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Journal Pre-proof

Patient crowdsourcing of dermatologic consults on a Reddit social media community

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1 **Patient crowdsourcing of dermatologic consults on a Reddit social media community**

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28 Patient crowdsourcing of dermatologic consults on a Reddit social media community

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31 Despite patient interest in online consultations, prior to COVID-19, insufficient
32 reimbursement and infrastructure have prevented widespread adoption of telemedicine.^{1,2} In
33 turn, patients are turning to social media to seek diagnoses (*crowd-diagnosis*).³ The content of
34 these crowdsourced opinions, specifically in dermatology, has not been studied. We sought to
35 observe dermatologic consultation requests and responses on Reddit.

36

37 Reddit, the sixth-most popular US website with >430 million active users,⁴ hosts a large
38 forum (r/Dermatology) of >20,000 subscribers for medically-focused dermatologic discussions.*
39 Larger forums exist but focus on cosmetics. Unlike other social media, Reddit is favorable for
40 crowd-diagnosis because of anonymity and lack of character limit. We collected all posts (text
41 and images) on r/Dermatology from its inception (August 2011) through 2019 using Pushshift.io.
42 We randomly selected 160 posts per year from 2016 to 2019 (640 total posts) for qualitative
43 content analysis. Authors BC and RF developed a codebook to identify post and comment
44 attributes (**Table 1**). Each independently reviewed 320 conversations with 50 overlapping for
45 inter-rater reliability calculation.

46 34,153 posts were posted during the study period, growing from 387 in 2012 to 3,045 in
47 2016, 5,079 in 2017, 7,518 in 2018, and 13,152 in 2019.

48

49 After excluding deleted/promotional posts from the random 640 post sample, 427
50 remained. Excluding deleted accounts, 99% of posts were made by unique users. Most (84%)
51 posts requested crowd-diagnosis of dermatologic conditions, typically attaching clinical images.
52 Of posts requesting crowd-diagnosis, 15% sought second opinions, explicitly mentioning

53 previous healthcare visits. Fewer posts requested advice on treatment of existing conditions
54 (21%) or whether to seek in-person healthcare (4%).

55

56 Most (69%) posts received comment(s) (median, 3), including proposed diagnoses,
57 treatment advice, and advice on seeking healthcare. Of diagnosis-seeking posts with
58 comments, 3% received comments from self-described dermatologists and <1% from self-
59 described non-dermatologist physicians. No academic, governmental, or patient advocacy
60 groups offering advice were observed. Cohen's κ ranged from 0.73-1.0 for attributes indicating
61 high inter-rater agreement. Example posts illustrate motivations including access, wait times,
62 and discomfort with providers (**Table 2**).

63

64 Posts on r/Dermatology demonstrate patients seek information on crowd-diagnoses,
65 treatment, and referrals. The rapid growth suggests burgeoning demand for online medical
66 advice, which may include online medical consultations. Although investment in direct-to-
67 consumer teledermatology indicates industry interest, existing platforms mostly target
68 predetermined/uncomplicated conditions rather than the comprehensive care offered by
69 dermatologists in telemedicine and in-person visits.⁵ Examining how patients engage in online
70 consults may highlight services most sought in teledermatology.

71

72 While online communities offer accessibility, significant concerns remain. Many posts
73 sought second opinions, potentially indicating mistrust of providers. Anecdotally, misinformation
74 was present. Inaccurate advice from people without verifiable qualifications may result in
75 acceptance of misguided recommendations by both active and passive viewers. Analysis was
76 limited to one community on Reddit, which skews younger and male primarily from the US.
77 Future work should explore other online platforms.

78

79 Patients increasingly turn to social media for health information and crowd-diagnoses. In
80 response, physicians could partner with communities to enhance information exchange (e.g.
81 developing rigorous guidelines for requests), in order to forge sustainable online models of care.
82

83 *Since March 23, 2020, the moderators of r/Dermatology have converted the forum into one for
84 verified dermatology providers only. Requests for dermatologic consultations are referred to a
85 new forum, r/DermatologyQuestions.

86

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88 TABLES

89

90 Table 1. Qualitative attributes of the random sample of conversations on r/Dermatology and
91 associated frequencies. Attributes are not mutually exclusive.

92

Attributes (All posts)	% of all posts (n=427)
Requested a crowd-diagnosis of their dermatologic condition	84%
Included an image(s) of their skin	85%
Requested advice on treatment or management of an existing condition	21%
Requested a second opinion after having interacted with healthcare	16%
Requested dermatologic advice unrelated to diagnosis or treatment	11%
Requested advice on whether to seek professional healthcare of any kind	4%
Attributes (Posts seeking crowd-diagnosis)	% of posts requesting crowd-diagnosis (n=360)
Received comments from other users	69%
Received proposed diagnosis(es) from other users	58%
Received advice on treatment or management from other users	29%
Received advice to seek professional healthcare of any kind from other users	24%
Attributes (Posts seeking crowd-diagnosis that received comments)	% of posts seeking crowd-diagnosis that received comments (n=248)
Received comments from commenters self-described as dermatologists	3%
Received comments from commenters self-described as non-dermatologist physicians	<1%
Received comments from commenters who specifically self-described as not being physicians	12%

Received comments from commenters who did not self-describe their status as physicians	84%
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95 Table 2. Example posts and motivations for seeking health information on r/Dermatology. Posts
 96 were edited for anonymity and brevity. Posts may reflect more than one motivation.
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Example post	Plausible motivation of post
<i>Any idea what this spot is? I've been reading random websites for hours and don't know what's going on. I don't have insurance or a doctor either.</i>	Lack of access to health care
<i>The dermatologist prescribed several ointments for my rash, but one of them isn't covered by my insurance. Do I need to use it even though I'm using the other ones?</i>	Lack of insurance coverage for prescribed medications
<i>I have a bad smell from my penis and it's really itchy too, anything I can do for it? I'm too embarrassed to see a doctor.</i>	Discomfort discussing sensitive topics with physician
<i>I really don't want to visit a dermatologist for these bumps. Most of the doctors I've seen have been rude to me because I'm overweight.</i>	Discomfort with physicians' attitudes towards them
<i>I know I should trust my physicians, but I looked up skin cancer online and I'm really worried.</i>	Seeking a second opinion after having seen a physician
<i>I called a dermatologist to get this examined, but the next opening isn't for months, and it's with an NP not a physician.</i>	Unreasonable wait times

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