Features of Mobile Application for Diabetes Self-management in China: Do They Fit for Older Adults?

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Background

- Mobile apps for self-managing diabetes are increasingly popular
- Limited research on diabetes apps features acceptable to Chinese older adults
- No research on the alignment of content with evidence-based guidelines

Purpose

1. Provide overview of features and contents of Chinese diabetes apps for self-management
2. Evaluate fit of Chinese diabetes apps with usability requirements for older adults
3. Examine alignment of the diabetes apps with issues specific to older adults
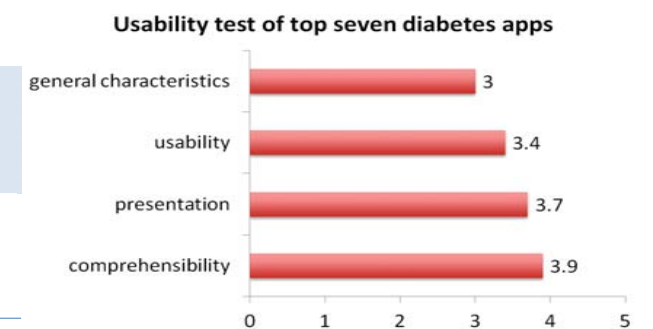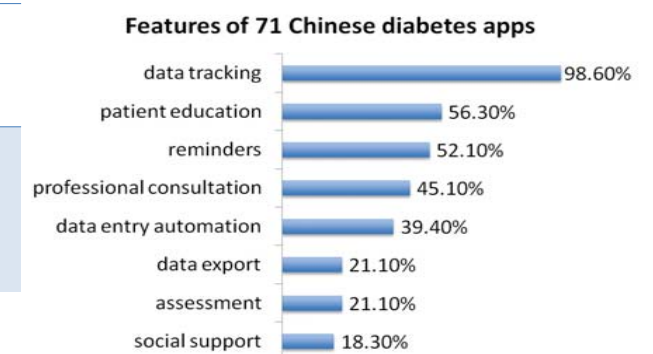
Method

1. **Review diabetes apps**
   Data source: Apple app store and 360 Mobile Assistant
2. **Usability test**
   Tool: Usability and assessment criteria for older adults[1]
   Sample: Top seven diabetes apps in China in iOS system
3. **Comparison** the included 71 apps with the International Diabetes Federation (IDF) guideline for managing older people with type 2 diabetes[2]

Results

- 71 Chinese diabetes apps were included
- Most diabetes apps were multi-featured
- Usability of all tested apps was rated moderate to good
- 4 guideline areas were generally absent: depression, falls, pain and sexual health
- Hypoglycemia, nutrition, fluid consumption, and education features were inadequate

Areas	Guideline Recommendations	Description of relevant features/ contents in 71 diabetes apps
Depression	•Screening for and monitoring of depressive symptoms •Involvement of the family in assessment	•Emotion recording: 11 apps (15.5%) •Depression assessment: 1 app (1.4%)
Falls	•Provide education about fall prevention •Provide a referral or intervention •Undertake home safety checks and modifications in collaboration with patient and their family	•Providing education about falls seldom appeared in education
Pain	•Assess pain risk •Provide an appropriate pain assessment tool •Provide a referral	•Providing education about pain seldom appeared in education
Sexual health	•Assess sexual health and well-being •provide appropriate counseling and management	•Providing education about sexual seldom appeared in education

Features of 71 Chinese diabetes apps
- data tracking 98.60%
- patient education 56.30%
- reminders 52.10%
- professional consultation 45.10%
- data entry automation 39.40%
- data export 21.10%
- assessment 21.10%
- social support 18.30%

Usability test of top seven diabetes apps
- general characteristics 3
- usability 3.4
- presentation 3.7
- comprehensibility 3.9

Discussion

- Periodic assessment of hypoglycemia risk, depression, pain, and sexual health could be added to future diabetes apps.
- Individualized education based on assessments and daily data recording, as well as reviews and summaries of key points should be sent to the older adults and their caregivers.
- Usability domains such as size of operating elements, fault tolerance, and instant feedback need to be addressed.
- To increase the flexibility and usefulness of diabetes apps, functions not needed by a particular user or at a particular time could be hidden, and reestablished when needed.

References

1.Arnhold M, Quade M, Kirch W, (2014).Mobile Applications for Diabetics: A Systematic Review and Expert-Based Usability Evaluation Considering the Special Requirements of Diabetes Patients Age 50 Years or Older, Journal of Medical Internet Research, 16(4),e104.
2.International Diabetes Federation. (2013).Managing older people with type 2 diabetes: global guideline, http://www.idf.org/sites/default/files/IDF-Guideline-for-older-people-T2D.pdf