Patient-targeted smartphone apps for systemic lupus erythematosus: A systematic review and assessment of features and quality

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OBJECTIVES

- To identify smartphone apps targeted to patients with systemic lupus erythematosus (SLE), classify their functions, assess their quality using a reliable and objective scale, and to explore themes related to consumer perspectives through qualitative content analysis of user reviews

METHODS

- Android and iPhone apps were searched on the Google Play Store and the App Store, respectively in January 2018 using "lupus" or "SLE" as search terms
- Apps were included if they were: (1) smartphone-based; (2) compatible with the Android or iOS operating systems; (3) in the English language; (4) targeted to people with SLE; and (5) available for download in either of the two app stores. Apps were excluded if they were: (1) targeting a condition other than SLE; (2) including only treatment algorithms; or (3) for health care providers
- App name, platform (Android, iPhone), developer, current version, cost, and user star ratings and comments were extracted
- The Mobile App Rating Scale (MARS) was used to classify and rate the apps
- A qualitative content analysis of user reviews was performed using an inductive approach

RESULTS (identification and classification)

App identification and screening

- Search results yielded 315 apps; 32 apps met inclusion criteria (**Figure 1**)
- Theoretical background or strategies behind apps in both platforms was mainly to provide information or education regarding SLE (**Figure 2**)
- No apps provided information from reliable (i.e., cited, evidence-based) sources

Android apps (n = 19)

- 16 were free, and the remaining cost 2.93 – 5.65 CAD
- The user star ratings of the apps ranged from 1.5 – 5.0 stars (out of 5.0) and the number of user ratings ranged from 1 – 288

iPhone apps (n = 13)

- 10 were free, and the remaining cost 2.79 – 6.99 CAD
- No user ratings or comments were available
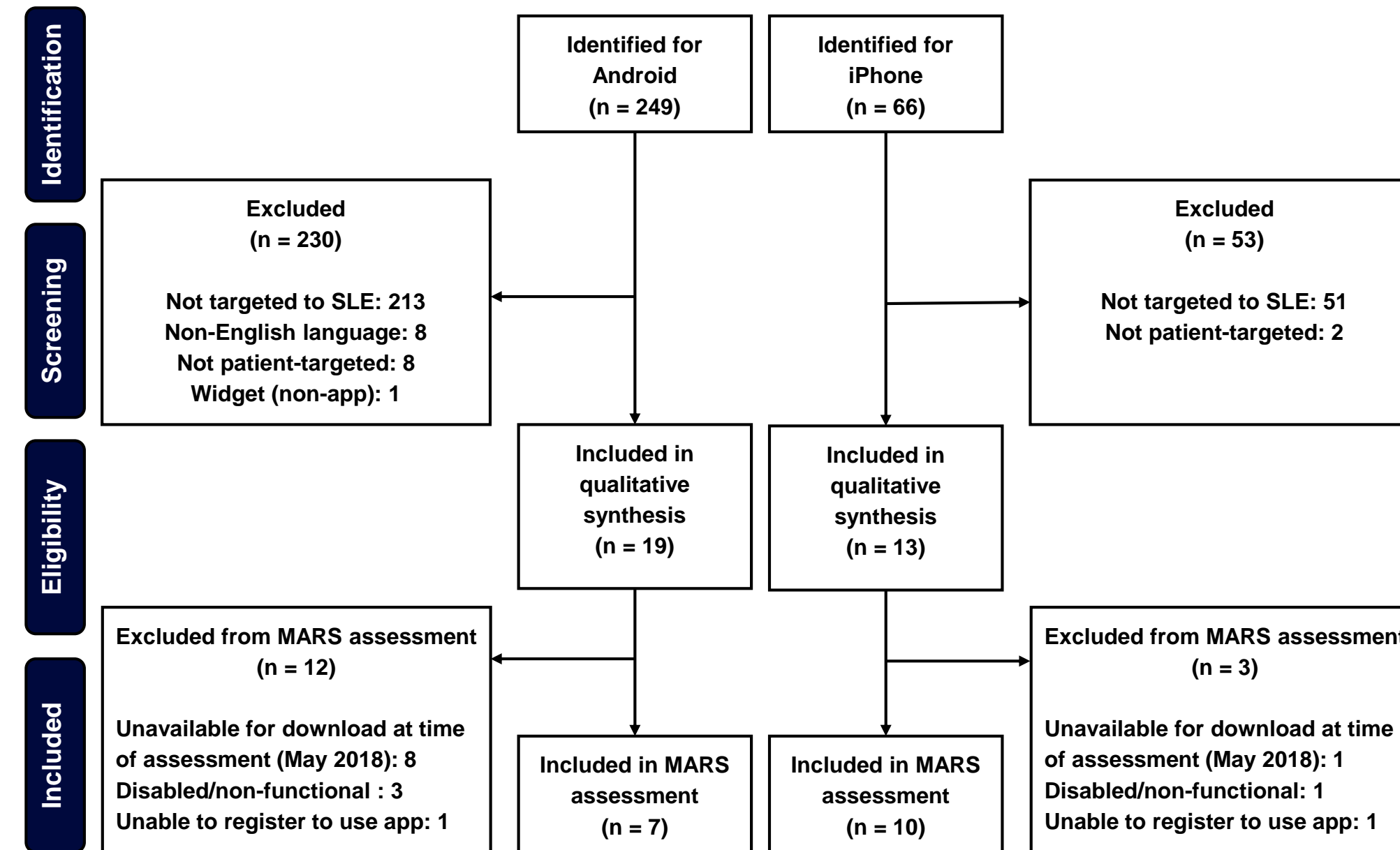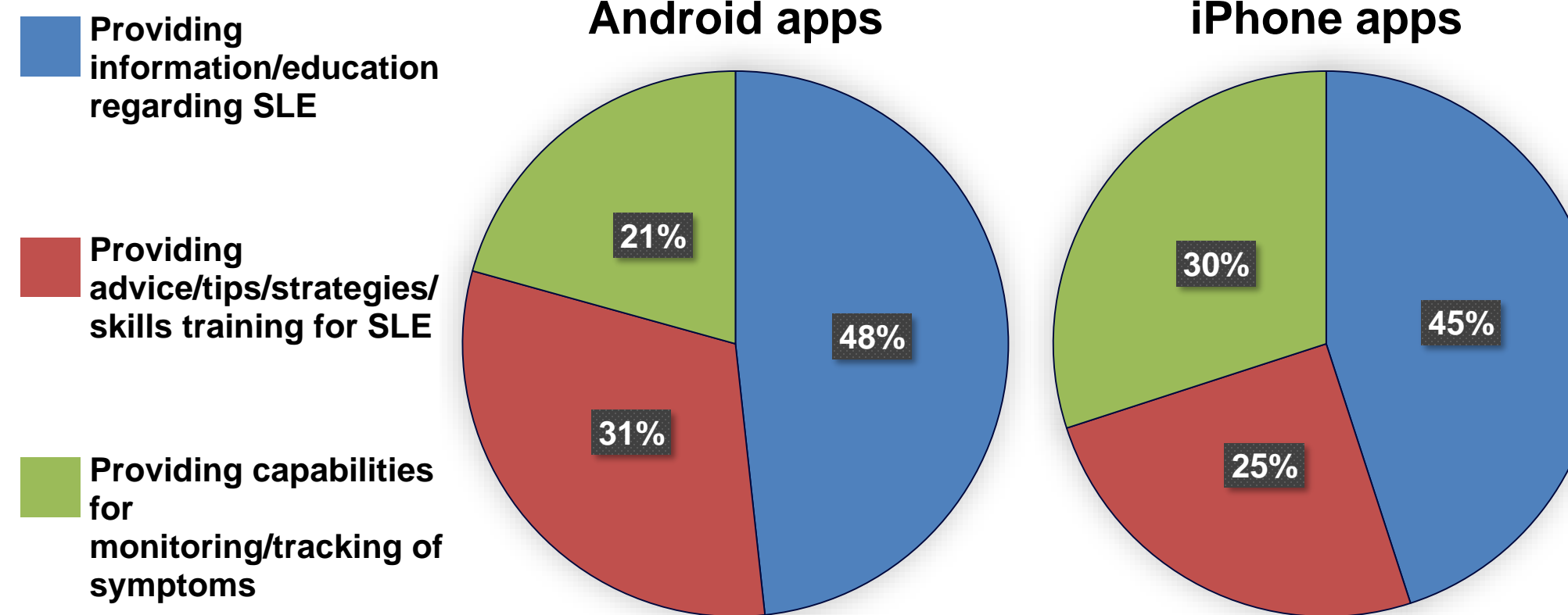
Figure 1: Modified PRISMA flow diagram

Identification

Identified for Android (n = 249)

Identified for iPhone (n = 66)

Screening

Excluded (n = 230)

Not targeted to SLE: 213
Non-English language: 8
Not patient-targeted: 8
Widget (non-app): 1

Excluded (n = 53)

Not targeted to SLE: 51
Not patient-targeted: 2

Eligibility

Included in qualitative synthesis (n = 19)

Included in qualitative synthesis (n = 13)

Included

Excluded from MARS assessment (n = 12)

Unavailable for download at time of assessment (May 2018): 8
Disabled/non-functional : 3
Unable to register to use app: 1

Included in MARS assessment (n = 7)

Included in MARS assessment (n = 10)

Excluded from MARS assessment (n = 3)

Unavailable for download at time of assessment (May 2018): 1
Disabled/non-functional: 1
Unable to register to use app: 1

Figure 2: Theoretical background or strategies behind apps

- Providing information/education regarding SLE
- Providing advice/tips/strategies/skills training for SLE
- Providing capabilities for monitoring/tracking of symptoms

Android apps: 48%, 31%, 21%

iPhone apps: 45%, 25%, 30%

RESULTS (quality assessment and content analysis)

App rating scale using MARS

- Android apps: mean overall rating ranged from 2.3 – 3.9 (out of 5.0)
- iPhone apps: mean overall rating ranged from 2.8 – 3.9 (out of 5.0)

Content analysis of user comments

- 184 unique user comments were coded (all from Android apps)

Theme 1: Seeking the ability to track disease-related items (e.g., symptoms, medication, appointments)

- *"It would also be helpful to be able to track severity/ duration of symptoms."*
- *"If u have many symptoms every day and want to keep track of severity/ fluctuations, then this is not the app for u."*
- *"I was expecting more on the app such as a tracker for meds, appointments, severity of flares etc."*

Theme 2: Sense of community with others who have SLE

- *"It's great to have a support group at my finger tips."*
- *"It's nice to know you aren't alone with this disease."*
- *"It's a great place to talk to others who know exactly what your going through. You don't have to fight the battle on your own.:)"*

CONCLUSIONS

- The intention of most apps was to provide information/education regarding SLE; however, no apps provided references to reliable sources
- There was a paucity of apps providing tracking functionalities, and a major theme identified from content analysis of user reviews was seeking more and better tracking functionalities for symptoms, medication, and appointments
- A sense of community was also identified from user provided comments, highlighting the positive role mHealth may play in providing social support
- Overall, the findings of this review suggest that there is a lack of high-quality apps targeted to people with SLE, and that a major unmet need is the ability to track disease-related items

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