

## OBJECTIVE

To identify evidence concerning the effectiveness of mobile applications and wearable devices as interventions for weight loss in overweight and obese adults, compared to traditional weight loss programs

## INTRODUCTION

Obesity is a costly epidemic (\$147B/year) affecting 39.8% of US adults (CDC, 2018). One possible strategy is implementing digital health technology to help consumers make informed decisions about their own health. Smartphone apps and wearables are two types of digital health with the capacity to deliver cost-effective and personalized weight loss interventions. Research is needed to determine if they have the potential to impact the obesity epidemic by raising health awareness and motivating users to increase activity.

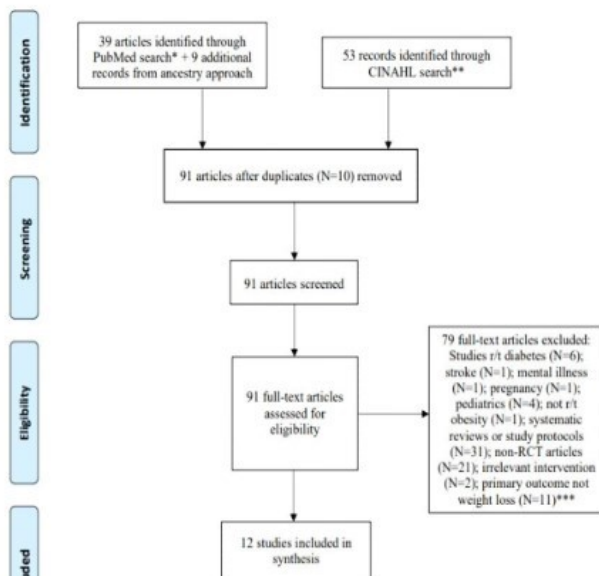
## RESULTS

Table 1. EPHPP Quality Assessment Ratings

Study	Selection bias	Study design	Confounders	Blinding	Data collection methods	Withdrawals/ drop outs	Overall rating
Brindal et al. 2013	2	1	3	2	1	2	2
Burke et al. 2011	1	1	3	2	2	1	2
Godino et al. 2016	2	1	3	2	2	1	2
Hales et al. 2016	2	1	3	3	2	1	3
He et al. 2017	2	1	1	3	2	1	2
Jakicic et al. 2016	2	1	3	3	2	2	3
Siriwoen et al. 2018	1	1	3	3	1	1	3
Spring et al. 2017	1	1	3	2	2	1	2
Svetkey et al. 2015	1	1	3	3	3	1	3
Thomas et al. 2017	1	1	3	2	1	1	2
Toro-Ramos et al. 2017	1	1	3	3	2	1	3
Turner-McGrievy et al. 2017	2	1	3	2	2	2	2

Note: Quality rating scores 1 = Strong, 2 = Moderate, 3 = Weak. Studies with no weak ratings and at least four strong ratings are considered strong. Those with less than four strong ratings and one weak rating are considered moderate, while those with two or more weak ratings are considered weak.

## METHODS



\*["Obesity"[Mesh] OR "Overweight"[Mesh] AND "Mobile Applications"[Mesh] OR "Wearable Electronic Devices"[Mesh] AND "Weight Loss"[Mesh]

\*\*[MH] Obesity AND [MH] Mobile applications OR [MH] Wearable electronic devices AND [MH] Weight loss

## RESULTS

- 10/12 studies utilized a mobile application
  - 5/10 of these necessary for intervention delivery
  - 10/10 used apps for self-monitoring features
- 5/12 studies incorporated wearables used to self-monitor physical activity, step count, or bite count
  - 2/5 used wearables with no apps
  - 3/5 used combination of wearables and apps
- 5/12 studies involved regular in-person contact with practitioners and researchers during group sessions
- 3/12 studies used electronic counseling methods

### Weight Loss Over Time

- 6/12 studies examined weight loss over time
  - All 6 found statistically significant weight loss either in all participants, or in intervention participants, over the course of the study period (12 weeks – 2 years)

### Weight Loss Differences Between Groups

- 11/12 studies discussed differences between groups
  - 6/11 found that intervention, or enhanced intervention, groups sustained greater weight loss than control group
  - 2/11 found no significant group differences
  - 2/11 used both app + wearables; found greater weight loss in app group than wearable group
  - 1/11 found less weight loss in enhanced intervention group with wearable vs standard website group

## DISCUSSION

- Mobile technology effective for clinically meaningful weight loss of 5% or more (based on 6 'weight loss over time' studies)
- Four studies examined sustained, long-term weight loss
  - Weight loss differences between groups did not persist in the long run following study periods
  - Further research needed on user adherence

### Limitations

- All 9 RCT studies had no non-intervention comparator groups; all participants received some intervention
- Vast variation in conditions between study interventions
- Study findings should be interpreted with caution due to subpar EPHPP quality ratings of moderate and weak
- Lack of confounder control and blinding; selection bias

## CONCLUSION

- Mobile apps and wearables present low-cost, effective method of delivering weight loss interventions to overweight and obese adults
- Wearables work better as adjunct rather than alone
- No definitive conclusion on the relative effectiveness of mobile apps and wearables over other self-monitoring methods used for weight loss
- Mobile technology is effective for promoting self-regulation and healthy behavior modification, making them ideal tools for integration into holistic weight loss strategies recommended in the primary care setting