terms as well as construct and visualize bibliometric networks, we used the mapping software VOSviewer (version 1.6.16) [62]. We aimed to investigate the co-occurrence networks of important terms extracted from the full text of the included studies. Thus, we provided a visualization. The distance between any pair of objects reflects their similarity as accurately as possible. Objects with high similarity are located close to each other, whereas objects with low similarity are located far from each other. We created a co-occurrence map by applying the default counting method and choosing number 5 as the minimum number of occurrences considering the most advantageous setting in terms of resources, time, and data received [62]. A total of 2 independent reviewers (DS and PJ) screened the list of terms extracted from VOSviewer and selected those that described the interactions. Any discrepancies were resolved through discussion. The final terms were used to create visualizations. In addition, we compared the terms selected from VOSviewer with the codes from our codebook and calculated the percentage of overlap.

**Results**

**Overview**
The search identified 13,098 original references, and the screening of titles and abstracts yielded 86 full-text papers. A total of 44 studies were included in the final analysis and 8 were labeled as ongoing (Multimedia Appendix 4 [63-105] and Multimedia Appendix 5 [104-111]). The study flow is presented as a PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram in Figure 1 [112]. A list of excluded studies with the reason for exclusion is provided in Multimedia Appendix 6 [113-146].

**Figure 1. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram.**
Included Studies

The detailed characteristics of the 44 included studies (analyzed in 54 study-disorder pairs) are presented in Table 1 and Multimedia Appendix 7 [63-105]. These studies were conducted between the years 2000 and 2022. Among the corresponding authors, 82% (36/44) originated from English-speaking countries, including the United States (16/44, 36%), the United Kingdom (9/44, 20%), Canada (6/44, 14%), Australia (2/44, 5%), Ireland (1/44, 2%), Singapore (1/44, 2%), and Hong Kong (1/44, 2%); whereas 18% (8/44) originated from non–English-speaking countries, including Sweden (3/44, 7%), Israel (2/44, 5%), Switzerland (1/44, 2%), Italy (1/44, 2%), and Hungary (1/44, 2%). None of the included studies provided information on whether the study protocol was registered in an appropriate registry.

Table 1. Characteristics of the included studies (N=44).

| Variable                                      | Value, n (%)a |
|-----------------------------------------------|---------------|
| **Place of interaction**                      |               |
| Forum                                         | 26 (59)       |
| Media (Facebook, Instagram, etc)              | 12 (27)       |
| Support group                                 | 7 (16)        |
| Blog                                          | 1 (2)         |
| Chat                                          | 1 (2)         |
| **Access to the place of interaction**        |               |
| Public access                                 | 25 (57)       |
| Registration                                  | 4 (9)         |
| Partial access (need to register to add comments) | 6 (14)   |
| Not reported                                  | 10 (23)       |
| **Type of analysis used**                     |               |
| Content analysis                              | 23 (52)       |
| Thematic analysis                             | 13 (30)       |
| Discourse analysis                            | 5 (11)        |
| Constant comparison                           | 2 (5)         |
| Conversational analysis                       | 2 (5)         |
| Other                                         | 13 (30)       |
| Not reported                                  | 1 (2)         |
| **Coding schemes for social support and interaction** |         |
| Cutrona and Suhr                              | 5 (11)        |
| The self-reported coding scheme               | 3 (7)         |
| Other                                         | 7 (16)        |
| Not reported                                  | 33 (75)       |

aSome studies could be included in >1 subgroup.

Participants

The studies included 82,091 users (mean 3284, SD 9526; range 11-41,967) who posted 293,106 comments (mean 8374, SD 25,105; range 4-132,599) on 19,940 topics (mean 1173, SD 2916; range 5-10,169). The age of the participants ranged from 16 to 78 years, although most studies (37/44, 84%) did not report data on age. The proportion of women ranged from 0% to 100% (mean 65%, SD 34%); however, most studies (31/44, 70%) did not provide this information. The percentage of inactive to passive forum users was 47.62% (range 17%-85.47%). In 18% (8/44) of studies, participants were recruited to register on a forum created by the authors themselves. There were 22 different mental disorders classified into 13 categories. Most commonly, studies have assessed peer-to-peer interactions among individuals with eating disorders (14/54, 26%), depression (12/54, 22%), and psychoactive substance use disorders (9/54, 17%). Next, there were the following disorders: postpartum depression (4/54, 7%), anxiety disorders (3/54, 6%), posttraumatic stress disorder (2/54, 4%). The remain disorders occurred only once (1/54, 2%): attention-deficit/hyperactivity disorder, bipolar affective disorder, mild cognitive impairment, obsessive compulsive disorder, schizoaffective disorder, and schizophrenia.
Type of Platform for Interaction

Of the 44 platforms, 11 (25%) platforms were developed specifically for the mental health setting, 3 (7%) platforms were intended for more general health, and for 30 (68%) platforms, this information was not reported. Most studies assessed web-based forum interactions (26/44, 59%). In most cases, access to the place of interaction was free and registration was not required to add comments (25/44, 57%). However, in some cases, registration was required to add and read comments (4/44, 9%). However, in some other cases, forums offered partially free access, with registration required to add, but not read, comments (6/44, 14%).

Most studies reported the presence of moderators (22/44, 50%). Their roles included the following: (1) provision of advice or therapy, (2) monitoring and control of content (sensitive, legal, sexual, abuse, and eliminate spam), or (3) moderation of discussions.

Anonymity was ensured in most of the studies (35/44, 80%). The authors paraphrased participants’ statements and comments, did not record any personal data, excluded nicknames from the analysis, replaced nicknames with initials, or did not include quotations in the text. Membership terms of use were specified in 36% (16/44) of studies. For example, by accepting the terms and conditions, users agreed to treat other members with respect, provide support, avoid profanity and unhelpful language, avoid detailed and vivid descriptions of self-harming techniques, not offer drugs to other members, and provide links to sites selling drugs.

Methods in the Included Studies

Of the 44 studies, 17 (39%) studies used only qualitative methodology, whereas 19 (43%) studies also used a frequency analysis. Mixed methods (ie, qualitative and quantitative) were applied in 18% (8/44) of studies.

Content and thematic analyses were the most common (23/44, 52% and 13/44, 30%, respectively). Other analyses included membership categorization, ethnomethodological, netnographic, rhetorical, framework, interpretative phenomenological, image, sequence, paths, and social networks, each applied in a single study.

A low level of precision regarding reporting on methodological approaches impeded comparisons of the analytic strategies used by the authors. Coding performed by 2 people was reported in 52% (23/44) of studies. In 27% (12/44) of studies, complete coding was performed independently, in 16% (7/44) of studies, it was performed only during the calibration process, and in 9% (4/44) of studies, one author coded part of the material and the other author checked that coding. Coding was applied inductively in 43% (19/44) of studies and deductively in 14% (6/44) of studies. In 11% (5/44) of studies, both approaches were used, and the remaining 32% (14/44) of studies did not report the coding strategy. A codebook was developed openly (without blinding) in 18% (8/44) of studies. Blinding was established in 2% (1/44) of papers. The coding scheme for social support designed by Cutrona and Suhr [147] was used in 11% (5/44) of studies, whereas 16% (7/44) of studies adopted different approaches proposed by Cohen and Wills [148], Oakley [149], Tong et al [150], Bauer et al [151], Morse and Field [152], Gayssinsky et al [153], and Bales [57]. In 7% (3/44) of studies, the authors used their own system [63,154,155].

To determine interrater agreement, Cohen κ was used in 14% (6/44) of studies, Krippendorff α was used in 2% (1/44), and data were not reported in the remaining 84% (37/44) of papers. In 4 studies, the diagnosis of participants was confirmed using the Center for Epidemiologic Studies Depression Scale or by a specialist.

Types of Interactions

We distinguished 42 codes that described peer-to-peer interactions. The codes were organized into 15 categories from A to O (Table 2), and we proposed 14 different models of coding interventions among peers (Multimedia Appendix 3). Six models were based on existing models: 1 [147], 3 [156], 4 [153], 5 (adapted from Liu et al [157]), 6 [158], and 7 [57]. A total of 2 models were modified based on the models by Cutrona and Suhr [147] (model 2) and Greiner et al [64] (model 8). The remaining 6 models were developed by us (models 9, 10, 11, 12, 13, and 14). After calculating the means and SDs, the models were ranked based on the lowest SD (Multimedia Appendix 8). Model 14 was characterized by the lowest SD (9.32), and the corresponding tree is presented in Figure 2.

The most frequent interactions were empathy or compassion (41/54, 76%), network (40/54, 74%), and sharing self-disclosure (39/54, 72%). Heatmaps of the selected codes and disorders and their co-occurrence are presented in Figure 3 and Multimedia Appendices 9 and 10. We visualized the normalized means of code co-occurrence across disorders and all included studies. However, heatmaps should be interpreted with caution because of the unequal number of papers regarding individual disorders, which resulted in certain codes being used significantly more often.

The co-occurrence of all codes is shown in Figure 4. Co-occurrence was observed most often for request for information and network (35 times). There was a positive association between these 2 codes (φ=0.5; P<.001). The strongest positive association was noted between requesting engagement and disagreement, relationship and confidentiality, and referring to the rules and rejection (φ=0.65; P<.001). As for correlations between codes and disorders, the strongest correlation was observed between attention-deficit/hyperactivity disorder and illegal advice (φ=0.70; P<.001). The remaining associations for the overall and subgroup analyses are presented in Multimedia Appendix 10.

We achieved the highest accuracy in classifying disorders by interactions using 2 methods: decision trees (44/54, 81%) and logistic regression (40/54, 74%). The confusion matrices (with absolute values and relative percentages) of the ML techniques with detailed results are presented in Multimedia Appendix 11. In addition, using decision trees, we visualized the possible pathways to identify mental disorders (Multimedia Appendix 12).
| Node | Codes | Meaning |
|------|-------|---------|
| A1   | Referral | • Referring the recipient to other sources of information or help, other places in general, and nonprofessional  
|      |        | • Providing the recipient with access to new people or other communication channels |
| A2   | Request for opinions or suggestions | • Asking about any act that offers direction or action for how to engage in the task or advances a belief or the value that is relevant to the task |
| A3   | Situation appraisal | • Helping reassess or redefine the situation faced by the recipient |
| B1   | Positive | • Showing positive emotions |
| B2   | Negative | • Showing negative emotions |
| C1   | Sharing self-disclosure | • Speaking about oneself, one’s experience, and one’s disease (recovery reports, treatment, diagnosis, etc) |
| D1   | Sarcastic comments | • Being disrespectful, insolent toward other members or statements that express being hurt |
| D2   | Aggression | • Presenting hostile or violent attitudes toward another with or without readiness to attack or confront |
| D3   | Disagreement | • Expressing a different opinion |
| D4   | Rejection | • Expressing little desire to include a person in their groups and relationships or excluding a person |
| D5   | Reluctance or aversion | • Expressing a strong dislike or disinclination |
| E1   | Encouragement or motivation | • Providing the recipient with a motive for doing something and confidence |
| E2   | Compliment | • Improving one’s self-worth by saying positive things about the recipient |
| F1   | Practical tricks | • Sharing advice (not necessarily based on facts and can be based on self-experience)  
|      |        | • Providing ideas or suggestions for action |
| F2   | Instrumental | • Offering help or a talk |
| F3   | Tangible | • Sharing goods or services |
| G1   | Appreciation or gratitude | • Expressing appreciation to another individual from the group or the group all in all |
| H1   | Requesting engagement | • Asking for opportunity to participate or be involved in group’s life |
| H2   | Request for other kinds of support | • Asking about anything other than facts, opinions, or suggestions |
| H3   | Small talks or socializing | • Greetings  
|      |        | • Taking politely about unimportant or uncontentious matters |
| H4   | Encouraging disclosure | • Motivating to expose oneself, revealing information about oneself |
| I1   | Informational | • Sharing information or theoretical knowledge (should be based on facts) |
| I2   | Referring to the rules | • Mentioning and enforcing the applicable group norms and rules |
| I3   | Illegal advice | • Mostly related to drugs—providing information about where one can buy drugs and how to deal with getting a prescription from a physician |
| I4   | Warnings | • Indicating a possible danger, problem, or other unpleasant situation |
| J1   | Request for information | • Asking questions to obtain an answer about facts |
### Table 1: Peer-to-Peer Interactions and Their Meanings

| Node | Codes | Meaning |
|------|-------|---------|
| J2   | Clarifications | - Asking to make a statement or situation less confusing and more comprehensible (eg, asking for explanation or asking additional questions) |
| J3   | Verifying the authenticity | - Asking about proofs (eg, a code of diagnosis) |
| K1   | Related to professional help | - Providing information about places where one can obtain help from specialists |
| K2   | Related to medication | - Providing information about drugs, doses, and route of administration |
| K3   | Related to side effects | - Providing information about an unpleasant effect of a drug that occurs in addition to the main effect |
| L1   | Presence or companions | - Offering to be there |
| L2   | Offering hope | - Providing the recipient with hope |
| L3   | Spiritual | - Offering prayer for the recipient |
| L4   | Tension Release or jokes | - Posting messages that include humor  
- Reducing the anxiety that a person or a group may be experiencing |
| M1   | Empathy or compassion | - Showing that their feelings are seen |
| N1   | Apologizing | - Expressing regret for doing something wrong |
| N2   | Confidentiality | - Keeping the recipient’s problem in confidence |
| N3   | Behavior promotion | - Supportive of harmful behavior  
- Supportive of minimizing harmful behavior  
- Unsupportive of harmful behavior |
| N4   | Acceptance | - Being received and admitted into a group |
| N5   | Relationship | - Conveying the importance of closeness |
| O1   | Network | - Providing agreement with the views of the recipient  
- Providing validation, normalizing the situation  
- Showing the problem or situation as affecting more people, helping in identification, solidarity, and group cohesion  
- Alleviating any feelings of guilt that the recipient may have about the situation |

**Figure 2.** Categorization of peer-to-peer interactions.
Figure 3. Heatmap with normalized means of code co-occurrence among mental disorders. ADHD: attention-deficit/hyperactivity disorder; AXD: anxiety disorders; BD: bipolar affective disorder; DEP: depression; ED: eating disorders; MCI: mild cognitive impairment; OCD: obsessive compulsive disorder; PPD: postpartum depression; PSU: psychoactive substance use; PTSD: posttraumatic stress disorder; SCZ: schizophrenia; SZA: schizoaffective disorder.
Figure 4. Circular chart of the co-occurrence of codes. The nodes represent specific types of interaction (Table 2). Node size corresponds to the number of primary studies that mention this type of interaction, and their size is proportional to the number of co-occurrences. A1: referral; A2: request for opinions or suggestions; A3: situation appraisal; B1: positive; B2: negative; C1: sharing self-disclosure; D1: sarcastic comments; D2: aggression; D3: disagreement; D4: rejection; D5: reluctance or aversion; E1: encouragement or motivation; E2: compliment; F1: practical tricks; F2: instrumental; F3: tangible; G1: appreciation or gratitude; H1: requesting engagement; H2: request for other kinds of support; H3: small talks or socializing; H4: encouraging disclosure; I1: informational; I2: referring to the rules; I3: illegal advice; I4: warnings; J1: request for information; J2: clarifications; J3: verifying the authenticity; K1: related to professional help; K2: related to medication; K3: related to side effects; L1: presence or companions; L2: offering hope; L3: spiritual; L4: tension release or jokes; M1: empathy or compassion; N1: apologizing; N2: confidentiality; N3: behavior promotion; N4: acceptance; N5: relationship; O1: network.

Quality of the Included Studies
A detailed credibility assessment of the individual studies is presented in the Multimedia Appendix 13 [63-105]. An overview of reviewer judgments for each CASP item across all the studies is presented in Figure 5. Of the 44 studies, 13 (30%) studies were assessed as valuable; 24 (55%), as moderately valuable; and 7 (16%), as being of some value. All (44/44, 100%) the studies assessed in this review used an appropriate qualitative methodology and discussed the contribution of the included studies to existing knowledge. The weakest domain included discussing the applicability of the results to other populations or considering other uses for research (16/44, 36%). The mean quality score was 2.14 (SD 0.67), which corresponded to moderately valuable or valuable studies.
Mapping the Terms

Of the 2068 terms extracted from full-text articles (collected in 18 clusters; Figure 6A), we selected 345 (occurring 11,039 times in included papers) to create a term co-occurrence map (Figure 6B). It produced 15 clusters, which are listed in Multimedia Appendix 14, along with a list of terms. The most frequent terms related to peer-to-peer interactions were support (629/11,039, 5.69%), information (576/11,039, 5.22%), and experience (372/11,039, 3.37%). The overlap of terms describing interactions identified using VOSviewer with codes from our codebook was 96.3% (180/187). Some (7/187, 3.7%) categories did not have an equivalent in the code (avoidance, blame, competition, discrimination, shame, tolerance, and trust).

Discussion

Principal Findings

This systematic scoping review summarizes 44 studies that assessed peer-to-peer interactions among people with 22 different mental disorders. The interactions were categorized into 13 groups. The most common interactions such as empathy or compassion, networking, and sharing self-disclosure were observed on forums for people with eating disorders (14/54, 26%), depression (12/54, 22%), and psychoactive substance use (9/54, 17%). In this study, we focused on developing a codebook for future research. We believed that the reinterpretation of the data reported by the authors of the primary studies included in our review may have introduced bias. Therefore, we did not deliberately dwell on the coexistence of codes and specific disorders. For example, it seemed that sarcastic comments were present in most studies on schizophrenia and schizoaffective disorders. We could hypothesize that because of their condition, these people may be survivors of verbal aggression from their peers. However, it is possible that people with schizophrenia and schizoaffective disorders post sarcastic comments. Thus, this conclusion cannot be fully justified without looking into the primary data, but such an analysis was not the objective of this study. Nevertheless, the normalized means of code co-occurrence across disorders presented in Figure 3 are a good starting point to formulate hypotheses for our future primary studies.

Our study revealed the needs that prompt users to express themselves on the internet. For example, these may be information, emotional, or instrumental support needs. However, without primary research, it is difficult to determine whether these needs are fully (if at all) satisfied by internet use. We can
assume that the unmet need is fulfilled by another internet user; however, these interactions will be the subject of future research. We are aware that because a systematic scoping review aims to map and identify gaps in current knowledge, we will generate more questions than answers. Nevertheless, we hope that this study will inspire future qualitative research in the field.

**Overall Completeness and Quality of Evidence**

Our study provides evidence on the involvement of people with different mental disorders in online support groups. However, these disorders did not include personality disorders, organic mental disorders, or phobias, and there were no data on the experience of these individuals in seeking support on the internet. In addition, from the analysis of various interaction models, we noticed that some of the codes were not represented in our results because they might not have been assessed or the authors might have failed to report them (eg, owing to insufficient sample size). Therefore, we could not generalize the results to other populations because they may not fully reflect reality. As for the applied qualitative methodology, the authors used different approaches and analytical models. Owing to the diversity of theoretical perspectives, epistemological assumptions, and principles of conducting research, it can be challenging to apply a qualitative approach, including the comparison and synthesis of methods used in qualitative research [159]. Some authors did not comply with the available reporting guidelines [160-162]. Therefore, many studies lacked information on methodology, population characteristics, and outcomes.

Considering the level of adherence to the methodology and the applied methods themselves, we assessed the overall quality of the studies included in our analysis as moderate.

**Codes and Correlations**

We coded 42 types of interactions between the forum participants. We hierarchized the codes into a model consisting of 15 categories. Our model differs in structure compared with other models in the literature. Although merging some codes into one category may seem unintuitive at first, it resulted from a modified combination of different theoretical approaches and multidisciplinary backgrounds of authors (psychiatry, psychology, sociology, epidemiology, and public health). For example, even though proanorexia forums supported harmful behaviors and contained reinforcers for further weight loss or praise for achieving lower weight, we decided to include the supportive of harmful behaviors category in the behavior promotion category. A membership in a social group or a web-based community affects the beliefs, preferences, and behaviors of the members via various mechanisms of social influence [163]. Therefore, the category of behavior promotion embraces all acts that reinforce behavior patterns regardless of their health consequences.

Assessing the co-occurrence of interactions, we found that the request for information most commonly co-occurred with network, which stems from the reciprocal nature of conversation that involves the exchange of questions and replies. The strongest associations were found for requesting engagement and disagreement, relationship and confidentiality, and referring to the rules and rejection. This may be explained by group processes that occur when new members join the group and are mobilized to share their story; the members are assured of confidentiality and presented with the rules that, for example, if violated, will result in the member being removed from the group [164].

A comparison of our codes with the terms identified in VOSviewer showed that our codebook may lack some interactions. However, these extra terms might have occurred in the background or discussion sections and do not apply to our study. Thus, VOSviewer clusters should always be interpreted together with content analysis.

Overall, our study showed that it is possible to use ML techniques to classify mental disorders based on secondary data. Although the results may seem satisfactory, as the accuracy for decision trees was >80%, we cannot consider them to be more than just a proof of concept because of several limitations.

**Our Results in the Context of Previous Research**

To our knowledge, this is the first scoping review that comprehensively summarizes evidence on all types of web-based peer-to-peer interactions among people with mental disorders. Previous reviews addressed only some types of peer interactions in the context of various nonpsychiatric health-related conditions, such as spinal cord injury [165,166], breastfeeding of hospitalized infants [167], or cancer [168]. In secondary research, peer-to-peer interactions are mostly assessed quantitatively (eg, efficacy assessment [51-53]).

Our study was not limited to specific mental health problems. This is in contrast to previous reviews on mental conditions, as they mainly addressed suicide prevention and dementia. Bowersox et al [169] conducted a scoping review on the function of peers in the prevention of suicidal behaviors. The authors concluded that peer-based interventions could play an important role in suicide prevention. Schlichthorst et al [170] studied peer support programs in suicide prevention and emphasized the usefulness of internet forums as support for people with a history of suicide attempt. Moreover, they alerted to the risks of unmoderated websites.

Carter et al [171] and Newman et al [172] also reviewed web-based peer support interventions in the context of a specific mental health problem (ie, dementia). However, unlike our study, they did not focus on people who directly experienced these problems but assessed individuals who cared for people with dementia. In addition, they did not assess the quality of the included studies. Similar to our approach, they searched several databases and applied similar guidelines for reporting scoping studies [173]. However, they attempted to answer different questions about the effectiveness of interventions and their cost-effectiveness, in addition to identifying the gaps in knowledge.

**Limitations**

Our study has several limitations. First, we believe that the use of ML techniques requires more data than those collected in this study. Nevertheless, we consider this analysis to be a proof of concept only. Second, the CASP tool was adapted to our
needs by dividing the last question into 3 subquestions. This makes it more challenging to compare the quality of the included studies with that of similar studies. Moreover, with a small data set available, we used the same data for training and calculating the accuracy of ML algorithms (without external validation), which limits the reliability of the results.

**Strengths**

The strengths of our study include the use of a broad question followed by comprehensive and rigorous search of eligible studies. We searched 4 databases and followed the reporting process provided by Tricco et al [54,55]. In addition, we also assessed the quality of all included studies. We proposed a codebook and partition tree based on the dispersion of the results and compared it with other models. This innovation helps standardize the evidence and allows for data comparison across studies. Finally, we applied ML techniques to identify mental disorders using interactions among peers. The results are quite satisfactory, and even though they are a proof of concept, they can be further explored in future studies.

**Future Research**

We believe that our codebook describing the categories of peer-to-peer interactions defined in this study can be used in future in-depth investigations of individual mental disorders. In addition, by using AI techniques and applying the rigorous validation of accuracy, this type of analysis could be used to facilitate the diagnosis or screening of mental disorders within web-based self-help groups. Moreover, the assessment of the co-occurrence of interactions and types of disorders could help identify adequate skills and communication styles to define the moderator’s characteristics to meet the requirements of a particular forum. However, as this is a proof-of-concept investigation, more specific data are needed to achieve these goals. As only a few studies have investigated web-based peer-to-peer interactions in the setting of mental disorders, more primary research is needed to obtain more evidence. It would be helpful to develop an ML model to establish which interactions are associated with specific diseases and to use AI techniques to investigate more interactions. This could translate into creating a personalized health care experience for individuals with mental disorders.

**Conclusions**

Internet forums offering peer-to-peer support in mental health attract a heterogeneous group of people. Interactions between the members are predominately positive. Although the use of the internet to seek support for health problems has become commonplace, scientific evidence on this phenomenon is scarce. In the future, AI-based analysis of interactions between the members of mental health forums and a better understanding of their needs could help moderators provide personalized support to internet users.

**Data Availability**

The code is available on GitHub [174]. The data supporting the findings of this study are available in Multimedia Appendices 1-14.

**Conflicts of Interest**

None declared.

**Multimedia Appendix 1**

PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) checklist.

[DOCX File, 33 KB-Multimedia Appendix 1]

**Multimedia Appendix 2**

Search strategies.

[DOCX File, 31 KB-Multimedia Appendix 2]

**Multimedia Appendix 3**

Other partition trees.

[DOCX File, 73 KB-Multimedia Appendix 3]

**Multimedia Appendix 4**

List of included studies.

[DOCX File, 33 KB-Multimedia Appendix 4]

**Multimedia Appendix 5**

List of ongoing studies.

[DOCX File, 28 KB-Multimedia Appendix 5]
Multimedia Appendix 6
List of excluded studies according to the reason for exclusion.
[DOCX File, 33 KB-Multimedia Appendix 6]

Multimedia Appendix 7
Characteristics of included studies.
[DOCX File, 46 KB-Multimedia Appendix 7]

Multimedia Appendix 8
Means of codes per category and SDs for analyzed models.
[DOCX File, 29 KB-Multimedia Appendix 8]

Multimedia Appendix 9
Heatmaps with codes.
[DOCX File, 146 KB-Multimedia Appendix 9]

Multimedia Appendix 10
Supplementary material.
[XLSX File (Microsoft Excel File), 95 KB-Multimedia Appendix 10]

Multimedia Appendix 11
Machine-learning results with confusion matrices.
[DOCX File, 612 KB-Multimedia Appendix 11]

Multimedia Appendix 12
Decision trees of prediction of diseases based on the presence of interaction.
[DOCX File, 391 KB-Multimedia Appendix 12]

Multimedia Appendix 13
Quality of included studies.
[DOCX File, 103 KB-Multimedia Appendix 13]

Multimedia Appendix 14
List of clusters and related terms from VOSviewer.
[DOCX File, 41 KB-Multimedia Appendix 14]

References
1. Wittchen HU, Jacobi F, Rehm J, Gustavsson A, Svensson M, Jönsson B, et al. The size and burden of mental disorders and other disorders of the brain in Europe 2010. Eur Neuropsychopharmacol 2011 Sep;21(9):655-679. [doi: 10.1016/j.euroneuro.2011.07.018] [Medline: 21896369]
2. Kessler RC, Chiu WT, Demler O, Merikangas KR, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. Arch Gen Psychiatry 2005 Jun;62(6):617-627 [FREE Full text] [doi: 10.1001/archpsyc.62.6.617] [Medline: 15939839]
3. Angermeyer MC, Matschinger H. Public beliefs about schizophrenia and depression: similarities and differences. Soc Psychiatry Psychiatr Epidemiol 2003 Sep 1;38(9):526-534. [doi: 10.1007/s00127-003-0676-6] [Medline: 14504738]
4. Smith M. Anti-stigma campaigns: time to change. Br J Psychiatry Suppl 2013 Apr 02;55(s55):s49-s50. [doi: 10.1192/bjp.bp.113.126813] [Medline: 23553694]
5. Angermeyer MC, Schulze B. Reinforcing stereotypes: how the focus on forensic cases in news reporting may influence public attitudes towards the mentally ill. Int J Law Psychiatry 2001 Jul;24(4-5):469-486. [doi: 10.1016/s0160-2527(01)00079-6]
6. Becker AE, Kleinman A. Mental health and the global agenda. N Engl J Med 2013 Jul 04;369(1):66-73. [doi: 10.1056/nejmra1110827]
7. Loch AA, Wang Y, Guarniero FB, Lawson FL, Hengartner MP, Rössler W, et al. Patterns of stigma toward schizophrenia among the general population: a latent profile analysis. Int J Soc Psychiatry 2014 Sep 21;60(6):595-605. [doi: 10.1177/0020764013507248] [Medline: 24146365]

8. Kessler RC, Foster CL, Saunders WB, Stang PE. Social consequences of psychiatric disorders, I: educational attainment. Am J Psychiatry 1995 Jul;152(7):1026-1032. [doi: 10.1176/ajp.152.7.1026] [Medline: 7793438]

9. Gowen K, Deschaine M, Gruttadara D, Markey D. Young adults with mental health conditions and social networking sites: seeking tools to build community. Psychiatr Rehabil J 2012;35(3):245-250. [doi: 10.2975/35.3.2012.245.250] [Medline: 22246123]

10. Dickerson SS, Boehmke M, Ogle C, Brown JK. Seeking and managing hope: patients’ experiences using the Internet for cancer care. Oncol Nurs Forum 2006 Jan;31(1):E8-17. [doi: 10.1188/06.ONF.E8-17] [Medline: 16470231]

11. van Uden-Kraan CF, Drossaert CH, Taal E, Seydel ER, van de Laar MA. Self-reported differences in empowerment between lurkers and posters in online patient support groups. J Med Internet Res 2008 Jun 30;10(2):e18 [FREE Full text] [doi: 10.2196/jmir.992] [Medline: 18653442]

12. White M, Dorman S. Receiving social support online: implications for health education. Health Educ Res 2001 Dec;16(6):693-707. [doi: 10.1093/her/16.6.693] [Medline: 11780708]

13. Murray CD, Fox J. Do Internet self-harm discussion groups alleviate or exacerbate self-harming behaviour? Aust e-J Advance Mental Health 2014 Dec 17;5(3):225-233. [doi: 10.5172/jamh.5.3.225]

14. Carrard I, Rouget P, Fernández-Aranda F, Volkart A, Damoiseau M, Lam T. Evaluation and deployment of evidence based patient self-management support program for Bulimia Nervosa. J Int Med Inform 2006 Jan;75(1):101-109. [doi: 10.1016/j.jiimedinf.2005.07.031] [Medline: 16115793]

15. Johnsen JK, Rosenvinge JH, Gammon D. Online group interaction and mental health: an analysis of three online discussion forums. Scand J Psychol 2002 Dec 28;43(5):445-449. [doi: 10.1111/1467-9450.00313] [Medline: 12500784]

16. Spinzy Y, Nitzan U, Becker G, Bloch Y, Fennig S. Does the Internet offer social opportunities for individuals with schizophrenia? A cross-sectional pilot study. Psychiatry Res 2012 Jul 30;198(2):319-320. [doi: 10.1016/j.psychres.2012.02.022] [Medline: 22440545]

17. Expanding telemental health in response to the COVID-19 pandemic. Psychiatric Times. 2020 Apr 08. URL: https://www.psychiatrictimes.com/view/expanding-telemental-health-response-covid-19-pandemic [accessed 2022-05-13]

18. Measuring Digital Development Facts and Figures 2021. Geneva: International Telecommunication Union; 2021.

19. van Uden-Kraan CF, Drossaert CH, Taal E, Seydel ER, van de Laar MA. Self-reported differences in empowerment between lurkers and posters in online patient support groups. J Med Internet Res 2008 Jun 30;10(2):e18 [FREE Full text] [doi: 10.2196/jmir.992] [Medline: 18653442]

20. Mo PK, Coulson NS. Empowering processes in online support groups among people living with HIV/AIDS: a comparative analysis of ‘lurkers’ and ‘posters’. Comput Human Behav 2010 Sep;26(5):1183-1193. [doi: 10.1016/j.chb.2010.03.028]

21. Chung JE. Social networking in online support groups for health: how online social networking benefits patients. J Health Commun 2014;19(6):639-659. [doi: 10.1080/10810730.2012.757396] [Medline: 23557148]

22. Schrank B, Sibitz I, Unger A, Amering M. How patients with schizophrenia use the internet: qualitative study. J Med Internet Res 2010 Dec 19;12(5):e70 [FREE Full text] [doi: 10.2196/jmir.1550] [Medline: 21169176]

23. Kang R, Brown S, Kiesler S. Why do people seek anonymity on the internet?: informing policy and design. In: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. 2013 Presented at: CHI ’13: CHI Conference on Human Factors in Computing Systems; Apr 27-May 2, 2013; Paris France. [doi: 10.1145/2470654.2481368]

24. McKenna KY, Bargh JA. Coming out in the age of the internet: identity “demarginalization” through virtual group participation. J Personal Social Psychol 1998 Sep;75(3):681-694. [doi: 10.1037/0022-3514.75.3.681]

25. Davidson L, Chinman M, Kloos B, Weingarten R, Stayner D, Tebes JK. Peer support among individuals with severe mental illness: a review of the evidence. Clin Psychol Sci Pract 1999;6(2):165-187. [doi: 10.1093/clipsy.6.2.165]

26. Link BG, Struening EL, Rahav M, Phelan JC, Nuttbrock L. On stigma and its consequences: evidence from a longitudinal part. J Personal Social Psychol 1998 Sep;75(3):681-694. [doi: 10.1037/0022-3514.75.3.681]

27. Lal S, Adair CE. E-mental health: a rapid review of the literature. Psychiatr Serv 2014 Jan 01;65(1):24-32. [doi: 10.1176/appi.ps.20130009] [Medline: 24081188]

28. Explore the Cambridge Dictionary. Cambridge Dictionary. URL: https://dictionary.cambridge.org/usl [accessed 2022-05-13]

29. Moore SE, McMullan M, McEvoy CT, McKinley MC, Woodside JV. The effectiveness of peer-supported interventions for encouraging dietary behaviour change in adults: a systematic review. Public Health Nutr 2018 Dec 03;22(4):624-644. [doi: 10.1017/s1366898018003294]

30. Webel AR, Okonsky J, Trompeta J, Holzemer WL. A systematic review of the effectiveness of peer-based interventions on health-related behaviors in adults. Am J Public Health 2010 Feb;100(2):247-253. [doi: 10.2105/ajph.2008.149419]

31. Davidson L, Chinman M, Sells D, Rowe M. Peer support among adults with serious mental illness: a report from the field. Schizophr Bull 2006 Jul 28;32(3):443-450 [FREE Full text] [doi: 10.1093/schbul/sbj043] [Medline: 16461576]
32. Welch V, Petkovic J, Pardo Pardo J, Rader T, Tugwell P. Interactive social media interventions to promote health equity: an overview of reviews. Health Promot Chronic Dis Prev Can 2016 Apr;36(4):63-75 [FREE Full text] [doi: 10.24095/hpdp.36.4.01] [Medline: 27077792]

33. Burns JM, Durkin LA, Nicholas J. Mental health of young people in the United States: what role can the internet play in reducing stigma and promoting help seeking? J Adolesc Health 2009 Jul;45(1):95-97. [doi: 10.1016/j.jadohealth.2008.12.006] [Medline: 19541256]

34. Tanis M. Health-related on-line forums: what's the big attraction? J Health Commun 2008 Oct 28;13(7):698-714. [doi: 10.1080/1081073080215316] [Medline: 18958781]

35. Galinsky MJ, Schopler JH, Abell MD. Connecting group members through telephone and computer groups. Health Soc Work 1997 Aug 01;22(3):181-188. [doi: 10.1093/hsw/22.3.181] [Medline: 9260082]

36. Nicholas D. Participant perceptions of online group work with fathers of children with Spina Bifida. In: Social Work with Groups. Milton Park, Abingdon-on-Thames, Oxfordshire, England, UK: Routledge; 2003.

37. Weinberg N, Schmale J, Uken J, Wessel K. Online help: cancer patients participate in a computer-mediated support group. Health Soc Work 1996 Feb;21(1):24-29. [doi: 10.1093/hsw/21.1.24] [Medline: 8626154]

38. Internet seen as positive influence on education but negative on morality in emerging and developing nations. Pew Research Center. 2015 Mar 19. URL: https://www.pewresearch.org/global/2015/03/19/internet-seen-as-positive-influence-on-education-but-negative-influence-on-morality-in-emerging-and-developing-nations/ [accessed 2022-02-23]

39. Dickerson FB, Sommerville J, Origoni AE, Ringel NB, Parente F. Outpatients with schizophrenia and bipolar I disorder: do they differ in their cognitive and social functioning? Psychiatry Res 2001 May;102(1):21-27. [doi: 10.1016/s0165-1781(01)00247-5]

40. Barak A, Dolev-Cohen M. Does activity level in online support groups for distressed adolescents determine emotional relief. Counsell Psychother Res 2006 Sep;6(3):186-190. [doi: 10.1080/14733140600848203]

41. Robinson J, Rodrigues M, Fisher S, Bailey E, Herrman H. Social media and suicide prevention: findings from a stakeholder survey. Shanghai Arch Psychiatry 2015 Feb 25;27(1):27-35 [FREE Full text] [doi: 10.11919/j.issn.1002-0829.214133] [Medline: 25852253]

42. Monnier D. Woebot: a continuation of and an end to psychotherapy? Psychotherapies 2020 Apr;40(2):71-78.

43. Velichko E, Nepomnyashchaya E, Baranov M, Galeeva V, Pavlov V, Zavjalov S. A concept of smart medical autonomous distributed system for diagnostics based on machine learning technology. In: Internet of Things, Smart Spaces, and Next Generation Networks and Systems. Cham: Springer; 2019.

44. Halama N. Machine learning for tissue diagnostics in oncology: brave new world. Br J Cancer 2019 Sep 09;121(6):431-433 [FREE Full text] [doi: 10.1038/s41416-019-0535-1] [Medline: 31395951]

45. Lundervold AS, Lundervold A. An overview of deep learning in medical imaging focusing on MRI. Z Med Phys 2019 May;29(2):102-127 [FREE Full text] [doi: 10.1016/j.zemedi.2018.11.002] [Medline: 30553609]

46. Brisson A, Pereira G, Prada R, Paiva A, Louchart S, Suttie N, et al. Artificial intelligence and personalization opportunities for serious games. Proc AAAI Conf Artificial Intell Interact Digital Entertainment 2021 Jun 30;8(5):51-57. [doi: 10.1609/aaai.2021.3527]

47. Mobasher B. Intelligent Techniques for Web Personalization: IJCAI 2003 Workshop, ITWP 2003, Acapulco, Mexico, August 11, 2003, Revised Selected Papers. Berlin, Heidelberg: Springer; 2005.

48. Yoganarasimhan H. Search personalization using machine learning. Manag Sci 2020 Mar;66(3):1045-1070. [doi: 10.1287/mnsc.2018.3245]

49. Ali K, Farrer L, Gulliver A, Griffiths KM. Online peer-to-peer support for young people with mental health problems: a systematic review. JMIR Ment Health 2015 May 19;2(2):e19 [FREE Full text] [doi: 10.2196/mental.4418] [Medline: 26543923]

50. Biagianti B, Quraishi SH, Schlosser DA. Potential benefits of incorporating peer-to-peer interactions into digital interventions for psychotic disorders: a systematic review. Psychiatr Serv 2018 Apr 01;69(4):377-388 [FREE Full text] [doi: 10.1176/appi.ps.201700283] [Medline: 29241435]

51. Eysenbach G, Powell J, Englesaklis M, Rizo C, Stern A. Health related virtual communities and electronic support groups: systematic review of the effects of online peer to peer interactions. BMJ 2004 May 15;328(7449):1166 [FREE Full text] [doi: 10.1136/bmj.328.7449.1166] [Medline: 15142921]

52. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): checklist and explanation. Ann Intern Med 2018 Oct 02;169(7):467-473 [FREE Full text] [Medline: 30178033]
55. Tricco AC, Lillie E, Zarin W, O'Brien K, Colquhoun H, Kastner M, et al. A scoping review on the conduct and reporting of scoping reviews. BMC Med Res Methodol 2016 Feb 09;16:15 [FREE Full text] [doi: 10.1186/s12874-016-0116-4] [Medline: 26857112]
56. Storman D, Jemiolo P, Swierz MJ, Bala MM, Prokop-Dorner A, Gotfryd M. Peer-to-peer online interventions for people with mental illnesses. Open Science Framework. 2020 Aug 18. URL: https://osf.io/3azw/ [accessed 2022-11-30]
57. Greenwood E, Bales RF. Interaction process analysis: a method for the study of small groups. Am Sociol Rev 1950 Oct;15(5):693. [doi: 10.2307/2086941]
58. CASP Checklist. Critical Appraisal Skills Programme. URL: https://casp-uk.net/casp-tools-checklists/ [accessed 2022-05-13]
59. Manikandan S. Measures of dispersion. J Pharmacol Pharmacotherapeutics 2022 Apr 11;2(4):315-316. [doi: 10.4109/0976-500x.85931]
60. Krysinska K, Lester D. Post-traumatic stress disorder and suicide risk: a systematic review. Arch Suicide Res 2010 Jan 29;14(1):1-23. [doi: 10.1080/1381110903478997] [Medline: 20112140]
61. Vilone G, Longo L. Explainable artificial intelligence: a systematic review. arXiv 2020. [doi: 10.48550/arXiv.2006.00093]
62. van Eck NJ, Waltman L. VOSviewer manual. Univeristeit Leiden. 2013 Jan 1. URL: https://www.vosviewer.com/documentation/Manaul_VOSviewer_1.5.4.pdf [accessed 2022-05-13]
63. Eghdam A, Hamidi U, Bartfai A, Koch S. Facebook as communication support for persons with potential mild acquired cognitive impairment: a content and social network analysis study. PLoS One 2018;13(1):e0191878 [FREE Full text] [doi: 10.1371/journal.pone.0191878] [Medline: 29377930]
64. Greiner C, Chatton A, Khazaal Y. Online self-help forums on cannabis: a content assessment. Patient Educ Couns 2017 Oct;100(10):1943-1950. [doi: 10.1016/j.pec.2017.06.001] [Medline: 28602568]
65. Andalibi N, Ozturk P, Forte A. Sensitive self-disclosures, responses, and social support on Instagram: the case of #depression. JMIR Ment Health 2022 | vol. 9 | iss. 12 | e36056 | p. 17https://mental.jmir.org/2022/12/e36056
66. Chen AT, Slattery K, Tomasino KN, Rubanovich CK, Bardsley LR, Mohr DC. Challenges and benefits of an internet-based intervention with a peer support component for older adults with depression: qualitative analysis of textual data. J Med Internet Res 2020 Jun 16;22(6):e17586 [FREE Full text] [doi: 10.2196/17586] [Medline: 32543448]
67. Beck SJ, Paskewitz EA, Anderson WA, Bourdeaux R, Currie-Mueller J. The task and relational dimensions of online social support. Health Commun 2017 Mar;32(3):347-355. [doi: 10.1080/10497323.2016.1138383] [Medline: 27268509]
68. Bronstein J. Is this OCD?: exploring conditions of information poverty in online support groups dealing with obsessive compulsive disorder. Inform Res 2014;19(4).
69. Brown S, Altice FL. Self-management of buprenorphine/naloxone among online discussion board users. Subst Use Misuse 2014 Jun 29;49(8):1017-1024 [FREE Full text] [doi: 10.3109/10826084.2014.884849] [Medline: 24779501]
70. Chen AT, Slattery K, Tommaso KN, Rubanovich CK, Bardsley LR, Mohr DC. Challenges and benefits of an internet-based intervention with a peer support component for older adults with depression: qualitative analysis of textual data. J Med Internet Res 2020 Jun 16;22(6):e17586 [FREE Full text] [doi: 10.2196/17586] [Medline: 32543448]
71. Cunningham JA, van Mierlo T, Fournier R. An online support group for problem drinkers: AlcoholHelpCenter.net. Patient Educ Couns 2008 Feb;70(2):193-198. [doi: 10.1016/j.pec.2007.10.003] [Medline: 18022340]
72. Doran J. Posting incognito ... males with eating problems: online emotional expression and support. J Cyber Ther Rehabil 2011;4(3):341.
73. Edward K, Robins A. Dual diagnosis, as described by those who experience the disorder: using the Internet as a source of data. Int J Ment Health Nurs 2012 Dec;21(6):550-559. [doi: 10.1111/j.1447-0349.2012.00833.x] [Medline: 22830579]
74. Evans M, Donelle L, Hume-Loveland L. Social support and online postpartum depression discussion groups: a content analysis. Patient Educ Couns 2012 Jun;87(3):405-410. [doi: 10.1016/j.pec.2011.09.011] [Medline: 22019021]
75. Gajaria A, Yeung E, Goodale T, Charach A. Beliefs about attention-deficit/hyperactivity disorder and response to stereotypes: youth postings in Facebook groups. J Adolesc Health 2011 Jul;49(1):15-20. [doi: 10.1016/j.jadohealth.2010.09.004] [Medline: 21700151]
76. Gavin J, Rodham K, Poyer H. The presentation of “pro-anorexia” in online group interactions. Qual Health Res 2008 Mar 01;18(3):325-333. [doi: 10.1177/1049732307311640] [Medline: 18235156]
77. Giles DC, Newbold J. Self- and other-diagnosis in user-led mental health online communities. Qual Health Res 2011 Mar 25;21(3):419-428. [doi: 10.1177/1049732310381388] [Medline: 20739589]
78. Horgan A, McCarthy G, Sweeney J. An evaluation of an online peer support forum for university students with depressive symptoms. Arch Psychiatr Nurs 2013 Apr;27(2):84-89. [doi: 10.1016/j.apnu.2012.12.005] [Medline: 23540518]
79. Horgan A, McCarthy G, Sweeney J. An evaluation of an online peer support forum for university students with depressive symptoms. Arch Psychiatr Nurs 2013 Apr;27(2):84-89. [doi: 10.1016/j.apnu.2012.12.005] [Medline: 23540518]
80. Juarascio AS, Shaob A, Timko C. Pro-eating disorder communities on social networking sites: a content analysis. Eat Disord 2010 Sep 30;18(5):393-407. [doi: 10.1080/10604026.2010.519118] [Medline: 20865593]
81. Kantrowitz-Gordon I. Internet confessions of postpartum depression. Issues Ment Health Nurs 2013 Dec 25;34(12):874-882. [doi: 10.3109/01612840.2013.806618] [Medline: 24274243]
81. Kendal S, Kirk S, Elvey R, Catchpole R, Pryjmachuk S. How a moderated online discussion forum facilitates support for young people with eating disorders. Health Expect 2017 Feb 03;20(1):98-111 [FREE Full text] [doi: 10.1111/hex.12439] [Medline: 26275547]

82. Keski-Rahkonen A, Tozzi F. The process of recovery in eating disorder sufferers’ own words: an Internet-based study. Int J Eat Disord 2005;37 Suppl(S1):S80-6; discussion S87. [doi: 10.1002/eat.20123] [Medline: 15852327]

83. Lavis A, Winter R. #Online harms or benefits? An ethnographic analysis of the positives and negatives of peer-support around self-harm on social media. J Child Psychol Psychiatry 2020 Aug 27;61(8):842-854. [doi: 10.1111/jcpp.13245] [Medline: 32459004]

84. Lerman BI, Lewis SP, Grogan GJ, Hudson CC, Johnson E. Teen depression groups on Facebook: a content analysis. J Adolesc Res 2016 Oct 22;32(6):719-741. [doi: 10.1177/0743558416673717]

85. Lord VM, Reiboldt W, Gontitzke D, Parker E, Peterson C. Experiences of recovery in binge-eating disorder: a qualitative approach using online message boards. Eat Weight Disord 2018 Feb 31;23(1):95-105. [doi: 10.1007/s40519-016-0335-z] [Medline: 27796846]

86. Moore D, Ayers S, Drey E. A thematic analysis of stigma and disclosure for perinatal depression on an online forum. JIMR Ment Health 2016 May 19;3(2):e18 [FREE Full text] [doi: 10.2196/mental.5611] [Medline: 27197516]

87. Musgrove TE, Strong T. Doing recovery online. Qual Health Res 2013 Mar;23(3):313-325. [doi: 10.1177/1049732312468296] [Medline: 23028020]

88. Naslund JA, Grande SW, Aschbrenner KA, Elwyn G. Naturally occurring peer support through social media: the experiences of individuals with severe mental illness using YouTube. PLoS One 2014 Oct 15;9(10):e110171 [FREE Full text] [doi: 10.1371/journal.pone.0110171] [Medline: 25333470]

89. Park A, Conway M, Chen AT. Examining thematic similarity, difference, and membership in three online mental health communities from reddit: a text mining and visualization approach. Comput Human Behav 2018 Jan;78:98-112 [FREE Full text] [doi: 10.1016/j.chb.2017.09.001] [Medline: 29456286]

90. Prescott J, Rathbone AL, Brown G. Online peer to peer support: qualitative analysis of UK and US open mental health Facebook groups. Digit Health 2020 Dec 10;6:2055207620979209 [FREE Full text] [doi: 10.1177/2055207620979209] [Medline: 33354335]

91. Salzmann-Erikson M, Hıçdurmaz D. Use of social media among individuals who suffer from post-traumatic stress: a qualitative analysis of narratives. Qual Health Res 2017 Jan 09;27(2):285-294. [doi: 10.1177/1049732315627364] [Medline: 26825480]

92. Sharkey S, Smithson J, Hewis E, Jones R, Emmens T, Ford T, et al. Supportive interchanges and face-work as ‘protective talk’ in an online self-harm support forum. Commun Med 2012 Feb 19;9(1):71-82. [doi: 10.1558/cvm.v9i1.71] [Medline: 23763238]

93. Smithson J, Sharkey S, Hewis E, Jones RB, Emmens T, Ford T, et al. Membership and boundary maintenance on an online self-harm forum. Qual Health Res 2011 Nov 29;21(11):1567-1575. [doi: 10.1177/1049732311413784] [Medline: 21715606]

94. Soussan C, McLeary A, Optican A, Cahn E, Krauss MJ, Fitzsimmons-Craft EE, et al. A content analysis of the positives and negatives of peer-support around self-harm on social media. JIMR Ment Health 2020 May 19;3(2):71-83. [doi: 10.1089/1049310050191755] [Medline: 30553449]

95. Storman JM, marsh J, Watts A, Findlay S. Fighting the battle of recovery together: a content analysis of anonymous posts in an online substance use forum. Issues Ment Health Nurs 2020 Feb 06;41(2):102-112. [doi: 10.1080/01612840.2019.1646364] [Medline: 31386598]

96. Ulbrich-Tegetmeyer S, Kräuchi K. #You know, who’s the thinnest?#: combating surveillance and creating safety in coping with eating disorders online. CyberPsychol Behav 2000 Oct;3(5):761-783. [doi: 10.1089/10949310050191755] [Medline: 10949310050191755]

97. Ulbrich-Tegetmeyer S, Kräuchi K. #You know, who’s the thinnest?#: combating surveillance and creating safety in coping with eating disorders online. CyberPsychol Behav 2000 Oct;3(5):761-783. [doi: 10.1089/10949310050191755] [Medline: 10949310050191755]
103. Sik D, Németh R, Katona E. Topic modelling online depression forums: beyond narratives of self-objectification and self-blaming. J Ment Health 2021 Sep 28;1-10. [doi: 10.1080/09638237.2021.1979493] [Medline: 34582309]

104. Bendall S, Truss K, Liao Siling J, Phillips L. What stops young people from seeking help for the effects of trauma? A qualitative analysis of internet forums. In: Proceedings of the 11th International Conference on Early Intervention in Mental Health –“Prevention and Early Intervention: Broadening the Scope”. 2018 Presented at: IEPA 11th International Conference on Early Intervention in Mental Health –“Prevention and Early Intervention: Broadening the Scope”; 7–10 October 2018; Boston, Massachusetts, USA. [doi: 10.1111/eip.12723]

105. McGregor KA, Clancy O. 100. Starving for support: natural language processing and machine learning analysis of anorexia nervosa in pro-eating disorder communities. J Adolesc Health 2019 Feb;64(2):S53. [doi: 10.1016/j.jadohealth.2018.10.016]

106. Parsons C, McGrath D. Medication information needs of people with Parkinson’s disease and their carers: a qualitative study using an online discussion forum. Int J Pharm Pract 2019;27(S2):9.

107. Zaja N, Rukavina TV, Brborović O, Uzun S, Mimica N. Reasons for using depression Internet forums in Croatia. In: Proceedings of the 26th European Congress of Psychiatry. 2018 Presented at: 26th European Congress of Psychiatry; Mar, 2018; Nice, France. [doi: 10.26226/morressier.5a6ef3edd462b80290b58142]

108. Zhu L, Mehta N, Wu W, Savage R, Lam K, Ghuman I, et al. P4-401: dementia 2.0: an exploratory analysis of twitter and health forum data. Alzheimer's Dementia 2019 Jul 01;15(P1456. [doi: 10.1016/j.jalz.2019.06.4073]

109. Dixon-Ward KC, Chan SW. 'Faking it': exploring adolescent perceptions of depression (in)authenticity and 'attention seeking'. Br J Clin Psychol 2022 Jun 29;61(2):177-196. [doi: 10.1111/bjc.12339] [Medline: 34716598]

110. Kepern W, Meacham MC, Nobles AL. Types and sources of stigma on opioid use treatment and recovery communities on reddit. Subst Use Misuse 2022 Jul 09;57(10):1511-1522. [doi: 10.1080/10826084.2022.2091786] [Medline: 35815614]

111. Bickerstaff JM, Karim S, Whitman RK, Cypher A, Wiener S, Radovic A. “You have people here to help you, people like me.” a qualitative analysis of a blogging intervention for adolescents and young adults with depression or anxiety. J Technol Behav Sci 2021 Dec 15;6(4):578-588. [doi: 10.1007/s41347-021-00210-w] [Medline: 34926793]

112. Page MJ, Moher D, Bossuyt PM, Bountron I, Hoffmann TC, Mulrow CD, et al. PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. BMJ 2021 Mar 29;372:n160 [FREE Full text] [doi: 10.1136/bmj.n160] [Medline: 33781993]

113. Abel S, Machin T, Brownlow C. Support, socialise and advocate: an exploration of the stated purposes of Facebook autism groups. Res Autism Spectrum Disorder 2019 May;61:10-21. [doi: 10.1016/j.rasd.2019.01.009]

114. Athanasopoulou C, Sakellari E. Facebook and health information: content analysis of groups related to schizophrenia. Stud Health Technol Inform 2015;213:255-258. [Medline: 26153008]

115. Fraga B, da Silva A, Murai F. Online social networks in health care: a study of mental disorders on Reddit. In: Proceedings of the 2018 IEEE/WIC/ACM International Conference on Web Intelligence (WI). 2018 Presented at: 2018 IEEE/WIC/ACM International Conference on Web Intelligence (WI); Dec 03-06, 2018; Santiago, Chile. [doi: 10.1109/wi.2018.00-36]

116. Lamy FR, Danialutyte R, Nahhas RW, Barratt MJ, Smith AG, Sheth A, et al. Increases in synthetic cannabinoids-related harms: results from a longitudinal web-based content analysis. Int J Drug Policy 2017 Jun;44:121-129 [FREE Full text] [doi: 10.1016/j.drugpo.2017.05.007] [Medline: 28578250]

117. Linden M, Pirsch C. Negative and helpful statements in a patient only or therapist guided internet forum in the aftercare for psychosomatic inpatients. Psychiatr Danub 2017 Dec 30;29(4):446-450 [FREE Full text] [doi: 10.24869/psyd.2017.446] [Medline: 29197201]

118. Lyons M, Aksayli ND, Brewer G. Mental distress and language use: linguistic analysis of discussion forum posts. Comput Human Behav 2018 Oct;87:207-211. [doi: 10.1016/j.chb.2018.05.035]

119. Martínez-Pérez B, de la Torre-Díez I, Bargiela-Flórez B, López-Coronado M, Rodrigues JJ. Content analysis of neurodegenerative and mental diseases social groups. Health Informatics J 2015 Dec 03;21(4):267-283. [doi: 10.1177/1460458214525615] [Medline: 24698768]

120. Mazel S, Zisman-Ilini Y, Hennig S, Garnick D, Nicholson J. Virtual engagement in a social media community of mothers with substance use disorders: content analysis. JMIR Form Res 2021 Jun 24;5(6):e24353 [FREE Full text] [doi: 10.2196/24353] [Medline: 34184993]

121. McCaig D, Elliott MT, Siew CS, Walasek L, Meyer C. Profiling commenters on mental health-related online forums: a methodological example focusing on eating disorder-related commenters. JMIR Ment Health 2019 Apr 22;6(4):e12555 [FREE Full text] [doi: 10.2196/12555] [Medline: 31089715]

122. Moessner M, Feldhege J, Wolf M, Bauer S. Analyzing big data in social media: text and network analyses of an eating disorder forum. Int J Eat Disord 2018 Jul 10;51(7):656-667. [doi: 10.1002/eat.22878] [Medline: 29746710]

123. Mokkenstorm JK, Mérelle SY, Smit JH, Beckman AT, Kerkhof AJ, Huisman A, et al. Exploration of benefits and potential harmful effects of an online forum for visitors to the suicide prevention platform in the netherlands. Crisis 2020 May;41(3):205-213. [doi: 10.1027/0227-5910/a000627] [Medline: 31657643]

124. Nguyen T, O’Dea B, Larsen M, Phung D, Venkatesh S, Christensen H. Using linguistic and topic analysis to classify sub-groups of online depression communities. Multimed Tools Appl 2015 Dec 21;76(8):10653-10676. [doi: 10.1007/s11042-015-3128-x]
125. Selby P, van Mierlo T, Voci SC, Parent D, Cunningham JA. Online social and professional support for smokers trying to quit: an exploration of first time posts from 2652 members. J Med Internet Res 2010 Aug 18;12(3):e34 [FREE Full text] [doi: 10.2196/mir.1340] [Medline: 20719739]

126. Tan YT, Rehm IC, Stevenson JL, De Foe A. Social media peer support groups for obsessive-compulsive and related disorders: understanding the predictors of negative experiences. J Affect Disord 2021 Feb 15;281:661-672. [doi: 10.1016/j.jad.2020.11.094] [Medline: 33234279]

127. Winkel S, Groen G, Petermann F. [Social support in suicide forums]. Prax Kinderpsychol Kinderpsychiatr 2005 Nov;54(9):714-727. [Medline: 16305019]

128. Xu R, Zhang Q. Understanding online support groups for depression: social network and linguistic perspectives. J Med Internet Res 2016 Mar 18;18(3):e63 [FREE Full text] [doi: 10.2196/mir.5042] [Medline: 26966078]

129. Ahlström BH, Wentz E. Difficulties in everyday life: young persons with attention-deficit/hyperactivity disorder and autism spectrum disorders perspectives. A chat-log analysis. Int J Qual Stud Health Well being 2014 May 28;9(1):23376 [FREE Full text] [doi: 10.3402/qhw.v9.23376] [Medline: 24875238]

130. Carron-Arthur B, Reynolds J, Bennett K, Bennett A, Griffiths KM. What's all the talk about? Topic modelling in a mental health internet support group. BMC Psychiatry 2016 Oct 28;16(1):367 [FREE Full text] [doi: 10.1186/s12888-016-1073-5] [Medline: 27793131]

131. Cavazos-Rehg PA, Krauss MJ, Bowles S, Connolly S, Rosas C, Bharadwaj M, et al. A content analysis of depression-related Tweets. Comput Human Behav 2016 Jan 01;54:351-357 [FREE Full text] [doi: 10.1016/j.chb.2015.08.023] [Medline: 26392678]

132. Cohn AM, Amato MS, Zhao K, Wang X, Cha S, Pearson JL, et al. Discussions of alcohol use in an online social network for smoking cessation: analysis of topics, sentiment, and social network centrality. Alcohol Clin Exp Res 2019 Jan;43(1):108-114 [FREE Full text] [doi: 10.1111/acer.13906] [Medline: 30326140]

133. Davis S, Lewis CA. Addiction to self-harm? The case of online postings on self-harm message boards. Int J Ment Health Addiction 2018 Sep 27;17(4):1020-1035. [doi: 10.1007/s11469-018-9975-8]

134. Dempsey M, Foley S, Frost N, Murphy R, Willis N, Robinson S, et al. Am I lazy, a drama queen or depressed? A journey through a pluralistic approach to analysing accounts of depression. Qual Res Psychol 2019 Oct 17;19(2):473-493. [doi: 10.1080/14780887.2019.1677833]

135. Feuston J. Algorithms, oppression, and mental illness on social media. In: Proceedings of the Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems. 2019 Presented at: CHI ’19: CHI Conference on Human Factors in Computing Systems; May 4 - 9, 2019; Glasgow Scotland UK. [doi: 10.1145/3290607.3299072]

136. Mancera KC, De Santacruz C, Salamanca MA. ["Accepting demented minds"]. Opinion group, information and support on Huntington's disease online support group. Patient Educ Couns 2007 Oct;68(2):173-178. [Medline: 16305019]

137. Mitchell JT, Sweitzer MM, Tunno AM, Kollins SH, McClernon FJ. "I use weed for my ADHD": a qualitative analysis of online forum discussions on cannabis use and ADHD. PLoS One 2016 May 26;11(5):e0156614 [FREE Full text] [doi: 10.1371/journal.pone.0156614] [Medline: 27227537]

138. Schmidt M, Dillon PJ, Jackson BM, Pirkey P, Kedia SK. "Gave me a line of ice and I got hooked": exploring narratives of initiating methamphetamine use. Public Health Nurs 2019 Jan 18;36(1):18-27. [doi: 10.1111/phn.12568]

139. Summers RF. Adaptive and maladaptive means of using facebook: a qualitative pilot study to inform suggestions for development of a future intervention for depression. J Psychiatr Pract 2015 Nov;21(6):73-74 [FREE Full text] [doi: 10.1097/PRA.0000000000000109] [Medline: 26554330]

140. Valeriani G, Corazza O, Bersani FS, Melcore C, Metastasio A, Bersani G, et al. Olanzapine as the ideal "trip terminator"? Analysis of online reports relating to antipsychotics' use and misuse following occurrence of novel psychoactive substance-related psychotic symptoms. Hum Psychopharmacol 2015 Jul 28;30(4):249-254. [doi: 10.1002/hup.2431]

141. Svedberg F, Leppanen J, Austin A, Tchanturia K. Different pathways, same goals: a large-scale qualitative study of autistic patient-generated definitions of recovery from an eating disorder. Eur Eat Disord Rev 2022 Sep 24;30(5):580-591. [doi: 10.1002/erv.2873] [Medline: 34820930]

142. Coulson NS, Buchanan H, Aubeluck A. Social support in cyberspace: a content analysis of communication within a Huntington's disease online support group. Patient Educ Couns 2007 Oct;68(2):173-178. [doi: 10.1016/j.pec.2007.06.002] [Medline: 17629440]

143. Hacker A, McCabe MP. A qualitative evaluation of online chat groups for women completing a psychological intervention for female sexual dysfunction. J Sex Marital Ther 2013 Jun 14;40(1):58-68. [doi: 10.1080/0092623x.2012.675020]

144. Li A, Jiao D, Liu X, Zhu T. A comparison of the psycholinguistic styles of schizophrenia-related stigma and depression-related stigma on social media: content analysis. J Med Internet Res 2020 Apr 21;22(4):e16470 [FREE Full text] [doi: 10.2196/16470] [Medline: 33215289]

145. Mbaa M, Collins-Pisano C, Fortuna K. Older adult peer support specialists' age-related contributions to an integrated medical and psychiatric self-management intervention: qualitative study of text message exchanges. JMIR Form Res 2021 Mar 02;5(3):e22950 [FREE Full text] [doi: 10.2196/22950] [Medline: 33650979]
146. Evans K, Rennick-Egglestone S, Cox S, Kuipers Y, Spiby H. Remotely delivered interventions to support women with symptoms of anxiety in pregnancy: mixed methods systematic review and meta-analysis. J Med Internet Res 2022 Feb 15;24(2):e28093 [FREE Full text] [doi: 10.2196/28093] [Medline: 35166688]

147. Cutrona CE, Suhr JA. Controllability of stressful events and satisfaction with spouse support behaviors. Commun Res 2016 Jun 30;49(2):154-174. [doi: 10.1177/009363992019000202]

148. Cohen S, Wills TA. Stress, social support, and the buffering hypothesis. Psychol Bull 1985 Sep;98(2):310-357. [Medline: 3901065]

149. Oakley A. Social Support and Motherhood (Reissue): The Natural History of a Research Project. Old Park Hill Bristol: Bristol University Press, Policy Press; 2018.

150. Tong ST, Heinemann-Lafeve D, Jeon J, Kolodziej-Smith R, Warshay N. The use of pro-ana blogs for online social support. Eat Disord 2013 Oct;21(5):408-422. [doi: 10.1080/10640266.2013.827538] [Medline: 24044597]

151. Bauer R, Bauer M, Spießl H, Kagerbauer T. Cyber-support: an analysis of online self-help forums (online self-help forums in bipolar disorder). Nord J Psychiatry 2013 Jun;67(3):185-190. [doi: 10.3109/08394888.2012.700734] [Medline: 22817138]

152. Morse J, Field P. Nursing Research The Application of Qualitative Approaches. Cham: Springer; 1996.

153. Gaysynsky A, Romansky-Poulin K, Arpa S. "My YAP family": analysis of a Facebook group for young adults living with HIV. AIDS Behav 2015 Jun 4;19(6):947-962. [doi: 10.1007/s10461-014-0887-8] [Medline: 25186783]

154. Yip JW. Evaluating the communication of online social support: a mixed-methods analysis of structure and content. Health Commun 2020 Sep 03;35(10):1210-1218. [doi: 10.1080/10410236.2019.1623643] [Medline: 31154856]

155. Struik LL, Baskerville NB. The role of Facebook in Crush the Crave, a mobile- and social media-based smoking cessation intervention: qualitative framework analysis of posts. J Med Internet Res 2014 Jul 11;16(7):e170 [FREE Full text] [doi: 10.2196/jmir.3189] [Medline: 25016998]

156. Rimé B. Interpersonal emotion regulation. In: Handbook of Emotion Regulation. New York: The Guilford Press; 2007.

157. Liu Y, Kornfield R, Shaw BR, Shah DV, McTavish F, Gustafson DH. When support is needed: social support solicitation and provision in an online alcohol use disorder forum. Digit Health 2017 May 22;3:2055207617704274 [FREE Full text] [doi: 10.1177/2055207617704274] [Medline: 29942595]

158. Wang Y, Kraut RE, Levine JM. Eliciting and receiving online support: using computer-aided content analysis to examine the dynamics of online social support. J Med Internet Res 2015 Apr 20;17(4):e99 [FREE Full text] [doi: 10.2196/jmir.3558] [Medline: 25896033]

159. Willis J, Jost M, Nilakanta R. Foundations of Qualitative Research Interpretive and Critical Approaches. Thousand Oaks, California, United States: SAGE Publications; 2007.

160. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. Acad Med 2014 Sep;89(9):1245-1251 [FREE Full text] [doi: 10.1097/ACM.0000000000000388] [Medline: 24979285]

161. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care 2007 Dec;19(6):349-357. [doi: 10.1093/intqhc/mzm042] [Medline: 17872937]

162. Levitt HM, Bamberg M, Creswell JW, Frost DM, Josselson R, Su CM. Interpersonal emotion regulation. In: Handbook of Emotion Regulation. New York: The Guilford Press; 2007.

163. Morse J, Field P. Nursing Research The Application of Qualitative Approaches. Cham: Springer; 1996.

164. Cutrona CE, Suhr JA. Controllability of stressful events and satisfaction with spouse support behaviors. Commun Res 2016 Jun 30;49(2):154-174. [doi: 10.1177/009363992019000202]

165. Cohen S, Wills TA. Stress, social support, and the buffering hypothesis. Psychol Bull 1985 Sep;98(2):310-357. [Medline: 3901065]

166. Chaffey L, Bigby C. Health education by peers with spinal cord injury: a scoping review. J Dev Phys Disabil 2017 Sep;29(3):177-185. [Medline: 28755745]

167. Ethical Guidelines for group psychotherapists. International Association for Group Psychotherapy and Group Processes. 2009. URL: https://www.iagp.com/about-ne/ethical-guidelines-for-group-psychotherapists/ [accessed 2022-05-13]

168. Kowitt SD, Ellis KR, Carlisle V, Bhushan NL, Black KZ, Brodar K, et al. Peer support opportunities across the cancer care continuum: a systematic scoping review of recent peer-reviewed literature. Support Care Cancer 2019 Jan 6;27(1):97-108 [FREE Full text] [doi: 10.1007/s00520-018-4479-4] [Medline: 30293093]

169. Bowersox NW, Jagusch J, Garlick J, Chen JJ, Pfeiffer PN. Peer-based interventions targeting suicide prevention: a scoping review. Am J Community Psychol 2021 Sep 15;68(1-2):232-248 [FREE Full text] [doi: 10.1002/ajcp.12510] [Medline: 33720444]
170. Schlichthorst M, Ozols I, Reifels L, Morgan A. Lived experience peer support programs for suicide prevention: a systematic scoping review. Int J Ment Health Syst 2020 Aug 12;14(1):65 [FREE Full text] [doi: 10.1186/s13033-020-00396-1] [Medline: 32817757]

171. Carter G, Monaghan C, Santin O. What is known from the existing literature about peer support interventions for carers of individuals living with dementia: a scoping review. Health Soc Care Community 2020 Jul 09;28(4):1134-1151. [doi: 10.1111/hsc.12944] [Medline: 31919974]

172. Newman K, Wang AH, Wang AZ, Hanna D. The role of internet-based digital tools in reducing social isolation and addressing support needs among informal caregivers: a scoping review. BMC Public Health 2019 Nov 09;19(1):1495 [FREE Full text] [doi: 10.1186/s12889-019-7837-3] [Medline: 31706294]

173. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. Int J Social Res Methodol 2005 Feb;8(1):19-32. [doi: 10.1080/1364557032000119616]

174. p2p-online-interactions. GitHub. URL: https://github.com/pawljmlo/p2p-online-interactions [accessed 2022-11-28]

Abbreviations

AI: artificial intelligence
CASP: Critical Appraisal Skills Programme
ML: machine learning
PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PRISMA-ScR: Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews

©Dawid Storman, Paweł Jemiolo, Mateusz Jan Swierz, Zuzanna Sawiec, Ewa Antonowicz, Anna Prokop-Dorner, Marcelina Gotfryd-Burzyńska, Malgorzata M Bala. Originally published in JMIR Mental Health (https://mental.jmir.org), 05.12.2022. This is an open-access article distributed under the terms of the Creative Commons Attribution License (https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work, first published in JMIR Mental Health, is properly cited. The complete bibliographic information, a link to the original publication on https://mental.jmir.org/, as well as this copyright and license information must be included.