RECOMMENDATION ENDPOINTS AND SAFETY OF AN ONLINE SELF-TRIAGE FOR DEPRESSION SYMPTOMS

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DISCLOSURES

- We have no financial disclosures or conflicts of interest to disclose

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BACKGROUND

- Over the last few decades triage has become an increasing prevalent way to address patient concerns
- To help guide care, tools and protocols have been developed to address concerns and help those performing triage
- Early published example – UTI triage at Cleveland Clinic in the early 1990s

BACKGROUND

- Initially via phone calls, various formats have emerged these last few decades
- More recent iterations include online symptom checkers
    - However … Evidence is lacking…
        - Recent SRs suggest overall poor diagnostic accuracy

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OBJECTIVE

- We sought to assess recommendations following self-triage for depression and determine how often patients followed self-triage recommendations
- We also reviewed outcomes of emergency department (ED) visits, hospitalizations, and deaths in patients using our online self-triage tool for depression symptoms

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SELF TRIAGE DESCRIPTION

- Mayo Clinic Patients with a patient portal may access self-triage, available 24/7 via web or mobile app
  - The patient chooses the symptom they want triaged
  - The depression self-tirage tool uses branching logic (with up to 17 questions) to make mutually exclusive recommendations:
    - 1) home care, 2) call current provider, 3) schedule a visit, 4) call nurse triage or 5) seek care at an emergency department immediately

  - For “schedule an appointment” → link to a self-scheduling option
  - PHQ-9 and PHQ-9M can be administered
  - Nurse triage available 24/7

SELF TRIAGE DESCRIPTION

- Patients are asked to confirm they are triaging for themselves
- Self triage is denied if patient is attempting to triage someone other than themselves
- System allows only one self-triage use per day - any additional attempts on the same day are declined by the system

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METHODS

- We evaluated depression self-triage encounters by Mayo Clinic patients spanning sites in Minnesota, Iowa and Wisconsin that took place between December 2, 2021, and December 13, 2022
  - We captured both endpoint recommendations from the self-triage encounter as well as the occurrence of follow-up encounters that patients had within seven days of the self-triage encounter
  - Follow up encounters included nurse triage call, portal message, in person or video visit with PCP/psychiatry, eVisit, ED visit or hospitalization
  - We also electronically reviewed for deceased versus living status within 7 days of the self-triage date as well as at the time of data capture
  - Statistical analysis was performed using R with BlueSky Statistics Version 10.3.13 (BlueSky Statistics LLC, Chicago, IL, USA)
- IRB exempt

RESULTS

- 503 unique patient self-triage encounters using the depression self-triage algorithm
  - 190 denied → second self-triage attempt performed on the same day
  - Six denied → someone using the tool other than the patient
  - Twenty removed for not having research authorization
- 287 unique encounters from 263 unique patients that were eligible for our study
- Most patients used the depression self-triage algorithm only once during the study period
  - Eighteen patients used the algorithm multiple times (two to five times each)
- Our unit of study was the self-triage encounter rather than the individual patient

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RESULTS

Demographics	
	Overall (N=287)
Web versus mobile access of self-triaging tool	
Mobile	179 (62.4%)
Web	106 (36.9%)
Gender (female)	**208 (72.5%)**
Mean age in years (SD)	34.34 (15.46)
Age	
<18 years old	**33 (11.5%)**
18-39 years old	**172 (59.9%)**
40-59 years old	54 (18.8%)
60 years old or older	28 (9.8%)
During clinic hours (M-F 8 to 5)	**137 (47.7%)**

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RESULTS

Triage endpoint:	
Call Current Provider	1 (0.3%)
Call Nurse Triage	**247 (86.1%)**
Seek emergency medical care	**9 (3.1%)**
Home Care	4 (1.4%)
Schedule Visit	26 (9.1%)
Followed recommendations (yes)	**58 (20.2%)**
Any follow up in seven days (yes)	**176 (61.3%)**
In person follow up	116 (40.4%)
Non-face-to-face follow up	145 (50.5%)
Follow up encounter type#	
Hospitalization	6 (2.1%)
Emergency department	15 (5.2%)
Nurse triage call	44 (15.3%)
Portal message	120 (41.8%)
Video visit	29 (10.1%)
In person appointment	92(32.1%)
eVisit	2 (0.7%)

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RESULTS

- Nine patient encounters received an endpoint recommending to seek immediate emergency care
  - Six had no contact in our health care system within seven days
  - None died within seven days of self-triage nor were any reported as deceased at the time of data collection for our study
- Three patients with follow up encounters:
  - One had a suicide attempt and then self-presented to the ED three hours after self-triaging
    - This patient was ultimately hospitalized for psychiatric care
  - One called the nurse triage line the same day as their online triaging and was recommended to be seen in the ED but chose instead to see their primary care provider (PCP) the next day
  - One reached out via online messaging two days after their self-triage requesting an appointment and was seen seven days after their self-triage

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RESULTS

- There were 15 emergency department (ED) visits within seven days of the self-triage encounter
  - Nine of these ED visits were mood related while six ED visits were not related to mood, depression, or suicidality
- There were 6 hospitalizations within seven days of triage
  - One hospitalization was for diabetic ketoacidosis
  - One hospitalization was for a suicide attempt (as described above)
  - One hospitalization was for suicidal ideation (SI) with a plan
  - Two hospitalizations were for suicidal ideation without a plan
    - All three of the patients who were hospitalized with suicidal ideation had an endpoint to call nurse triage
  - The last hospitalization was an involuntary hold for new mania – this patient also had an endpoint to call nurse triage

RESULTS

- Overall, 61.3% had follow up within 7 days of self-triage
- Only 20.2% followed the specific recommendations given by the self-triage tool in the seven days after triaging
  - Of the patient encounters where endpoint recommendations were not followed, 121 (52.8%) still had some type of follow up within seven days of self-triaging
- Patients who followed the recommendations were, on average, older than those who did not
- Patients with the endpoint to call nurse triage or seek emergency care were less likely to follow endpoint recommendations
- There was no difference in gender, method of access (mobile or web), or during or after clinic hours with respect to following self-triaging recommendations
- No reported deaths within 1 week of self-triaging for depression (and up to 4 months after the study period end)

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DISCUSSION

- Most encounter endpoints recommended nurse triage
  - For these the self-triaging tool may not have added much to their care nor decreased health care team input
  - May still may have provided a convenient and easily accessible starting point for seeking care
  - Patients were slightly more likely to use this self-triaging tool outside of regular clinic hours
    - Availability may be helpful for patients who desire assistance outside of routine clinic hours

- Notably 10.8% of patients using the tool were triaged to endpoints (call current provider, schedule visit, home care) *that did not require* any urgent health care team input

- 9.1% were triaged to an endpoint to schedule a visit would have the ability to self-schedule a visit at the end of the self-triaging encounter without needing any health care team input
  - Though this endpoint was a minority, when scaled over time this has the potential to result in substantial offloading of nurse triage and scheduling specialists time

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DISCUSSION

- Only 20% followed the specific end point recommendations
- However, 60% had any follow up within seven days
  - This was more common among those who accessed the tool during clinic hours for unclear reasons
- A puzzling high percentage (38%) who attempted to use the depression self-triaging algorithm who were denied due to already performing a self-triaging encounter the same day
  - Due to study methodology we cannot determine if they had used the depression self-triage option earlier the same day or a different self-triage algorithm

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DISCUSSION

- Depression is potentially a high-risk condition, but at the time of data collection, none were reported to be deceased
    - This includes all the patients with an endpoint to seek immediate emergency care

- Artificial intelligence (AI) offers future potential ways of refining depression symptom self-checkers
  - Our previous research supports AI for analyzing portal messages for language predictive of suicide
    - One possibility would be to link AI chart review including portal messages to help assess risk and assist with triage
  - AI might direct automated follow up messages within an hour of self-triage to inquire if patients have sought emergency care
  - The possibility of AI connecting patients with appropriate cognitive behavioral therapy instead of waiting for a provider visit could also be explored

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LIMITATIONS

- A major limitation was that we could not capture all relevant outcomes
  - For example, our self-triage gives the suicide hotline number as a resource, which was not captured
    - We also did not know if patient portal messages that occurred within seven days of self-triaging were sent by the health care team or the patient, or if the content referred to mental health topics
  - Nor did our study design allow us to know if nurse triage calls, televisits/eVisits, or in person visits that occurred within seven days of self-triage were for mood or depression topics
- Finally, we do not know if patients sought care elsewhere within seven days of self-triaging
  - And we did not review if they received care at our institution more than seven days after self-triaging

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CONCLUSIONS

- Most patients did not follow the specific recommendations provided by the self-triaging tool
  - However, most patients did receive follow up care of some sort within seven days of using the tool
- There were no deaths within seven days of using the self-triage tool or even at 4 months after
- Notably 10.8% of patients using the tool were triaged to endpoints (call current provider, schedule visit, home care) not requiring urgent health care team input or contact
- These findings suggest that this depression self-triage tool has the potential to safely allow patients to self-triage their depression symptoms and potentially offload some work
- Future studies could confirm these findings in other health care systems while potentially incorporating AI to improve triage and follow up

QUESTIONS & ANSWERS

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