

Appendix 6. Summary of included studies

Author(s) (Year) [Reference]	Context (patient characteristics; study setting; non-mobile co- intervention)	Theoretical base	Content	Delivery mode	Implementation procedure (length of intervention period; frequency; timing; baseline and follow-up assessment; other tricks)	Health outcome
Aharonovich et al. (2017)	AUD patients with HIV and use of drug, mean age: 51 years; Community-based setting; MI	NR (But the author claimed that the design of HealthCall app is theory-based)	(1) general queries about quantity of alcohol use, level of desire and commitment (2) personalized alcohol use graph (3) reinforcement of alcohol abstinence (4) daily “tip” video in which a counselor introduced skills to cut down alcohol use (5) referrals to call counsellor (6) reminders about sticking to the goal (7) a reminder if not use the App more than 24 hours	App (HealthCall-S)	60 days; Daily use (3mins/day); Morning, afternoon or evening decided by the participants but need to be consistent every day; Baseline assessment, 30-days assessment, 60-day assessment; Provision of the study smartphone with the data plan, provision of \$40 worth of gift card per assessment visit	No significant outcome for all following measurements: reduced DD, reduced DDD
Gajecki et al. (2017)	AUD students, mean age: 25 years; University setting; NR	NR	(1) queries about alcohol use (2) a guideline for UAU (3) prevention skills for dealing with relapse, including risk simulation analysis, alcohol refusal, relax, positive thinking exercises and urge surfing training	App (TeleCoachTM)	12 weeks; Once weekly; NR; Baseline assessment, 6-week assessment, 12-week assessment; NR	SD (6-week assessment): IG<CG ($P=0.037$), no longer significant at 12-week assessment Frequency (6-week and 12-week assessments): IG<CG ($P=0.041$, $P=0.034$) No significant outcome for all following measurements: binge occasions, average eBAC, peak eBAC
Muench et al. (2017)	Risky drinking adults, mean age: 43 years; Community-based setting; Participants learned NIAAA guidelines for safe alcohol use and a document regarding how to respond mobile assessment	Social learning theory, health belief model	(1) queries about alcohol use (2a) loss-frame IG (LF): negative consequences of problem drinking (2b) gain-frame IG (GF): benefits of reducing drinking to safe guidelines (2c) statically tailored content IG (ST): tailored messages based on individual responses to baseline assessment (2d) tailored adaptive IG (TA) (2d1) individual tailored SMSs according to goal achievement (2d2) 2 SMSs with participant’s name at the heaviest typical drinking times (2d3) a supportive message to response one of the automated system keywords sent by the participant	SMS	12 weeks; Once weekly (4 SMSs) for content (1) and each SMS would be resent 3 more times in next 2 hours if no response within 1.5 hour for all IGs Once daily for content (2a), (2b), and (2c) to LF, GF and ST&TA respectively at 6:00 pm Once weekly for content (2d1) and (2d2); Immediately for content (2d3); Baseline assessment, 12-week assessment; NR	Reduction of weekly SD: LF>MA ($P=0.03$), ST>MA ($P=0.01$), TA>MA ($P=0.00$) Reduction of weekly HDD: LF>MA ($P=0.05$), ST>MA ($P=0.01$), TA>MA ($P=0.00$) Increase of weekly abstinent days: GF>MA ($P=0.03$), ST>MA ($P=0.04$), TA>MA ($P=0.02$)
Riordan et al. (2017)	Risky drinking students, mean age: 18.5 years;	NR	Potential social consequence of UAU with colloquial tone	SMS	1 week (orientation week) 4 times week;	(1) In College 1: SD during orientation week:

	University setting; NR				Tuesday, Thursday, Friday and Saturday night at 19:00 and 21:00; Baseline assessment, 1-week assessment, 1-semester assessment; Provision of opportunity to win a mobile phone and prize of cash	IG<CG ($P=0.18$), SD during the 1 st semester: IG<CG ($P=0.39$) (2) In college 2: There are no significant differences in terms of alcohol use, but male students consumed significantly more alcohol than the female students ($P<0.001$).
Bock et al. (2016)	Risky drinking students, mean age: 22 years; College setting; NR	NR	(1) Alcohol facts (2) strategies to limit alcohol use and alcohol-related risks (3) motivation (4) a supportive message to response one of the automated system keywords sent by the participant	SMS	6 weeks; Once weekly (6 SMSs) for content (1)-(3), immediately for content (6); Thursday and Sunday evening (1 SMS for each day), Friday and Saturday evening (2 SMSs for each day); Baseline assessment; 6-week assessment; 12-week assessment; NR	No significant outcome for all following measurements: Drinking days per month HDD per month DDD eBAC Drinking days per past 2 weeks Negative consequence Strategies to limit drinking Brief situational confidence
Andersson (2015)	Risky drinking students, mean age: 23 years; University setting; NR	NR	(1) personalized feedback for assessment results (2) information on risk of negative consequences (3) information on SD (4) personalized recommendations for alcohol use (5) information for increasing tolerance and goal-setting	IVR	1 week for single IG and 4 weeks for repeated IG; Once daily; NR; Baseline assessment, 5-week assessment (4 weeks after intervention for single IG or 1 week after the intervention for repeat IG); NR	Reduction of peak eBAC: IG (total)>CG ($P=0.023$), IG (repeated)>CG ($P=0.046$) Reduction of AUDIT score: IG (total)>CG ($P=0.000$), IG (single)>CG ($P=0.001$), IG (repeated)>CG ($P=0.001$) DDD, frequency of drinking, mean BAC: not significant
Haug et al. (2015)	AUD patients, mean age: 47 years; Clinical setting; NR	Theory of planned behaviour	(1) personalized queries for monitoring drinking goals (2) personalized motivation of maintaining drinking goal according to their replies (3) a reminder to the counsellor if no SMS reply over 2 days	SMS	6 months; Once weekly (weeks 1-8) and bi-weekly (weeks 10-26) for content (1), Immediately for content (2); Monday at 18:00; Baseline assessment; 6-month assessment Phone calls from the therapist for support, empathy and further help	No significant outcome for AUDIT-C score
Riordan et al. (2015)	Risky drinking students, mean age: 22 years; University setting; NR	Social cognition models Social cognitive theory	(1) social consequence of alcohol use (2) health consequence of alcohol use (3) queries about alcohol use	SMS	1 week (orientation week); Once daily;	Reduction of SD during Orientation Week (women only): IG<CG ($P<0.05$) Reduction of SD during the

		Theory of planned behavior Self-determination theory Model of action phases			Tuesday, Thursday and Saturday night (3 SMSs) at 19:30 for content (1) Monday, Wednesday and Friday night (3 SMSs) at 19:30 for content (2) Thursday, Friday, Saturday and Sunday (4 SMSs) for content (3); Baseline assessment; 1-week assessment, 1-semester assessment; NR	first semester (women only): IG<CG ($P<0.05$)
Suffoletto et al. (2015) Suffoletto et al. (2014)*	Risky drinking emergency department patients, mean age: 22 years; Hospital setting; MI	Health belief model, information motivation behaviour model, theory of reasoned action, theory of planned behavior	(1) queries for reporting weekend drinking and binge plans (2) decision not to set a low-risk goal (2a) If “Yes”, queries for reporting low-risk goal setting and feedback to promote reflection on drinking plan (2b) If “No”, feedback to strengthen low-risk drinking plan/goal (3) queries for reporting alcohol use (3a) feedback to support low-risk drinking behavior for adherence (3b) feedback to promote reflection on alcohol consumption for non-adherence	SMS	12 weeks; Twice weekly; Thursday for contents (1) and (2), Sunday for contents (3); Baseline assessment, 3-month assessment, 6-month assessment, 9-month assessment; NR	HDD (at all assessments): IG<CG (significant intervention by time interaction) DDD (at all assessments): IG<CG (significant intervention by time interaction) Binge drinking prevalence (at all assessment): IG<CG (significant intervention by time interaction) Alcohol-related injury prevalence (at 9-month assessment): IG<CG, not significant at others
Bendtsen & Bendtsen (2014)	Risky drinking students, mean age: 24 years; University setting; NR	Social cognition models, social cognitive theory, theory of planned behaviour, self-determination theory, model of action phases	(1) food for thought queries (2) task (3) challenges (4) reflective	SMS	4 weeks; 4 times weekly (4 SMSs); Wednesday for content (1), Friday for content (2), Saturday for content (3) and Sunday for content (4); Baseline assessment, 4-week assessment;	No significant outcome for all following measurements: Perceived drinking compared with peers Motivation to change
Brendryen et al. (2014)	Risky drinking adults, mean age: 39 years; Community-based setting; NR	NR	(1) personalized comparison of the reported drinking habits to the recommended gender-matched low-risk drinking guidelines and national gender-matched averages (2) 62 online sessions include four aspects: goal-setting and daily alcohol use track record, relapse prevention, emotion regulation and alcohol education.	SMS	6 months; 1 session daily for the first 56 sessions, 1 session weekly for sessions 57-60, 1 session monthly for sessions 61 and 62; Available on demand; Baseline assessment, 2-month assessment, 6-month assessment;	Weekly alcohol consumption: IG<CG ($P=0.049$) FAST score: not significant

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Gajecki et al. (2014)	Risky drinking and AUD students, mean age: 25 years; University setting NR	Theory of planned behavior	(1) register for alcohol use (2) eBAC result (3) notification (4) strategies to control alcohol use if a participant's alcohol use could lead to BAC>0.06%	App (Promillekoll)	7 weeks; Real-time use; Baseline assessment, 7-weeks assessment; NR	SD per week, binge occasions, eBAC per week, peak eBAC per month: not significant Drinking frequency (time-by-group interaction): IG>CG ($P=0.001$) Drinking frequency (male): IG>CG ($P=0.001$)
		Theory of planned behavior	(1) a simulation of a planned drinking occasion for setting personal eBAC (2) register for alcohol use (3) eBAC result (4) comparison of planned eBAC with actual eBAC	App (PartyPlanner)		
Gustafson et al. (2014)	AUD patients, mean age: 38 years; Nonprofit treatment organization setting NR	Self-determination theory	(1) anonymous discussion (2) question and answer (3) instant library (4) experience and knowledge sharing (5) web-links (6) distress easing (7) warning when near high-risk alcohol place based on GPS tech (8) brief survey to obtain patient data on negative affect, lifestyle balance, and recent substance use	App (A-CHESS)	8 months; Real-time use, once weekly for content (8); Baseline assessment, 4-month assessment, 8-month assessment, 12-month assessment; NR	HDD (4-month and 12-month assessments): IG>CG ($P=0.002$, $P=0.003$), not significant at 8-month assessment Prevalence and odds of abstinence (8-month and 12-month assessments, overall): IG>CG ($P=0.004$, $P=0.002$, $P=0.003$), not significant at 4-month assessment
Lucht et al. (2014)	AUD patients, mean age: 46 years Hospital setting NR	NR	(1) queries about alcohol use (2) referrals for further help (3) general automatic supportive feedback (4) a reminder to the therapist if no SMS reply more than 24 hours	SMS	8 weeks; Twice weekly; Monday and Thursday; Baseline assessment, 30-day assessment, 60-day assessment; Phone calls from the therapist for support, empathy and further help	DD: No significant outcome DDD: No significant outcome, but small effect in favor of IG HDD: No significant outcome
Mason et al. (2014)	Risky drinking students, mean age: 19 years College setting; MI	Social network counselling	(1) queries about drinking facts (2) social norms (3) social risk (4) protective behavioral "boosts" if requested	SMS	4 consecutive days; 4-6 SMSs daily; NR; Baseline assessment, 1-month assessment; NR	Readiness to change alcohol use: IG↑, CG↓ ($P<0.01$) AUDIT, SD, Alcohol expectations, Importance of changing, Confidence in ability to change, intentions to reduce alcohol use, taking steps to reduce alcohol use: not significant
Witkiewitz et al. (2014)	Risky drinking students with smoking, mean age: 20.5 years College setting; MI	Cognitive-behavioral treatment	(1) normative feedback (2) general or health information on alcohol use (3) protective behavioral strategies for alcohol use (4) alternative activities to alcohol use (5) urge-surfing	App (BASICS-Mobile)	14 days; Real-time use; NR; Baseline assessment, 14-day assessment, 1.5-month assessment; NR	No significant outcome for all following measurements: DDD HDD Young Adult Alcohol Problem Screening Test

			(6) decisional balance for alcohol use			
Agyapong et al. (2013) Agyapong et al. (2012)*	AUD patients with unipolar depression, mean age: 48 years; Hospital setting NR	NR	(1) promoting alcohol abstinence (2) dealing with cravings (3) promoting medication adherence (4) providing general support	SMS	3 months; Twice daily (180 SMSs randomly sent); 10:00 and 19:00; Baseline assessment, 3-month assessment, 6-month assessment (published in 2013); NR	Cumulative abstinence duration (3-month and 6-month assessment): IG>CG (not significant); Alcohol Abstinence Self Efficacy Scale (3-month assessment): IG>CG (P=0.02), no longer significance at 6-month assessment; Days to first drink (6-month assessment): IG>CG (P=0.01), not significant at 3-month assessment; DDD (3-month and 6-month assessment): IG<CG (not significant)
Alessi & Petry (2013)	Risky drinking adults, mean age: 34 years; Community-based setting; NR	Contingency management	(1) Reminder about BrAC video submission (2) Reminder about possible compensation for valid on-time video	SMS	4 weeks; 1-3 times daily; From 8 am to 11 pm (concentrated in evenings from 6 pm to 11 pm and weekends); Baseline assessment, 4-weeks assessment; Monetary incentives	Percentage of n-BrAC: IG>CG (P=0.00) Longest abstinent days: IG>CG (P=0.00) Reduction of DD: IG>CG (P=0.00) Reduction of Alcohol Addiction Severity Index: IG>CG (P=0.01) Reduction of overall Drinker Inventory of Consequences: IG>CG (P=0.00) Reduction of DDD: not significant
Hasin et al. (2013)	HIV patients with risky drinking and AUD, mean age: 46 years Clinical settings; MI and training	NR	(1) queries about alcohol consumption (2) queries about reasons for drinking/abstinence (3) queries about mood (4) queries about medication adherence (5) queries about wellbeing (6) reminder about continuous participation if missed two consecutive calls	IVR	60 days (first session for 30 days repeated second session for 30 days); 1-3 minutes daily; Baseline assessment, 30-day assessment, 60-day assessment, 90-day assessment, 180-day assessment, 365-day assessment; NR	Reduction of DD (60-day assessment): IG>CG (P<0.01); IG>CG (P=0.03), no longer significance after 60-days

AUD: alcohol use disorder
CG: control group
DD: drinking day
DDD: drink per drinking day
HDD: heavy drinking day
IG: intervention group
IVR: interactive voice response
MI: motivational interviewing
NR: not reported
SMS: short message service

