Success Factors of Medical Crowdfunding campaigns: A Systematic Review

Xiaoyan Hou, Zhou Chen, Liqin Zhou, Tailai Wu

Submitted to: Journal of Medical Internet Research on: May 04, 2021

Disclaimer: © The authors. All rights reserved. This is a privileged document currently under peer-review/community review. Authors have provided JMIR Publications with an exclusive license to publish this preprint on its website for review purposes only. While the final peer-reviewed paper may be licensed under a CC BY license on publication, at this stage authors and publisher expressively prohibit redistribution of this draft paper other than for review purposes.
Table of Contents

Original Manuscript............................................................................................................................... 5
Supplementary Files................................................................................................................................. 32
                                                                                                           32
                                                                                                           32
Figures ....................................................................................................................................................... 33
  Figure 1................................................................................................................................................ 34
Success Factors of Medical Crowdfunding campaigns: A Systematic Review

Xiaoyan Hou¹; Zhou Chen²; Liqin Zhou¹ PhD; Tailai Wu¹ PhD

¹School of Medicine and Health Management, Huazhong University of Science and Technology, Wuhan 430030, China
²Wuhan CN

2Department of Health Policy and Management, College of Public Health, University of Georgia, Athens, GA, United States
3School of Economics, Faculty of Humanities and Social Sciences, University of Nottingham Ningbo China, Ningbo, China

Corresponding Author:
Tailai Wu PhD
School of Medicine and Health Management, Huazhong University of Science and Technology, Wuhan 430030, China
Hangkong Road 13, Wuhan, China
Wuhan
CN

Abstract

Background: Medical crowdfunding provides opportunities for individuals who lack financial resources to access to health services they need. Despite the popularity of medical crowdfunding, the current understanding of the success of medical crowdfunding campaigns is fragmented and not adequate. A comprehensive review of the success factors of medical crowdfunding is in urgent need.

Objective: This systematic review aims to provide a comprehensive investigation into the factors leading to the success of medical crowdfunding campaigns.

Methods: A search was conducted in PubMed, PsycINFO, Web of Science, ACM Digital Library, and ScienceDirect from 2010 to June 2020. Papers directly and indirectly related to the success of medical crowdfunding campaigns were included. Two reviewers independently extracted information on the success of medical crowdfunding campaigns.

Results: Our search yielded 441 articles, of which 13 met the inclusion criteria. After analyzing these articles, it was found that: (1) Most studies leverage text analysis as their research methods; (2) Medical crowdfunding is increasingly attracting academic attention; (3) There is a lack of consensus on the definition of medical crowdfunding amongst researchers; (4) Four categories of factors that affect the success of medical crowdfunding campaigns are identified: (a) platforms which include factors relate to medical crowdfunding platforms; (b) raisers which include factors relate to the raisers of medical crowdfunding campaigns; (c) donors which include factors relate to the raisers of medical crowdfunding campaigns; (d) campaigns which include factors relate to medical crowdfunding campaigns themselves.

Conclusions: Since there’s no robust synthesis of the success of medical crowdfunding campaigns, it is necessary to conduct this systematic review. Although some limitations exist in our systematic review like more literatures could be included, more categories could be explored, bias and heterogeneity may still exist in the process of review, our study captures the research status of the success of medical crowdfunding campaigns systematically. Overall, our study provides a comprehensive mapping of the research of success of medical crowdfunding campaigns and could be the basis for the future research of this topic.

(JMIR Preprints 04/05/2021:30189)
DOI: https://doi.org/10.2196/preprints.30189

Preprint Settings

1) Would you like to publish your submitted manuscript as preprint?
   Please make my preprint PDF available to anyone at any time (recommended).
   Please make my preprint PDF available only to logged-in users; I understand that my title and abstract will remain visible to all users.
   Only make the preprint title and abstract visible.
   ✔️ No, I do not wish to publish my submitted manuscript as a preprint.

2) If accepted for publication in a JMIR journal, would you like the PDF to be visible to the public?
Yes, please make my accepted manuscript PDF available to anyone at any time (Recommended).
Yes, but please make my accepted manuscript PDF available only to logged-in users; I understand that the title and abstract will remain visible.
Yes, but only make the title and abstract visible (see Important note, above). I understand that if I later pay to participate in the PubMed Now! service, my accepted manuscript PDF will automatically be made openly available.
Success Factors of Medical Crowdfunding campaigns: A Systematic Review

Abstract:
Background: Medical crowdfunding provides opportunities for individuals who lack financial resources to access to health services they need. Despite the popularity of medical crowdfunding, the current understanding of the success of medical crowdfunding campaigns is fragmented and not adequate. A comprehensive review of the success factors of medical crowdfunding is in urgent need.
Objective: This systematic review aims to provide a comprehensive investigation into the factors leading to the success of medical crowdfunding campaigns.
Methods: A search was conducted in PubMed, PsycINFO, Web of Science, ACM Digital Library, and ScienceDirect from 2010 to June 2020. Papers directly and indirectly related to the success of medical crowdfunding campaigns were included. Two reviewers independently extracted information on the success of medical crowdfunding campaigns.
Results: Our search yielded 441 articles, of which 13 met the inclusion criteria. After analyzing these articles, it was found that: (1) Most studies leverage text analysis as their research methods; (2) Medical crowdfunding is increasingly attracting academic attention; (3) There is a lack of consensus on the definition of medical crowdfunding amongst researchers; (4) Four categories of factors that affect the success of medical crowdfunding campaigns are identified: (a) platforms which include factors relate to medical crowdfunding platforms; (b) raisers which include factors relate to the raisers of medical crowdfunding campaigns; (c) donors which include factors relate to the raisers of medical crowdfunding campaigns; (d) campaigns which include factors relate to medical crowdfunding campaigns themselves.
Conclusions: Since there’s no robust synthesis of the success of medical crowdfunding campaigns, it is necessary to conduct this systematic review. Although some limitations exist in our systematic review like more literatures could be included, more categories could be explored, bias and heterogeneity may still exist in the process of review, our study captures the research status of the success of medical crowdfunding campaigns systematically. Overall, our study provides a comprehensive mapping of the research of success of medical crowdfunding campaigns and could be the basis for the future research of this topic.
Keywords: Medical Crowdfunding; Success factor; Systematic review; Methods; Theories; Conceptions

Introduction

Crowdfunding has a massive impact on how people access health care services [1]. Due to the low requirement and easy set-up of crowdfunding websites, the usage of crowdfunding platforms for health-related fundraising is getting increasingly popular. Crowdfunding platforms like GoFundMe, Kickstarter, and FundRazr are highly utilized for raising funds for a variety of causes, especially medical needs [2]. Some of the crowdfunding websites report that medical campaigns rank as their top-grossing category of crowdfunding campaigns [3]. The usage of crowdfunding websites for
medical expenses is expected to increase by 25% per year [3]. Online medical crowdfunding emerged in the post-2008 economic context, during which the economic crunch led to an equally enthusiastic increase in the use and accessibility of social media platforms [4]. Medical crowdfunding is donations-based crowdfunding and dedicated to raise money for those who need for medical related costs. Medical crowdfunding could be people’s response towards the gaps of national health payment systems [5]. Many health needs which are not met by health systems with national insurance coverage are reflected in medical crowdfunding platforms [5–7]. The lower national insurance coverage is, the greater number of medical crowdfunding projects will appear [8]. The benefits of medical crowdfunding include expanding funder participation in health market, improving the access to financial support, drawing funding to neglected health issues and improving social engagement, etc [9]. Medical crowdfunding also has been shown to cut down personal bankruptcy numbers [10]. Therefore, it is becoming an important make up way to deal with medical financial issues.

Generally, the success of a medical crowdfunding campaign could be defined as the degree which the medical crowdfunding campaign achieve or exceed the goals which are set by fundraisers. However, despite the convenience and popularity of medical crowdfunding websites, the success rate of medical crowdfunding campaigns on various platforms varies dramatically. For example, in China, campaigns have been reported to achieve just 18% of their goals [11], whereas, in the United States, medical crowdfunding campaigns have achieved over 40% of their goals on average [4]. Overall, only 10% of the medical crowdfunding campaigns have been reported to have reached their fundraising amount targets [4]. Some campaigns have reached their fundraising target within a short time, while others have struggled to raise their target amount. Success factors of medical crowdfunding campaigns are factors which lead the campaigns achieve or exceed the goals which are set by fundraisers [12]. Thus, they could help improve the success rate of medical crowdfunding campaign, then solving raisers’ financial problems related to medical difficulties. Therefore, it is
necessary to identify the success factors of medical crowdfunding.

Medical crowdfunding can not only make up for the deficiency of medical security system, but also deal with the problems of limited financing channels and low utilization rate of private capital [1,13,14]. Meanwhile, negative consequences of medical crowdfunding have also been increasing and become visible [3,15–17]. Factors including low entry barriers to launch and donate to campaigns, the separation between raisers and donators, and anonymity could increase the risk of fraud in medical crowdfunding campaigns [18,19]. Therefore, the importance and potential issues of medical crowdfunding has stimulated the interest of academic researchers [20]. However, current understanding of medical crowdfunding, especially the success factors is defective. Previous literatures have considered the success factors of medical crowdfunding campaigns, but they all examine the factors from different perspectives by using samples from different countries. For example, Durand et al. only considered textual features as the success factors [12]. Thus, current literature on the success factors of medical crowdfunding campaigns is segment and few of them give a holistic understanding of the factors. Therefore, we take a systematic review which systematically search, critically appraise, and synthesize studies, to explore the success factors of medical crowdfunding campaigns [21]. The reasons why we use the systematic review, rather than other methods, are as follows: First, the systematic review could provide a comprehensive understanding concerning the success factors of medical crowdfunding campaigns. The comprehensive understanding could be the solid basis for further studies of this topic. Second, the systematic review could limit bias in identifying and rejecting bias by using explicit methods. Third, conclusions of the systematic review could be more reliable and accurate because it summarizes previous literatures systematically. Forth, the systematic review could reduce the delay between scientific discoveries and implementation. At last, the generalizability of findings could be established by the comparison among studies in the systematic review [22]. In a word, this study aims to provide a comprehensive investigation into the factors leading to the success of medical
crowdfunding campaigns by reviewing previous literature systematically.

**Method**

**Literature search**

Five databases including PubMed, PsycINFO, Web of Science, ACM Digital Library, and ScienceDirect were used to search the relevant literature. These databases were chosen because they cover most disciplines that study medical crowdfunding, namely, medicine, information, psychology, global health, computer science, and business economics. For this review, medical crowdfunding was broadly defined. The search terms were "crowdfunding or crowd funding" and "health or disease or illness or medical or hospital or treatment." The database search was conducted on June 8, 2020, and the results were exported to Zotero and organized into folders based on the databases. Then, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to document the review process was used. Keywords, synonyms used in this search revolved around two concepts – crowdfunding, and health (see Table 1). The literature retrieval was mainly conducted by two of authors: one had the degree of Doctor of Philosophy and majored in Library and Information Science, while the other author is a master student who also majored in Library and Information Science. They are both the experts of performing the literature search.

| Search terms |
|--------------|
| (searched in keyword, boolean/phrase search modes, and all fields, within PubMed, PsycINFO, Web of Science, ACM Digital Library, and ScienceDirect respectively) |
| 11 crowdfunding or crowd funding |
| 22 health or disease or illness or medical or hospital or treatment |
| 33 1 and 2 |
Inclusion/exclusion criteria

Articles would be included for analysis when they met the following criteria: (1) Articles must have been published within conference proceedings or journals. Articles without details of research designs and results were excluded; (2) Articles should focus on the success of medical crowdfunding and/or included other factors related to the success of crowdfunding (e.g., narrative strategies and ethical factors of medical crowdfunding); (3) Articles must be written in English and published between 2010 and 2020 because medical crowdfunding emerged in the post-2008. Articles which do not meet above criteria were excluded.

Quality assessment

To ensure the quality of the articles, they were all rated for quality. The McGill Mixed Methods Appraisal Tool (MMAT -Version 2018), designed for complex systematic reviews and suitable for the quality assessment of qualitative, quantitative, or mixed methods, was used to perform the quality rating [23]. Since published in 2009, the MMAT has verified its internal reliability, usability, and content validity in several studies. It would judge articles from category of study designs (qualitative research, quantitative research, mixed method research) and methodological (such as randomized controlled, non-randomized and descriptive studies) quality criteria with a series of items. Taking quantitative descriptive studies for example, the items included: (1) Is the sampling strategy relevant to address the quantitative research question? (2) Is the sample representative of the population understudy? (3) Are measurements appropriate? (4) Is there an acceptable response rate? For studies selected for a systematic review, the methodological quality can then be evaluated using the above four criteria. Since the full mark of quality evaluation is 100% (meeting all four criteria), we refer to previous studies and use the evaluation level of 75% (meeting at least three criteria) [24]. Low-quality articles (75% or less based on MMAT ratings) were excluded.
Data analysis

The metadata of the articles was extracted and listed in Microsoft Excel including the author region, publication date, data sources, research questions, data collection settings, methods the results, discussions, conclusions and bibliographies. The details of search results and in different stages are presented in following section. To interpret our findings, all the authors discussed how to present our findings systematically. Since the conception of medical crowdfunding is dynamic, we discuss the conception at first. Then we summarize the bibliographic and study information of all included articles. Besides the summary of articles information, we tried to categorize the success factors according to the contextual structures of medical crowdfunding. Since there are three main actors which include platforms, raisers, and donors in medical crowdfunding and they interact with each other based on specific campaigns [25], we could categorize the success factors into four categories: platforms, raisers, donors and campaigns. Because of the heterogeneity of outcome measures adopted in our included studies, it was impracticable to conduct a meta-analysis. Therefore, findings were qualitatively grouped by the four categories.

Results

Search results

According to PRISMA, we document the result of review process in this section. A total of 441 articles were identified from the five databases. After removing duplicate articles, a total of 395 related articles were screened out. Titles and abstracts were screened by two authors separately; however, when a different opinion was given, a third author would be involved to mediate the discussion and reach an agreement. After screening and based on the inclusion/exclusion criteria, a total of 27 potentially relevant articles were chosen for full-text review. In the full-text review, we excluded the articles which do not discuss or examine specific success factors of medical
crowdfunding campaigns. After full-text review was performed, 19 papers were selected for more in-depth analysis. Finally, after all the stages of quality assessment, 13 articles were chosen for this review. The whole process is shown in Figure 1.

The conceptions of medical crowdfunding

The literature indicated that, despite the acknowledgment of the benefit of medical crowdfunding in strengthening healthcare, there is still a lack of consensus on the conception of crowdfunding campaigns in healthcare. However, to study the success factors of medical crowdfunding, we need to have a basic understanding of medical crowdfunding. Based on previous studies, we define the scope of medical crowdfunding as crowdfunding for medical expenses in hospitals, new drugs in scientific research institutions, and new treatments (e.g., hospitalization expenses, scientific research funds).
Description of the studies

Table 2 summarizes the features and discoveries for each of the 13 studies included. 9 out of the 13 studies relied entirely on crowdfunding websites such as GoFundMe. There were four main analytical methods used: text analysis, regression analysis, semi-structured interviews, and exploratory spatial analysis. Of all the research methods, text analysis is the most used one, with 4 studies using only text analysis and two studies using text analysis partially. Of the 13 included studies, 6 studies are directly related to the success of medical crowdfunding, with the remaining 7 being indirectly related. The number of publications is steadily increasing over time, which indicates that this field is getting more and more attention from scholars and practitioners because of the particularity of medical crowdfunding. Most studies included in this review are from developed countries, with the largest source of articles being the United States from which almost half of the articles included in this review, followed by Canada.

Table 2. The Bibliographic and Study information of articles

| Author                | Time | Country            | Study aim                                                                 | Data sources                          | Method                                                 | Success factors                                                  |
|-----------------------|------|--------------------|---------------------------------------------------------------------------|---------------------------------------|--------------------------------------------------------|---------------------------------------------------------------|
| Durand et al. [12]    | 2018,4 | United States of America | To identify the factors influencing the success of crowdfunding campaigns | YouCaring                             | Text analysis, multiple linear analysis, logistic regression analysis | Campaign description length; Goal amount; Third-person description perspective; Cognitive state |
| Kim et al. [26]       | 2018,4 | United States of America | To investigate how beneficiaries present their situation and how contributors view the information presented. | GoFundMe, YouCaring, Fundly           | Semi-structured interviews                             | Authenticity                                                   |
| van Duynhoven et al. [27] | 2019,5 | Canada             | To explore the role of socioeconomic status in medical crowdfunding campaigns | Cancer-related activities published by Canadians; The 2016 Census Profile for aggregate dissemination area and area boundaries; forward sortation area boundaries | Exploratory spatial analysis                           | Socioeconomic status/Demographic                              |
| Xu and Wang [28]      | 2019,8 | China              | Make clear the narrative strategy of medical crowdfunding article          | Easy Fundraising                      | Thematic narrative analysis                           | Narrative strategies                                          |
| Author               | Time   | Country          | Study aim                                                                                           | Data sources          | Method                          | Success factors                                                                 |
|---------------------|--------|------------------|----------------------------------------------------------------------------------------------------|-----------------------|---------------------------------|---------------------------------------------------------------------------------|
| Hou et al. [29]     | 2016,5 | United States of America | To assess the credibility of online medical crowdfunding campaigns                                 | (1) Comment on Reddit related to the medical crowdfunding campaign, (2) 20 participants | Text analysis and semi-structured interviews                                   | Credibility, Individual prestige                                                 |
| Aleksina et al. [30]| 2019,7 | France           | To investigate the determinants of successful crowdfunding campaigns in medical research.         | Consano, Experiment   | Least square method (OLS) regression | Number of Tweeters; Goal amount; Platform availability; Total campaign number; Total fundraising amount; Total donor number |
| Holmes et al. [31]  | 2019,2 | United Kingdom   | To determine whether crowdfunding of pharmacy-related products through popular online platforms. | Kickstarter, Indiegogo| Text analysis                    | Media attention; Platform audit; Demographic information of donors              |
| Snyder et al. [32]  | 2017,1 | Canada           | To explore how Canadians can demonstrate to others that they should fund their health needs      | FundRazz, Generosity, GoFundMe, YouCaring          | Text analysis                    | Personal connections; Depth of need; Giving back; Ethic                          |
| Koole et al. [33]   | 2018,10| Netherlands      | Identify key factors for the success of crowdfunding for GUCH patients                           | An online donation platform | Text analysis                    | Professional organization support; Stakeholder support; Easy-to-understand message |
| Barcelos and Budge [34]| 2019,1| United States of America | Investigated how transgender communities utilize crowdfunding expenses related to gender affirming medical care | GoFundMe               | Hierarchical multiple regression analyses | Social media (Facebook) sharing; Demographic information of Raiser (Age, location, race, identity) |
| Berliner et al. [4] | 2017,2 | United States of America | Explore the usage, impacts, or consequences of the increasing reliance on crowdfunding for health | GoFundMe               | Textual analysis                  | Medical literacy; Media literacy                                                 |
| Bassani et al. [8]  | 2019,8 | Italy            | Examine the worldwide population of healthcare crowdfunding platforms and explore the relationship between healthcare crowdfunding success and national health systems | 76 crowdfunding platforms that host healthcare campaigns | Negative binomial regressions                      | Platform type; Social return                                                |
| Kenworthy [35]      | 2018,11| Norway           | Map and document how medical crowdfunding is shaped by, and shapes, health disparities           | An Ethnography of US medical crowdfunding; A study of global health crowdfunding; A project of US medical crowdfunding campaigns | Exploratory conceptual and empirical analysis                                      | Platform design (Search engine, lists, webpage, etc); Partnership with traditional media; Deservingness; Narratives |
Success factors of medical crowdfunding campaigns

Through the evaluation of the included articles, the factors affecting the success of medical crowdfunding campaigns can be summarized into four categories according to actors in the medical crowdfunding context: (a) platforms; (b) raisers; (c) donors; (d) campaigns. The influencing factors for the success of medical crowdfunding campaigns are discussed in detail with reference to the following four aspects.

Platforms

For platforms, the factors influencing the success of medical crowdfunding campaigns can be divided into two aspects: technical and social. The details of success factors related to platforms are summarized in Table 3.

The technical aspect of platforms reflects the functionality of medical crowdfunding platform in terms of platform audit, platform availability, platform types and platform design. Platform audit is reviewing the campaigns by platforms and could impact donor’s decision on donation. The review of the campaigns by crowdfunding platforms is closely related to the eventual success of the crowdfunding campaigns [2]. Besides, platform availability is the degree to which medical crowdfunding platform is available to their users. The availability of the platform will positively affect the donor's incentive, and thus the project funding results [35]. In addition, the types of platform could also have impacts on fundraising. Platforms with more extensive publicity are more popular than specialized, smaller platforms [8]. Finally, the design of the platform would decide donors’ experience of using the medical crowdfunding, then their supportive behaviors and word of mouth behaviors which would help fundraisers attract the attention of potential donors [35].
The social aspect of crowdfunding platforms reflects the social interaction inside and outside the platforms in terms of total campaign number, total fundraising amount, total donor number and total and partnership with traditional media. The more categories and campaigns the platform contain, the more potential donors it attracts, and then the greater the probability of receiving donations will be [36]. Meanwhile, if the total amount of fundraising on the platform is higher, fundraisers who publish campaigns on the platform would have more confidence to raise money they want [30]. Moreover, the total number of donors can represent the amount which could be raised to some extent [37]. The number of registered institutions in the platform also reflects the platform's position within the industry and accessible resources for campaigns in the platform [3]. Finally, the partnership with traditional media would make the campaigns have opportunities to access mass media and their audiences, then increase the number of potential donors. More interactions could help build more social capital and have higher fundraising possibilities [38]. The larger potential donor base is, the higher possibility of accomplishing the target amount of campaigns is [9].

Table 3 Factors influencing the success of medical crowdfunding campaigns from the platforms

| Category   | Dimensions | Factors          | Definitions                                                                 | Functions                                                                                                                                                                                                 | Sources            |
|------------|------------|------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| Platforms  | Technical  | Platform audit   | Review of campaigns on crowdfunding platforms.                              | The review of campaigns by crowdfunding platforms would affect donor’s decision.                                                                                                                         | Holmes et al. [31] |
|            |            | Platform availability | The degree to which the platform is available to users. | The availability of the platform would affect donor incentives and thus campaign funding results.                                                                                                           | Aleksina et al. [30] |
|            |            | Platform types    | Whether the platform is specialized or general.                               | Platforms with more extensive publicity are more popular than specialized, smaller platforms.                                                                                                           | Bassani et al. [8] |
|            |            | Platform design   | The design elements of the platform including search engine, lists, webpage, etc. | Platform design would determine donors’ experience, then their donation behavior.                                                                                                                                 | Kenworthy [35]     |
### Raisers

The influencing factors from raisers can be analyzed in terms of three aspects: demographic, individual characteristics, and social. The details of success factors related to raisers are summarized in Table 4. It should be noted that the raisers refer to the beneficiary.

The demographic characteristics of the raisers include age, nationality, and geographical locations, etc. It is shown that younger individuals were more likely to succeed in health crowdfunding [34]. Meanwhile, the geographical locations of raisers are also an important factor affecting the success rate of campaigns. Raisers in remote areas are less successful in raising money, while raisers in affluent areas where there are more social resources are more likely to succeed in raising money [36]. Moreover, raisers with higher education level and higher income are shown to be more likely to attract the attention of potential donors and thus get donations [27].

As to individual characteristics, prior literature has showed that the campaigners of successful crowdfunding campaigns had better media literacy and medical literacy [4]. Raisers with high media
literacy are more likely to spread their message across social media platforms and attract potential donors. Raisers with higher medical literacy are more likely to deliver accurate disease-related and healthcare information [4]. In addition, once raisers are perceived to be deservingness to be donated, their campaigns would attract many donors and succeed in raising funds [35].

Social factors related to raisers contain personal connections, stakeholder support, professional organization support and individual prestige. Raisers’ personal connections establish social networks and could share links of medical crowdfunding campaigns in their social networks, which allowed more potential donors to see the information of the campaigns, thus obtaining more funds. Meanwhile, gaining the support of stakeholders and professional organizations makes it easier to successfully raise funds for medical crowdfunding campaigns [33]. Finally, if raisers have high individual prestige, they are more likely to gain trust and support from donors in social networks [32].

Table 4 Factors influencing the success of medical crowdfunding campaigns from the raisers

| Category | Dimension | Factors          | Definitions                                                                 | Functions                                                                                     | Sources                           |
|----------|-----------|------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------|
| Raisers  | Demographic | Age             | Raisers’ demographic information include age, education level, income, geographical location. | Younger people are more likely to succeed in health crowdfunding.                                | Aleksina et al. [30]              |
|          |           | Education level |                                                                                | The raisers with higher education level and income are more likely to attract the attention of donors and obtain higher donation possibility. | Barcelos and Budge [34]          |
|          |           | Income          |                                                                                |                                                                                               | van Duynhoven et al. [27]        |
|          |           | Geographical location |                                                                                | Raisers are more likely to get help from people in or near their districts, especially in wealthier places. | Barcelos and Budge [34]          |
| Individual characteristics | Media literacy | Raisers’ ability to make use of different media. | The raisers of successful crowdfunding campaigns have good media literacy. | Berliner and Kenworthy [4] Holmes et al. [31] |
|----------------------------|---------------|--------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------|
| Medical literacy           | Raisers’ ability of leverage different medical knowledge. | Raisers with a certain level of medical literacy facilitates the proper description of the disease and the relevant understanding of the health care system. | Berliner et al. [4] |
| Deservingness              | The degree to which raisers are thought to be deserved to get donation. | Once raisers are perceived to be deservingness to be donated, their campaigns would attract many donors and succeed in raising funds | Kenworthy [35] |
| Personal connections       | Raisers’ personal connections with others including their families, friends and colleagues, etc. | The scale of raisers’ personal connections has a positive effect on the success rate of fundraising. | Snyder et al. [32] |
| Stakeholder support/Professional organization support | Raisers get support from different stakeholders and professional organizations. | The support from stakeholders and professional organizations makes fundraising easier. | Koole et al. [33] |
| Individual prestige        | Raisers’ personal respects and admiration from others inside and outside the platform. | The prestige of raisers could serve as the signal of the credibility and success of their campaigns. | Kim et al. [29] Snyder et al. [32] |
Donors

The determinants of the donors’ intention to donate can be mainly divided into the demographic and individual characteristics. The details of success factors related to donors are summarized in Table 5.

Prior literature has examined the effect of demographics of donors and found that donors’ gender [39,40], age [31], education level [31], income [31] and geographical location [30] had significant effects on donation behavior. Younger donors have more willingness to donate [34]. Besides, other studies also indicated that people with higher education and income level were more likely to donate [41]. Meanwhile, donors were more willing to contribute to crowdfunding campaigns in or near their own regions in medical crowdfunding platforms [30]. Therefore, there exists geographic inequity which are compounded by the social, technological, cultural issues. [4].

Individual characteristics studied include cognitive state and social returns. Cognitive state is donors’ state invoked by reading campaigns’ description [12]. If donors may feel threatened by reading the negative campaign descriptions, they would hesitate to donate. While when donors aware the importance and urgency of the raiser's medical crowdfunding campaigns, they would have high willingness to donate [42]. Besides, the social return is a major intrinsic motivation for individuals or groups to donate to medical crowdfunding campaigns [4]. Relevant studies have demonstrated that people with prosocial values, participate more in charitable activities, and donate more willingly [43]. Donors with this intrinsic motivation would have high willingness to donate.

Table 5 Factors influencing the success of medical crowdfunding campaigns from donors

| Category | Dimensions | Factors | Definitions | Functions | Sources |
|----------|------------|---------|-------------|-----------|---------|
| Donors   | Demographic| Age     | Raisers’ demographic information include age, education level, income, geographical | Donors with younger age, higher education and income level would have higher willingness to donate. | Holmes et al. [31] |
| Individual characteristics | Geographical location | Cognitive state | Social returns |
|-----------------------------|-----------------------|-----------------|----------------|
| Donors are more willing to contribute to crowdfunding campaigns in or near their own regions. | Donors may feel threatened by negative campaign descriptions and social pressure to donate. The positive cognitive state invoked by the campaign description would promote donors’ donation behavior. | The more returns to the society from the donation, the more possibility donors would donate. |

### Campaigns

For campaigns, the success factors can be divided into two aspects: the format and the content. The details of success factors related to donors are summarized in Table 6.

As to format, related factors of medical crowdfunding campaigns include goal amount, campaign description length, third-person description and social media sharing. Towards goal amount, studies have found that when a campaign was close to its fundraising goal, it would stimulate donors’ donation behavior and increase the possibility of project success [39,44]. Meanwhile, longer campaign description length and higher goal amount were significantly associated with amount raised [12]. In addition, third-person description perspective can convey a patient’s positive qualities which would be not acceptable in the first person perspective due to the testimonial effect [12]. Finally, it is critical for successful crowdfunding campaigns to leverage social
The amount raised was strongly correlated with updates and shares in social media [12]. One additional tweet or retweet with more personal comments could enhance the probability of success of crowdfunding campaigns [30].

Regarding content aspect, success factors about campaigns contain the narrative strategy, authenticity, credibility, easy-to-understand message, giving back, and depth of need. Illness narrative represents the personal story and illness experience that patients are sharing verbally or in writing [28]. The narration style is found that not only affected the efficiency of the dissemination of health information, but also impacted heavily on the campaigners' cognitions, attitudes, and behaviors [28]. Authenticity which could be conveyed by pictures of raisers who depicts their medical conditions would increase the possibility of donation behaviors. Meanwhile, it has been shown that funding would be more accessible when the presented narratives of campaigns were credible [45]. To demonstrate the credibility of campaigns, many methods could be used including collective endorsements, presenting details of external financial support, displaying off-site verification details (of ailment, incident, & treatment), fundraiser and beneficiary identity verification, and using a popular and trusted platform within a large scale [29].

Besides, easy-to-understand information in the campaign description gives potential donors who read the information a clear picture of the campaign [33]. In addition, portraying the beneficiary as someone who selflessly gives back to society will not only help establish the positive image of raisers, but also inspire the donors themselves [32]. Finally, it has shown that a patient who is in urgent need of funds because of disease or treatment will help to obtain donations from potential donors [32].

Table 6 Factors influencing the success of medical crowdfunding campaigns from campaigns

| Category | Dimension | Factors     | Definitions                                                                 | Functions                                          | Sources                                |
|----------|-----------|-------------|-----------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------|
| Campaign | Format    | Goal amount | The objective amount of money the campaign plan to raise.                    | Goal amount has a positive impact on campaign success. | Durand et al. [12] Alekksina et al. [30] |
| Content                              | Description                                                                 | Impact                                                                 | Reference                          |
|-------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------|
| **Campaign description length**    | The length of the medical crowdfunding campaign description.                 | Campaign description length has a positive impact on campaign success | Durand et al. [12]                 |
| **Third-person description perspective** | The narrative perspective of the campaign is the third person.              | The third person perspective makes the story more objective and realistic, which makes it more convincing. | Durand et al. [12]                 |
| **Social media sharing**            | The number of shares and likes of campaigns in social media which connect to the platform. | The more shares and likes potential donors see, the more likely they are to donate. | Barcelos and Budge [34]            |
| **Content**                         | **Narrative strategy**                                                      | Narrative strategies such as more positive emotions, more information, and appropriate arousal level have impacts on crowdfunding success. | Durand et al. [12] Koole et al. [33] Kenworthy [35] |
| **Authenticity**                    | The content of medical crowdfunding campaigns is authentic.                 | Potential donors payed attention on their impression of raisers’ authentic medical conditions and make their decisions based on it. | Kim et al. [26]                    |
| **Credibility**                     | Credibility of medical crowdfunding campaigns.                              | Credibility of campaigns which could be formed based collective endorsement have impacts on the success of medical crowdfunding campaigns. | van Duynhoven et al. [27] Kim et al. [29] Koole et al. [33] |
| **Easy-to-understand message**     | The degree to which the message is easily understood.                       | Easy-to-understand information helps potential donors get a sense of the raisers’ intention, which in turn helps donors make decisions. | Koole et al. [33]                  |
|                  | Giving back                                                                 | Portraying the raisers as someone who selflessly gives back to society. | The past efforts of the raisers on behalf of others were used as a rationale for the potential donors to contribute to the crowdfunding campaign. | Snyder et al. [32] |
|------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-------------------|
| Deep of need     | Campaign content reflects the urgent need of funds to solve health problems. | The urgency of need for help would determine the success of raising money.       |                                                                                                                | Snyder et al. [32] |

**Discussion**

**Principle findings**

By investigating 13 studies included, the key factors of successful medical crowdfunding campaigns were extracted. On this basis, we conducted a more in-depth review and provide a comprehensive understanding of the factors that influence successful campaigns. We find the success factors of medical crowdfunding campaigns could be divided into four categories: platforms, raisers, donors and campaigns based on included 13 studies. The success factors involve the main actors in the whole medical crowdfunding campaigns. Towards the four factor categories, we find campaign factors are more frequently studied than other factors. At the same time, the platform factors also play an important role in medical crowdfunding than other factors [46]. This implies that platforms are important in linking donors and raisers [47]. In addition, among the four categories of success factors of medical crowdfunding, there are relatively few studies related to donors and future studies could pay more attention to this area. Despite the widespread use of medical crowdfunding, to the best of our knowledge, this is the first systematic review that examines the factors that lead to successful medical crowdfunding campaigns. This review provides a summary of the conception of medical crowdfunding and successful factors of campaigns.
Implications

Our review reveals the research trends of the success of medical crowdfunding campaigns. According to our review, more studies with more diverse methods and theoretical backgrounds about the success of medical crowdfunding campaigns would be published. The proposed categories of literatures provide a useful framework to understand the success of medical crowdfunding campaigns. The four categories: platforms, raisers, donors, campaigns could be the four research perspectives to understand the success of medical crowdfunding campaigns. However, several research opportunities are uncovered by our systematical review. For example, interactive effects of the four categories could be an opportunity to better understand the success of medical crowdfunding campaigns.

The four categories of successful factors that are actors in medical crowdfunding can interact with each other [7,48,49]. First, raisers register in the platforms to initiate campaigns to raise money for medical expenses with illness narratives, which include fundraising goals, fundraising time and fundraising events, etc. Secondly, the medical crowdfunding platforms do a preliminary review and then release those campaigns to the platforms. Third, managers of the platforms give the fund raised from the public to the campaigners after the relevant processing charges are collected. Finally, a crowdfunding campaign is a success after all the above processes are successfully implemented.

In addition, our study also provides some empirical implications. First, theoretical perspectives could be applied or built for understanding the success factors of medical crowdfunding. Few of included articles take strong theoretical perspective to help analyze, explain and predict the success factors of medical crowdfunding and convey few theoretical implications. Therefore, it is necessary to apply more theories to better understand this topic. Second, more methods or mixed methods could be employed to investigate this topic. Although text analysis dominates current included articles, more insights could be explored by applied other methods or mixed methods which possess...
different advantages to study the success factors of medical crowdfunding campaigns. Third, data could be collected from multi-sources. In current literature, data was collected from single sources which may make method suffer from inherent biases. Therefore, collecting data from multi-sources could provide multiple validation to our research models and methods.

**Limitations and future directions**

Our study also has some limitations. First, no new factors and relationships about medical crowdfunding could be explored through our systematic review. This should be the most significant inherent limitation of our study. Since our systematic review rely literatures published before, all factors and relationships which are identified in this review are from previous literature. Second, more literatures could be included in our systematic review. Besides the literatures written in English language from five databases, literatures written in other languages from other databases may also discussed the success factors of medical crowdfunding. Third, bias may still exist in the process of selection and evaluation of literature. Although we have taken actions to minimize the bias from the differences of literature reviewers such as solving conflicted judgment by discussing among reviewers, the bias could not be excluded totally. Therefore, future research could take more actions to reduce the possible effect of biases. Fourth, the heterogeneity exists in the documentation. Since literatures included in our review contain information from different sources about medical crowdfunding, quality of our review results may be impacted. Future research could ensure the quality by developing some guidelines of documentation. At last, other categories of success factors of medical crowdfunding campaigns could be considered. Besides the four categories of success factors discussed in our review, other categories of factors like health systems or national economic status could be considered.
Conclusion

This review explores the factors involved in successful medical crowdfunding campaigns by examining four categories: (a) platforms; (b) raisers; (c) donors; (d) campaigns. This review has contributed to the literature on medical crowdfunding by summarizing successful factors of medical crowdfunding systematically. This review could be the basis for both future research and medical crowdfunding campaigns. With the development of medical crowdfunding, more studies about different factors within and without the four categories are expected in the future.

Reference

1. Young MJ, Scheinberg E. The Rise of Crowdfunding for Medical Care: Promises and Perils. JAMA 2017 Apr 25;317(16):1623–1624. [doi: 10.1001/jama.2017.3078] PMID: 28334321.
2. Zenone M, Snyder J. Fraud in Medical Crowdfunding: A Typology of Publicized Cases and Policy Recommendations. Policy & Internet 2019 Jun;11(2):215–234. [doi: 10/gfrmj9]
3. Snyder J. Crowdfunding FOR MEDICAL CARE: Ethical Issues in an Emerging Health Care Funding Practice. Hastings Center Report 2016 Nov;46(6):36–42. [doi: 10/gf3k53] PMID: 27875643.
4. Berliner LS, Kenworthy NJ. Producing a worthy illness: Personal crowdfunding amidst financial crisis. Social Science & Medicine 2017 Aug;187:233–242. [doi: 10/gbs7jn] PMID: 28274601.
5. Snyder J, Zenone M, Crooks V, Schuurman N. What Medical Crowdfunding Campaigns Can Tell Us About Local Health System Gaps and Deficiencies: Exploratory Analysis of British Columbia, Canada. Journal of Medical Internet Research 2020 May 22;22(5):e16982. [doi: 10.2196/16982] PMID: 32348269.
6. Lublóy Á. Medical crowdfunding in a healthcare system with universal coverage: an exploratory study. BMC Public Health 2020;20(1):1672. [doi: 10.1186/s12889-020-09693-3] PMID: 33167927.
7. Ren J, Raghupathi V, Raghupathi W. Understanding the Dimensions of Medical Crowdfunding: A Visual Analytics Approach. Journal of Medical Internet Research 2020 Jul 3;22(7):e18813. [doi: 10.2196/18813] PMID: 32618573.
8. Bassani G, Marinelli N, Vismara S. Crowdfunding in healthcare. J Technol Transf 2019 Aug 1;44(4):1290–1310. [doi: 10.1007/s10961-018-9663-7]
9. Renwick MJ, Mossialos E. Crowdfunding our health: Economic risks and benefits. Soc Sci Med 2017;191:48–56. PMID:28889030
10. Burtch G, Chan J. Investigating the Relationship Between Medical Crowdfunding and Personal Bankruptcy in the United States: Evidence of a Digital Divide. MIS Quarterly 2019 Mar;43(1):237-+. [doi: 10.25300/MISQ/2019/14569]

11. Jin P. Medical crowdfunding in China: empirics and ethics. J Med Ethics 2019 Aug;45(8):538–544. [doi: 10/ggkw5r] PMID: 31217228

12. Durand WM, Peters JL, Eltoraie AEM, Kalagara S, Osband AJ, Daniels AH. Medical crowdfunding for organ transplantation. Clin Transplant 2018 Jun;32(6):e13267. [doi: 10/ggkw5w] PMID: 29683220.

13. Sisler J. Crowdfunding for medical expenses. CMAJ 2012 Feb 7;184(2):E123-124. PMID:22231688

14. Pol SJ, Snyder J, Anthony SJ. “Tremendous financial burden”: Crowdfunding for organ transplantation costs in Canada. PLOS ONE Public Library of Science; 2019 Dec 20;14(12):e0226686. [doi: 10.1371/journal.pone.0226686] PMID: 31860656

15. Dressler G, Kelly SA. Ethical implications of medical crowdfunding: the case of Charlie Gard. J Med Ethics 2018 Jul;44(7):453–457. [doi: 10/gdhwq3] PMID: 29728452

16. Simon R. Crowdfunding Sites Like GoFundMe and YouCaring Raise Money—and Concerns. Wall Street Journal [Internet] 2016 Mar 1 [cited 2020 Dec 22]; Available from: https://www.wsj.com/articles/crowdfunding-sites-like-gofundme-and-youcaring-raise-moneyand-concerns-1456775949

17. Robinson L, Cotten SR, Ono H, Quan-Haase A, Mesch G, Chen W, Schulz J, Hale TM, Stern MJ. Digital inequalities and why they matter. Information, Communication & Society Routledge; 2015;18(5):569–582. [doi: 10.1080/1369118X.2015.1012532]

18. Siering M, Koch J-A, Deokar AV. Detecting Fraudulent Behavior on Crowdfunding Platforms: The Role of Linguistic and Content-Based Cues in Static and Dynamic Contexts [Internet]. Rochester, NY: Social Science Research Network; 2016 May. Report No.: ID 2866922. Available from: https://papers.ssrn.com/abstract=2866922

19. Snyder J, Cohen IG. Medical Crowdfunding for Unproven Medical Treatments: Should Gofundme Become a Gatekeeper? Hastings Cent Rep 2019 Nov;49(6):32–38. PMID:31813183

20. Kenworthy N, Dong Z, Montgomery A, Fuller E, Berliner L. A cross-sectional study of social inequities in medical crowdfunding campaigns in the United States. PLOS ONE Public Library of Science; 2020 Mar 5;15(3):e0229760. [doi: 10.1371/journal.pone.0229760] PMID: 32134984.

21. Tawfik GM, Dila KAS, Mohamed MYF, Tam DNH, Kien ND, Ahmed AM, Huy NT. A step by step guide for conducting a systematic review and meta-analysis with simulation data. Tropical Medicine and Health 2019 Aug 1;47(1):46. [doi: 10.1186/s41182-019-0165-6] PMID: 31388330

22. Medicine and Books. BMJ 1995 Sep 16;311(7007):759. [doi: 10.1136/bmj.311.7007.759]

23. Hong QN, Fàbregues S, Bartlett G, Boardman F, Cargo M, Dagenais P, Gagnon M-P, Griffiths
24. Rush KL, Howlett L, Munro A, Burton L. Videoconference compared to telephone in healthcare delivery: A systematic review. International Journal of Medical Informatics 2018 Oct 1;118:44–53. [doi: 10.1016/j.ijmedinf.2018.07.007] PMID: 30153920.

25. Ren J, Raghupathi V, Raghupathi W. Understanding the Dimensions of Medical Crowdfunding: A Visual Analytics Approach. J Med Internet Res 2020 Jul 3;22(7):e18813. [doi: 10.2196/18813] PMID: 32618573.

26. Kim J G, Hong H, Karahalios K. Understanding identity presentation in medical crowdfunding[C]//Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems. 2018: 1-12. [doi: 10.1145/3173574.3173708]

27. van Duynhoven A, Lee A, Michel R, Snyder J, Crooks V, Chow-White P, Schuurman N. Spatially exploring the intersection of socioeconomic status and Canadian cancer-related medical crowdfunding campaigns. BMJ Open 2019 Jun;9(6): e026365. [doi: 10/ggkw5z] PMID: 31227531.

28. Xu K, Wang X. “Kindhearted People, Please Save My Family”: Narrative Strategies for New Media Medical Crowdfunding. Health Communication 2019 Aug 28;1–9. [doi: 10/ggkw54] PMID: 31455114

29. Kim JG, Kong HK, Karahalios K, Fu W-T, Hong H. The Power of Collective Endorsements: Credibility Factors in Medical Crowdfunding Campaigns. 34th Annual Chi Conference on Human Factors in Computing Systems, Chi 2016. New York: Assoc Computing Machinery; 2016. p. 4538–4549. [doi: 10.1145/2858036.2858289] ISBN:978-1-4503-3362-7

30. Aleksina A, Akulenka S, Lublóy Á. Success factors of crowdfunding campaigns in medical research: perceptions and reality. Drug Discovery Today 2019 Jul 1;24(7):1413–1420. [doi: 10.1016/j.drudis.2019.05.012] PMID: 31132416

31. Holmes TM, Aungst TD, Smith CC, Metcalf MD. Crowdfunding pharmacy- and medication-related products: How successful is it? J Am Pharm Assoc (2003) 2019 Apr;59(2S): S57–S62. PMID:30772207

32. Snyder J, Crooks VA, Mathers A, Chow-White P. Appealing to the crowd: ethical justifications in Canadian medical crowdfunding campaigns. J Med Ethics 2017 Jun;43(6):364–367. [doi: 10/f9pcvf] PMID: 28137998.

33. Koole MAC, Kauw D, Winter MM, Schuuring MJ. A successful crowdfunding project for eHealth research on grown-up congenital heart disease patients. Int J Cardiol 2018 Dec 15;273:96–99. PMID:30297187

34. Barcelos CA, Budge SL. Inequalities in Crowdfunding for Transgender Health Care. Transgender health 2019;4(1):81–88. [doi: 10.1089/trgh.2018.0044] PMID: 31032423.

35. Kenworthy NJ. Crowdfunding and global health disparities: an exploratory conceptual and empirical analysis. Globalization and Health 2019 Nov 28;15(1): 1-13. [doi: 10.1186/s12992-
36. Burtch G, Ghose A, Wattal S. Cultural Differences and Geography as Determinants of Online Prosocial Lending. Mis Quarterly 2014 Sep;38(3):773–794. [doi: 10.25300/MISQ/2014/38.3.07]

37. Belleflamme P, Lambert T, Schwienbacher A. Crowdfunding: Tapping the right crowd. Journal of Business Venturing 2014 Sep 1;29(5):585–609. [doi: 10.1016/j.jbusvent.2013.07.003]

38. Glesasure R, Feller J. Does Heart or Head Rule Donor Behaviors in Charitable Crowdfunding Markets? International Journal of Electronic Commerce 2016 Oct;20(4):499–524. [doi: 10/ggkw5x]

39. Ortiz RA, Witte S, Gouw A, Sanfilippo A, Tsai R, Fumagalli D, Yu C, Lant K, Lipitz N, Shepphird J, Alvina FB, Lin JC-H. Engaging a Community for Rare Genetic Disease: Best Practices and Education From Individual Crowdfunding Campaigns (vol 7, e3, 2018). Interact J Med Res Inc; 2018 Jun;7(1):e10707. [doi: 10.2196/10707] PMID: 30578239.

40. Su H, Chou T, Osborne PG. When Financial Information Meets Religion: Charitable-Giving Behavior in Taiwan. Social Behavior and Personality: an international journal 2011;39(8):1009–1019. [doi: 10.2224/sbp.2011.39.8.1009]

41. Dunn P. Professional corporate donation programs in Canada: An exploratory study. Nonprofit Volunt Sect Q 2004 Jun;33(2):334–345. [doi: 10.1177/0899764004263422]

42. Bekkers R, Wiepking P. A Literature Review of Empirical Studies of Philanthropy: Eight Mechanisms That Drive Charitable Giving. Nonprofit and Voluntary Sector Quarterly 2010 Sep 10 [cited 2020 Jul 31]; [doi: 10.1177/0899764010380927]

43. Van Lange PAM, Bekkers R, Schuyt TNM, Van Vugt M. From games to giving: Social value orientation predicts donations to noble causes. Basic Appl Soc Psychol 2007 Nov;29(4):375–384. [doi: 10.1080/01973530701665223]

44. Mollick E. The dynamics of crowdfunding: An exploratory study. J Bus Ventur 2014 Jan;29(1):1–16. [doi: 10.1016/j.jbusvent.2013.06.005]

45. Herzenstein M, Sonenshein S, Dholakia UM. Tell Me a Good Story and I May Lend You My Money: The Role of Narratives in Peer-to-Peer Lending Decisions. Journal of Marketing Research 2011 [cited 2020 Feb 16]; [doi: 10/ggkw58]

46. Zhang X, Hu W, Xiao Q. Influences of Medical Crowdfunding Website Design Features on Trust and Intention to Donate: Controlled Laboratory Experiment. Journal of Medical Internet Research 2021 May 4;23(5):e25554. [doi: 10.2196/25554] PMID: 33944787

47. Huang Z, Ouyang J, Huang X, Yang Y, Lin L. Explaining Donation Behavior in Medical Crowdfunding in Social Media. SAGE Open 2021;11(2):21582440211014520. [doi: 10.1177/21582440211014520]

48. Swan M. Crowdsourced Health Research Studies: An Important Emerging Complement to Clinical Trials in the Public Health Research Ecosystem. Journal of Medical Internet Research 2012 Mar 7;14(2):e1988. [doi: 10.2196/jmir.1988]
49. Lee D, Park J. The relationship between a charity crowdfunding project’s contents and donors’ participation: An empirical study with deep learning methodologies. Computers in Human Behavior 2020;106. [doi: 10.1016/j.chb.2020.106261]
Supplementary Files

Untitled.
URL: http://asset.jmir.pub/assets/98409a2709ee11589d48a58f0dbdc177b.docx

Untitled.
URL: http://asset.jmir.pub/assets/640ae4289eb19c24bf0d0516e43378f.docx
Figures
Summary of literature search and study selection process.