

## Appendix 1. PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
<b>TITLE</b>			
Title	1	Identify the report as a systematic review.	Title
<b>ABSTRACT</b>			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Abstract
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Introduction
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Introduction
<b>METHODS</b>			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Literature Search, Inclusion Criteria and Selection
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Literature Search, Inclusion Criteria and Selection
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Literature Search, Inclusion Criteria and Selection
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Inclusion Criteria and Selection
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Inclusion Criteria and Selection
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Statistical Analysis, Literature Search Results, Study Characteristics and Coding
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Statistical Analysis, Literature Search Results, Study Characteristics and Coding

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Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Risk of Bias Assessment
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Statistical Analysis
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Statistical Analysis
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Statistical Analysis
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Statistical Analysis
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Statistical Analysis
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Statistical Analysis
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Statistical Analysis
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Risk of Bias Assessment
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Statistical Analysis
<b>RESULTS</b>			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Literature Search, figure 1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Inclusion Criteria and Selection
Study characteristics	17	Cite each included study and present its characteristics.	Table 1
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Figures 4a-4c
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Table 1
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Results
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Results
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Results
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Results
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Results
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Results

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<b>DISCUSSION</b>			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Discussion
	23b	Discuss any limitations of the evidence included in the review.	Discussion
	23c	Discuss any limitations of the review processes used.	Discussion
	23d	Discuss implications of the results for practice, policy, and future research.	Discussion
<b>OTHER INFORMATION</b>			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	NA
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	NA
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	NA
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Funding
Competing interests	26	Declare any competing interests of review authors.	Declarations of Conflicting Interests
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	NA. Contact the authors.

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71

For more information, visit: <http://www.prisma-statement.org/>

## Appendix 2. Summary of Included Studies.

Study	Participation characteristics	Intervention	Outcome measures
Bond et al.,2014	Overweight/obese individuals	The intervention strategy merges a smartphone gadget that includes an onboard accelerometer with a mobile application to monitor real-time sedentary behavior. It reminds people of their physical activity break goal and encourages for performing a break.	Sedentary time
Dorsch et al., 2020	Adults with hypertension	The intervention uses an app to send push notifications to deliver tailored messages to participants when they enter a grocery store, restaurant, or home with the aim of promoting behavior change. The mobile app provides various features such as displaying alternative low-sodium options for the user's top 5 high-sodium foods, curating a list of low-sodium meal choices at restaurants, and allowing users to search restaurant menus prioritized by low sodium content. Additionally, the app provides users with the ability to scan universal product codes of grocery store items to find similar food options with lower sodium content. The nutrition information for grocery stores and restaurants is provided through an API from a standard nutrition database.	Urinary sodium excretion
Finkelstein et al.,2015	Overweight women	The intervention tracks real-time inactivity, alerts individuals when a pre-set period of inactivity has been reached, encourages them to engage in physical activity, and offers personalized feedback through a web-based interface.	Step count
Forman et al., 2019a&b	Overweight/obese individuals	The intervention uses an app to gather information on instances of slipping up and the factors that lead to them. Through the use of an advanced machine learning algorithm that is constantly updated, the app is able to anticipate the likelihood of such lapses occurring and provide personalized interventions whenever the risk of relapse is high.	Weight
Goldstein, et al., 2020	Overweight/obese individuals	The intervention uses a mobile app to anticipate deviations from dietary guidelines and offers customized interventions to address particular risk factors.	Weight
Hiremath et al., 2019	Individuals with spinal cord injury	The intervention uses an app-based health monitoring system that measures physical activity among people with spinal cord injuries in their daily lives and delivers messages in real-time to enhance their physical activity levels.	Physical activity levels
Pellegrini et al., 2015	Adults with type 2 diabetes	The intervention uses an app to disrupt extended periods ( $\geq 20$ min) of sitting among adults diagnosed with type 2 diabetes.	Sedentary time
Rabbi et al., 2015a	Professionals & students	The intervention uses an app (1) to incorporate a blend of automatic and manual logging techniques to monitor physical activity, user location, and dietary habits; (2) to automatically scrutinize logs of activity and food consumption to differentiate between recurring and irregular behaviors; and (3) to utilize a conventional machine learning algorithm for decision-making and generate personalized recommendations that urge users to either maintain, refrain from, or slightly adjust their current behaviors to facilitate the achievement of their behavioral objectives.	Physical activities & calorie information
Rabbi et al., 2015b	People in a university	The intervention uses an app to autonomously comprehend a user's physical activity and dietary patterns and suggest strategic modifications to promote a healthier lifestyle. To maximize calorie loss while ensuring user ease of adoption, the system utilizes a sequential decision-making algorithm. Moreover, to enhance adoption rates, the system incorporates an algorithm, taking into consideration the user's preferences.	Walking time, calories burnt in exercise, calorie intake in meals
Van Dantzig et al., 2013	Office workers	The intervention uses a mobile app to track both active movements and periods of inactivity and offers timely recommendations for taking breaks from sitting.	Physical activity
Van Dantzig et al., 2018	Office workers	The intervention uses a mobile app to provide participants with a daily personalized step goal and guide them to achieve it. Participants receive personalized coaching messages in real-time that were tailored to their specific situation.	Daily step count
Wahle et al., 2016	People with depression	The intervention uses sensor data to identify individuals with a clinically significant level of depression by detecting their daily-life activities. It delivers context-sensitive interventions to offer real-time support for individuals displaying symptoms of depression.	Depression based on sensor and a depression detection model

Wang et al., 2021	People who find it difficult to maintain running behavior	The intervention operates on a reinforcement learning framework, utilizes personal contextual information gathered by the application at each time step to assess the current status of a user and determine whether or not to issue a reminder. Additionally, the app monitors the physical activity patterns of the user following the receipt of reminders. This process understands the user's preferences by analyzing their historical data and employing the latest insights to inform future decisions.	Physical activity
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