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Table: Overview of studies

Coriol	Danas	Ohioativ	Intource	Intourion	Intorrontion	Theory	Darsanali	Ilon
Serial	Paper	Objectiv	Interve	Interven	Intervention	Theor	Personali	User
number	referen	e	ntion	tion	generation	etical	zation	model
	ce		present	generati	technique	model		
			ation	on				
1	Vandel	Healthy	Websit	Automa	Knowledge-	TPB ^a	Goal and	PA ^c
	anotte	lifestyle	e	tic	based	and	activity	profile,
	et al [1]					TTM ^b	recomme	demogr
							ndation	aphics,
							and	BCT ^d
							educatio	paramet
							nal and	ers, and
							motivatio	context
							nal	ual
							content	informa
								tion
2	Ahire	Healthy	Websit	Automa	Knowledge-	_	Activity	PA
	et al [2]	lifestyle:	e	tic	based and		recomme	profile,
		diet and			data-driven–		ndation	demogr
		exercise			decision tree			aphics,
								medical
								data,
								and
								context
								ual
								informa
								tion
3	Mukhta	Healthy	Mobile	Automa	Knowledge-	Fogg's	Activity	PA
	r [3]	lifestyle:	арр	tic	based	Behav	recomme	profile,

		exercise	widget			ior	ndation	demogr
		and diet				Model	and	aphics,
						and	interventi	medical
						variou	on timing	data,
						S		and
						clinica		context
						1		ual
						guideli		informa
						nes for		tion
						health		
						care		
4	Tseng	Healthy	Websit	Semiaut	Knowledge-		Goal and	PA
	et al [4]	lifestyle:	e and	omated	based		activity	profile
		exercise	mobile				recomme	and
		and diet	app				ndation	medical
								data
5	Storm	Healthy	Websit	Automa	Knowledge-	HAPA	Educatio	PA
	et al [5]	lifestyle:	e	tic	based	e	nal and	profile,
		exercise					motivatio	demogr
		and					nal	aphics,
		fruits					content	and
		and						ВСТ
		vegetabl						paramet
		e						ers
		consump						
		tion						
6	Schulz	Healthy	Websit	Automa	Knowledge-	I-	Motivati	PA
	et al [6]	lifestyle:	e	tic	based	Chang	onal	profile,
		PA, diet,				e	content	demogr
		alcohol,				Model		aphics,
		and						medical
		smoking						data,

								and
								context
								ual
								informa
								tion
7	Herme	Healthy	Mobile	Automa	Combined	Stage	Goal and	PA
	ns et al	lifestyle:	арр	tic	knowledge-	of	activity	profile,
	[7]	personali			based and	chang	recomme	demogr
		zed			data-driven	e	ndation,	aphics,
		coaching				model	motivatio	ВСТ
		system					nal	paramet
							content,	ers, and
							interventi	context
							on timing	ual
								informa
								tion
8	Lee et	Healthy	Websit	Automa	Knowledge-	Ameri	Goal and	PA
	al [8]	lifestyle:	e	tic	based	can	activity	profile,
		exercise				Cance	recomme	demogr
		and diet				r	ndation	aphics,
						Societ	and	BCT
						у	motivatio	paramet
						guideli	nal and	ers, and
1						Suracii		ĺ
						nes	educatio	context
						nes	educatio	context
						nes and TTM	educatio nal content	context ual informa tion
9	Fahim	Increase	Any	Automa	Combined	nes and TTM Center	educatio nal content Activity	context ual informa tion PA
9	Fahim et al [9]	Increase PA	device	Automa tic	knowledge-	nes and TTM Center s for	educatio nal content Activity recomme	context ual informa tion PA profile,
9			device from		knowledge- based and	nes and TTM Center	educatio nal content Activity	context ual informa tion PA
9			device		knowledge-	nes and TTM Center s for	educatio nal content Activity recomme	context ual informa tion PA profile,

						l and		context
						Preven		ual
						tion		informa
						guideli		tion
						nes		
10	Dharia	Increase	Mobile	Automa	Data-	_	Activity	PA
	et al	PA	app	tic	driven:collab		and	profile,
	[10]				orative		fitness	demogr
					filtering		partner	aphics,
							recomme	and
							ndation	context
							and	ual
							interventi	informa
							on timing	tion
11	Rabbi	Increase	Mobile	Automa	Data-	Princi	Goal and	PA
	et al	PA	арр	tic	driven:multi	ple of	activity	profile,
	[11]				armed bandit	SCT ^g	recomme	demogr
					and pareto	and	ndation	aphics,
					frontier	Fogg's		and
						Behav		context
						ior		ual
						Model		informa
						and		tion
			h			TTM		
12	Twardo	Increase	h	Automa	Data-	_	Goal and	PA
	wski et	PA		tic	driven:reco		activity	profile,
	al [12]				mmendation		recomme	demogr
					system		ndation	aphics,
								medical
								data,
								and
								context

								ual
								informa
								tion
13	Yom-	Increase	SMS ⁱ	Automa	Data-driven	_	Motivati	PA
	Tov et	PA		tic	reinforceme		onal	profile
	al [13]				nt learning		content	and
								demogr
		-	3611		- 1.			aphics
14	Lim et	Increase	Mobile	Automa	Data-driven-	_	Activity	PA
	al [14]	PA	арр	tic	RNN ^j		recomme	profile
							ndation	and
							and	context
							interventi	ual
							on timing	informa
		_						tion
15	Cook et	Increase	Websit	Automa	Knowledge-	TPB	Educatio	PA
	al [15]	PA	e	tic	based	and	nal and	profile,
						SCT	motivatio	demogr
							nal	aphics,
							content	and
								BCT
								paramet
								ers
16	Larsen	Increase	Websit	Automa	Knowledge-	SCT	Educatio	PA
	et al	PA	e	tic	based	and	nal	profile,
	[16]					TTM	content	demogr
								aphics,
								medical
								data,
								and
								ВСТ

								paramet
								ers
17	Short et	Increase	Print,	Automa	Knowledge-	SCT	Educatio	PA
	al [17]	PA	websit	tic	based		nal and	profile,
			e				motivatio	demogr
							nal	aphics,
							content	medical
								data,
								ВСТ
								paramet
								ers, and
								context
								ual
								informa
								tion
18	Boudre	Increase	Websit	Automa	Knowledge-	I-	Educatio	PA
	au et al	PA	e	tic	based	Chang	nal and	profile,
	[18]					e	motivatio	demogr
						model	nal	aphics,
							content	and
								BCT
								paramet
10	3.6	T	TAT 1	Δ	TZ 1 1 .	COTT	D1 .*	ers
19	Moreau	Increase	Websit	Automa	Knowledge-	SCT,	Educatio	PA
	et al	PA	e	tic	based	TPB,	nal and	profile,
	[19]					and	motivatio	demogr
						PA	nal	aphics,
						guideli	content	and
						nes by		BCT
						Canad		paramet
						ian		ers

						Diabet		
						es		
						Associ		
						ation		
20	Rajann	Increase	Mobile	Automa	Knowledge-	Fogg's	Goal and	PA
	a et al	PA	арр	tic	based	Behav	activity	profile,
	[20]					ior	recomme	demogr
						Model	ndation	aphics,
							and	and
							interventi	context
							on timing	ual
								informa
								tion
21	Irvine	Increase	Websit	Automa	Knowledge-	Stage	Activity	PA
	et al	PA	e and	tic	based	of	recomme	profile
	[21]		printou			Chang	ndation	and
			t			e	and	BCT
						Model	educatio	paramet
							nal	ers
		_			1 1	an mk	content	
22	Friederi	Increase	Websit	Automa	Knowledge-	SDT^{k}	Educatio	PA
	chs et	PA	е	tic	based	and	nal and	profile,
	al [22]					motiva	motivatio	demogr
						tional	nal	aphics,
						intervi	content	and
						ewing		ВСТ
								paramet
22	DII	т	CNAC	Α .	77 1 1	TEDE	3.6	ers
23	Blake	Increase	SMS	Automa	Knowledge-	TPB	Motivati	PA
	et al	PA	and	tic	based		onal	profile
	[23]		email				content	and
								BCT

								paramet
								ers
24	Coolba	Increase	Visual	Automa	Knowledge-	Ameri	Goal	PA
	ugh et	PA	feedba	tic	based	can	recomme	profile
	al [24]		ck			Colleg	ndation	
			from			e of		
			activit			Sports		
			y			Medic		
			monito			ine		
			r based			trainin		
			on			g		
			prescri			progre		
			bed PA			ssion		
			and			guideli		
			websit			nes for		
			e			sedent		
						ary		
						low-		
						risk		
25	TT	T	X47-1	A 4	171-1	adults	Caal	DA
25	Hargre	Increase	Websit	Automa	Knowledge-	PA	Goal	PA
	aves et	PA	e and	tic	based		recomme	profile,
	al [25]		messag			ne	ndation	demogr
			e				and	aphics,
							motivatio	medical
							nal	data,
							content	and
								BCT
								paramet
								ers

26	Willia	Increase	Websit	Automa	Knowledge-	Severa	Goal and	PA
	ms et al	PA	e and	tic	based	1	activity	profile
	[26]		email			clinica	recomme	and
						1	ndation	medical
						guideli		data
						nes		
27	Kwasni	Increase	Websit	Automa	Knowledge-	BCT	Educatio	PA
	cka et	PA	e and	tic	based	used	nal and	profile,
	al [27]		SMS				motivatio	demogr
							nal	aphics,
							content	ВСТ
								paramet
								ers, and
								context
								ual
								informa
								tion
28	Janols	Increase	Websit	Automa	Knowledge-	Activit	Motivati	PA
	et al	PA	e and	tic	based	y	onal	profile,
	[28]		mobile			Theor	content	demogr
			арр			y and		aphics,
						SDT		medical
								data,
								ВСТ
								paramet
								ers, and
								context
								ual
								informa
								tion

29	Ali et	Increase	Mobile	Automa	Knowledge-	Center	Goal and	PA
	al [29]	PA	арр	tic	based	for	Activity	profile,
						Diseas	recomme	demogr
						e	ndation	aphics,
						Contro	and	and
						l and	educatio	context
						Preven	nal	ual
						tion	content	informa
						guideli		tion
						nes		
30	Mistry	Increase	SMS	Automa	Knowledge-	TPB	Motivati	PA
	et al	PA	and	tic	based		onal	profile,
	[30]		email				content	demogr
							and	aphics,
							interventi	BCT
							on timing	paramet
								ers, and
								context
								ual
								informa
24	D. I.	т.	TAT 1	Δ.	TZ 1 1 .	т	A	tion
31	Peels et	Increase	Websit	Automa	Knowledge-	I-	Activity	PA
	al [31]	PA	e,	tic	based	Chang	recomme	profile,
			email,			e	ndation	demogr
			and			Model	and	aphics,
			print			,	educatio	BCT
						TTM,	nal and	paramet
						HAPA	motivatio	ers, and
						, Self-	nal	context
						regulat	content	ual
						ion		informa
						Theor		tion

						y		
32	Klein	Increase	Mobile	Automa	Knowledge-	SCT	Goal and	PA
	et al	PA	арр	tic	based system	and	activity	profile,
	[32]		and			TTM	recomme	demogr
			websit				ndation	aphics,
			e				and	ВСТ
							educatio	paramet
							nal and	ers, and
							motivatio	context
							nal	ual
							content	informa
								tion
33	Amma	Increase	Websit	Automa	Knowledge-	TPB	Educatio	PA
	nn et al	PA	e	tic	based	and	nal and	profile,
	[33]					TTM	motivatio	demogr
							nal	aphics,
							content	and
								BCT
								paramet
24	Dl4	T	747-1	A 4	17	TTA	N	ers
34	Pyky et	Increase	Websit	Automa	Knowledge-	TTM	Motivati	PA
	al [34]	PA	e	tic	based		onal	profile,
							content	demogr
								aphics,
								ВСТ
								paramet
								ers, and
								context
								ual

								informa
								tion
35	Varadh	Increase	Mobile	Automa	h	In	Goal and	PA
	arajan	PA	app	tic		associ	fitness	profile,
	et al					ation	partner	demogr
	[35]					with	recomme	aphics,
						behavi	ndation	BCT
						oral	and	paramet
						scienti	motivatio	ers, and
						sts	nal	context
							content	ual
								informa
								tion
36	Codrea	Increase	Kinect	Semiaut	Knowledge-	_	Goal and	PA
	nu et al	PA		omated	based system		activity	profile,
	[36]						recomme	demogr
							ndation	aphics,
								medical
								data,
								and
								context
								ual
								informa
								tion
37	Marsau	Increase	Websit	Semiaut	Machine	Protec	Activity	PA
	x et al	PA	e and	omated	learning:	tion	recomme	profile,
	[37]		PDF		decision	Motiv	ndation	demogr
			report		trees and	ation	and	aphics,
					expert	Theor	educatio	and
						y	nal	medical

							content	data
38	Alley	Increase	Websit	Semiaut	Knowledge-	TPB	Goal	PA
	et al	PA	e	omatic	based	and	recomme	profile,
	[38]					Elabor	ndation	demogr
						ation	and	aphics,
						Likeli	motivatio	BCT
						hood	nal and	paramet
						Model	educatio	ers, and
							nal	context
							content	ual
								informa
								tion
39	Mitchel	Increase	Websit	Semiaut	Knowledge-	SCT	Goal	PA
	l et al	PA	e,	omatic	based	and	recomme	profile,
	[39]		telepho			SDT	ndation	medical
			ne					data,
			calls					and
								BCT
								paramet
40	0 1	т	h	A .	77 1 1.	D	T	ers
40	Oostero	Increase		Automa	Knowledge-	Princi	Educatio	BCT
	m-Calo	PA+medi		tic	based system	ples of	nal and	paramet
	et al	cal				TPB	motivatio	ers
	[40]	adherenc				and	nal	
41	De	e Reduce	Websit	Automa	Knowledge-	SCT SDT,	content Activity	PA
	Cocker	workplac	e	tic	based	TPB,	recomme	profile,
	et al	e sitting	-		Juoca	and	ndation	demogr
	[41]	time :				self-	and	aphics,
	[[41]							
		increase				regulat	educatio	and

		PA				ion	nal and	BCT
						theory	motivatio	paramet
							nal	ers
							content	
42	Trianta	Rehabilit	Kinect	Automa	Knowledge-	Behav	Goal and	PA
	fyllidis	ation		tic	based	ioral	activity	profile
	et al					chang	recomme	and
	[42]					e	ndation	medical
						wheel	and	data
						and	motivatio	
						multip	nal	
						le	content if	
						clinica	required	
						1		
						guideli		
	_		_	_		nes		_
43	Dobric	Rehabilit	Smart	Semiaut	Knowledge-		Goal	PA
	an et al	ation	watch+	omated	based system		recomme	profile,
	[43]		smartp		and doctor		ndation	demogr
			hone		recommende			aphics,
			app		d target			and
					range			medical
44	Hales	Moight	Mobile	Automo	Data drivon	SCT	Eitness	data PA
44		Weight	Mobile	Automa	Data-driven	301	Fitness	
	et al	loss	app	tic	recommenda		partner	profile,
	[44]				tion system		recomme	demogr
							ndation	aphics,
							who	and
							provides	BCT
							motivatio	paramet
							nal	ers
							message	

45	Martin	Weight	Mobile	Semiaut	Manual and	Princi	Goal	PA
	et al	loss	арр	omated	knowledge-	ple of	recomme	profile,
	[45]				based system	TPB	ndation	demogr
						and	and	aphics,
						Theor	educatio	and
						y of	nal	context
						reason	content	ual
						ed		informa
						action		tion
46	Spark	Weight	SMS	Semiaut	Knowledge-	SCT	Goal and	PA
	et al	loss,		omated	based		activity	profile,
	[46]	healthy					recomme	demogr
		lifestyle:					ndation,	aphics,
		diet and					motivatio	and
		exercise					nal	context
							content,	ual
							and	informa
							interventi	tion
							on timing	
47	Kattel	Weight	Websit	Automa	Knowledge-	Stage	Motivati	PA
	mann	manage	e and	tic	based	of	onal	profile
	et al	ment	email			Chang	content	and
	[47]					e		ВСТ
						model		paramet
40	D () 1	T47 * .1 .	CMC	C	17 1 1.	D	3.4.	ers
48	Partrid	Weight	SMS	Semiaut	Knowledge-	Proces	Motivati	Demogr
	ge et al	manage	and	omated	based	s of	onal	aphics
	[48]	ment	call			chang	content	and
						e and		BCT
						SCT		paramet
								ers

49	Waltho	Weight	Websit	Automa	Knowledge-	TPB,	Educatio	PA
	uwer et	manage	e	tic	based	SCT,	nal	profile,
	al [49]	ment				TTM,	content	demogr
		:obesity				and I-		aphics,
		preventi				Chang		and
		on				e		ВСТ
						Model		paramet
								ers

^aTPB: Theory of Planned Behavior.

^bTTM: Transtheoretical Model.

^cPA: physical activity.

^dBCT: behavior change technique.

eHAPA: health action process approach.

^fAPI: Application programming interface

^gSCT: Social Cognitive Theory.

^h: Unclear.

ⁱSMS: short messaging service.

^jRNN: recurrent neural networks.

^kSDT: self-determination theory.

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