



Comparing a motivational and a self-regulatory intervention to adopt an oral self-care regimen: A two-sequential randomized crossover trial

Pempa Lhakhang, Maryam Gholami, Nina Knoll & Ralf Schwarzer

To cite this article: Pempa Lhakhang, Maryam Gholami, Nina Knoll & Ralf Schwarzer (2015) Comparing a motivational and a self-regulatory intervention to adopt an oral self-care regimen: A two-sequential randomized crossover trial, *Psychology, Health & Medicine*, 20:4, 381-392, DOI: [10.1080/13548506.2014.951368](https://doi.org/10.1080/13548506.2014.951368)

To link to this article: <https://doi.org/10.1080/13548506.2014.951368>



Published online: 22 Aug 2014.



Submit your article to this journal [↗](#)



Article views: 335



View related articles [↗](#)



View Crossmark data [↗](#)



Citing articles: 6 View citing articles [↗](#)

Comparing a motivational and a self-regulatory intervention to adopt an oral self-care regimen: A two-sequential randomized crossover trial

Pempa Lhakhang^{a*}, Maryam Gholami^{a,b}, Nina Knoll^a and Ralf Schwarzer^{c,a}

^aHealth Psychology Department, Freie Universität Berlin, Germany, Berlin, Germany;

^bInternational Max Planck Research School on The Life Course (LIFE), Max Planck Institute for Human Development, Berlin, Germany; ^cInstitute for Positive Psychology and Education, Australian Catholic University, Strathfield, Australia

(Received 16 February 2014; accepted 29 July 2014)

A sequential intervention to facilitate the adoption and maintenance of dental flossing was conducted among 205 students in India, aged 18–26 years. Two experimental groups received different treatment sequences and were observed at three assessment points, 34 days apart. One group received first a motivational intervention (intention, outcome expectancies, and risk perception, followed by a self-regulatory intervention (planning, self-efficacy, and action control). The second group received the same intervention in the opposite order. Both intervention sequences yielded gains in terms of flossing, planning, self-efficacy, and action control. However, at Time 2, those who had received the self-regulatory intervention first, were superior to their counterparts who had received the motivational intervention first. At Time 3, differences vanished as everyone had then received both interventions. Thus, findings highlight the benefits of a self-regulatory compared to a mere motivational intervention.

Keywords: self-regulation; intervention; oral self-care; self-efficacy; planning; action control

Introduction

Periodontal diseases and dental caries are among the most prevalent dental diseases affecting people worldwide (Agarwal et al., 2010). Dental flossing is the most commonly recommended adjunctive oral self-care method to prevent such diseases (Sambunjak et al., 2011). However, a large proportion of people floss their teeth less than recommended or not at all (Petersen, 2008). In India, there is lack of appropriate oral health education even among literates, and flossing is not a well-known behavior (Kumar, 2012).

Motivation or self-regulation?

Informing individuals about the benefits of flossing and the risks of poor oral self-care is not enough. They need to develop a motivation to act and self-regulatory skills to translate their intentions into action. Research has provided compelling evidence on the beneficial effects of motivation and self-regulation processes on dental flossing

*Corresponding author. Email: pempa.lhakhang@fu-berlin.de

(e.g. Schüz, Sniehotta, & Schwarzer, 2007; Schüz, Sniehotta, Wiedemann, & Seemann, 2006; Suresh, Jones, Newton, & Asimakopoulou, 2012). Moreover, a great deal of research has documented the pivotal role of planning as a self-regulatory strategy in health behavior change (for a review, see Hagger & Luszczynska, 2014). However, research has not addressed the question whether the order by which intervention components (motivation and self-regulation) are delivered, is relevant for the effectiveness of dental flossing promotion.

Perceived self-efficacy

Perceived self-efficacy is the confidence in one's ability to execute a difficult or resource-demanding behavior. The barrier here is not the technical difficulty of oral self-care behavior but rather the regular performance as an integral part of daily life which is not easy for some people. Self-efficacy predicts a range of health behaviors including oral self-care (Anagnostopoulos, Buchanan, Frousiounioti, Niakas, & Potamianos, 2011; Buglar, White, & Robinson, 2010; Jönsson, Baker, Lindberg, Oscarson, & Öhrn, 2012; Mizutani et al., 2012; Stewart, Wolfe, Maeder, & Hartz, 1996).

Beneficial effects of self-regulatory skills on dental flossing have been reported (Münster Halvari, Halvari, Bjørnebekk, & Deci, 2012; Schüz et al., 2007; Sniehotta, Araujo Soares, & Dombrowski, 2007). A combination of self-efficacy and planning is associated with higher frequency in dental self-care (Pakpour, Hidarnia, Hajizadeh, & Plotnikoff, 2012; Pakpour & Sniehotta, 2012).

Action control and planning

Self-regulatory skills such as action control facilitate adherence to dental flossing with self-monitoring being the most effective component of action control (e.g. Schüz et al., 2007; Schwarzer, Antoniuk, & Gholami, 2014; Suresh et al., 2012). Action control comprises monitoring one's progress, comparing performance with goals, and investing more effort if needed.

Action planning refers to the when, where, and how of an intended behavior whereas coping planning pertains to the anticipation of barriers and ways to overcome them. A great deal of research has documented the pivotal role of planning interventions for a variety of health behaviors (Hagger & Luszczynska, 2014; Kwasnicka, Premeaux, White, & Sniehotta, 2013).

Aims and hypotheses

It is examined whether one intervention sequence is superior to the other. According to the health action process approach (Schwarzer, 2008), a motivational intervention should precede a self-regulatory intervention because, in unmotivated individuals, first a behavioral intention needs to be formed before they can adopt and maintain the actually intended behavior. Thus, an intervention sequence starting with motivation and followed by self-regulation is the most intuitive one. However, it may be that some participants do not benefit from such a sequence because they feel patronized by the motivational messages or they perceive them as redundant, as they are already beyond that stage. In such cases, a mere self-regulatory intervention without a motivational precursor would be the better and more parsimonious option. Moreover, the intervention benefits should not only be documented by changes in dental self-care but also by changes in mindsets

as reflected by higher levels of self-efficacy, planning, and action control. Thus, the following hypotheses are put forward:

- (1) Participants will improve their oral self-care as reflected by attaining higher levels of dental flossing than before the intervention, independent of group assignment.
- (2) Participants receiving a motivational intervention prior to receiving a self-regulatory intervention (Sequence 1) will show a superior pattern of gains over time in terms of flossing, self-efficacy, planning, and action control, as compared with participants receiving a self-regulatory intervention prior to a motivational one (Sequence 2).
- (3) While participants are in the self-regulation condition, they will gain more than while being in the motivation condition, no matter at which point in time.

Method

Participants

University students ($N = 231$) were recruited from a student residence in New Delhi, India, through a notice by the student council board of the host institute with an authority permission (Table 1). Individuals who had dental treatment or made travel plans during the study time were excluded. After 7 of them did not agree to participate, the final sample consisted of 106 women and 99 men, (mean age = 20.7 years with $SD = 1.59$ and range of 18–26 years).

Research design and procedure

By cluster randomization, participants were allocated to two intervention groups using a crossover design. One group (Sequence 1) received a written motivational package after the baseline measurement (Time 1; T1) and a written self-regulatory package after the post-test (Time 2; T2). The other group (Sequence 2) was treated with a self-regulatory package after baseline measurement and after T2 with a motivational package (see Figure 1). Each intervention session lasted 20 min, and the measurement intervals were 17 days from T1 to T2, and another 17 days from T2 to Time 3 (T3). The study was conducted by the first author together with four student research assistants, who were blinded completely and, therefore, were not aware of the aims, intervention content, and any other information that could bias the results.

Measures

Dental flossing was assessed with an open answer format: “During the last week, I have flossed my teeth ... times per day”.

Table 1. Demographic characteristics of the sample (Sequence 1 = motivation → self-regulation, Sequence 2 = self-regulation → motivation).

	Sequence 1 ($n = 94$)	Sequence 2 ($n = 111$)
Age (mean and standard deviation)	19.8 (1.3)	21.5 (1.4)
Gender (N female/male)	49/45	57/54
Education (N science/commerce/humanities)	37/33/24	44/39/28
Nationality (N Indian origin/Immigrant in India)	19/75	25/86

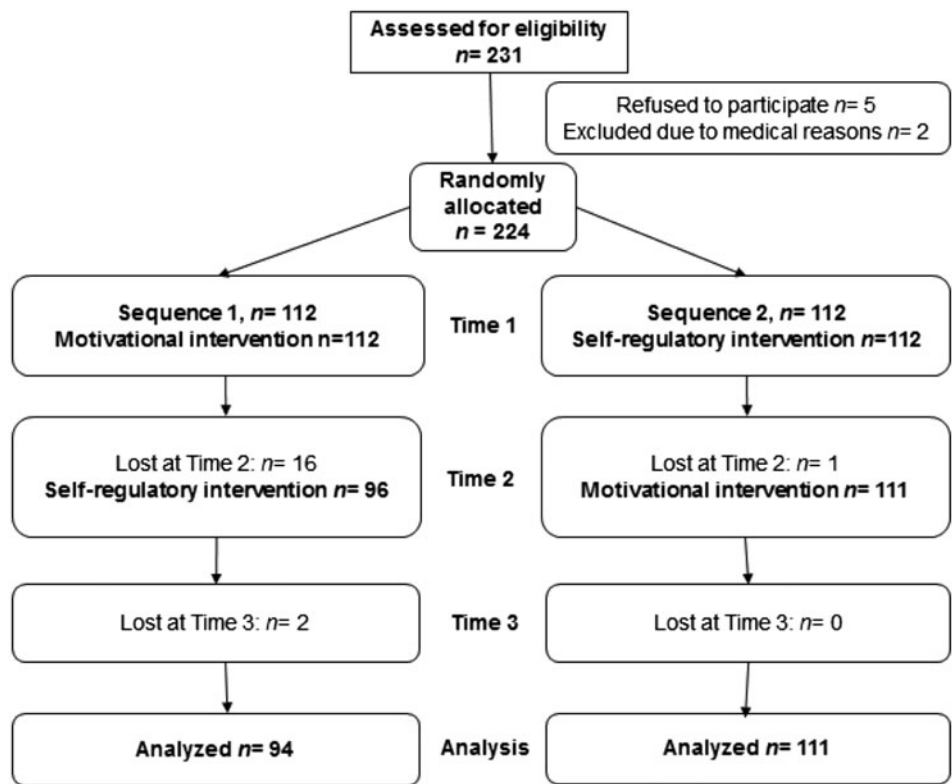


Figure 1. CONSORT flow chart.

Self-efficacy was assessed with six items ($\alpha_{T1} = .88$), ($\alpha_{T2} = .84$), and ($\alpha_{T3} = .75$), including three items for task self-efficacy (e.g. “I am confident that I can start flossing immediately on a regular basis even if it is time consuming”); and three items for coping self-efficacy (e.g. “I am confident that I can regularly floss my teeth on a long-term basis even when I cannot see any immediate effects”).

Planning was assessed with six items ($\alpha_{T1} = .80$), ($\alpha_{T2} = .87$), and ($\alpha_{T3} = .76$), three items measuring action planning (e.g. “I have made a concrete and detailed plan regarding when and where to floss my teeth”) and three items measuring coping planning (e.g. “To keep my flossing habit in difficult situations, I have made a concrete plan regarding what to do if something interferes with my flossing goal”).

Action control was assessed with two items ($\alpha_{T1} = .70$), ($\alpha_{T2} = .75$), and ($\alpha_{T3} = .52$) (e.g. “I often had my flossing intentions on my mind”).

All variables were assessed using four-point scales ranging from 1 (*not at all true*) to 4 (*exactly true*).

Interventions: self-regulatory and motivational intervention conditions

Both sequence groups received the motivational as well as the self-regulatory treatment. Intervention content is described in terms of the *Behavior Change Techniques* (BCT; Michie et al., 2013). In the *motivational condition*, participants received a package with

detailed instructions on why and how to perform the behavior (BCT 8). Risk perception: General information about the behavioral risk, and were asked to anticipate three risks of not flossing the teeth, with the example “A risk of not flossing is getting periodontal diseases” (BCTs 1 and 2). Outcome expectancies: the information about the benefits and costs of action or inaction, and were asked to specifically visualize four benefits of flossing such as “If I floss my teeth daily, then I will have healthier teeth for most of my life”. Behavioral intention: finally, they received a prompt to intention formation, encouraging the person to decide to act or set a general goal, for example, to make a behavioral resolution such as “I will floss two times every day” (BCT 4).

In the *self-regulatory condition*, participants received an intervention package that focused on self-efficacy, planning, and action control, following BCT 10, a prompt for specific goal setting, i.e. participants were asked specifically to generate plans for three occasions with specifying the frequency, time, how often, and how self-efficacious they are to floss their teeth. Moreover, they were asked to generate three critical situations which may impede the planned behavior, and coping strategies to overcome the barriers in line with BCT 5 (e.g. “if I forget to floss, then I put the dental floss next to my toothbrush”). Also, in accordance with BCT 11, they were prompted to review their goals, by considering previously set intentions. To enhance self-efficacy, they responded to questions such as “How certain are you that you can follow these plans?” Furthermore, a calendar was provided to fill in their daily flossing records (action control).

The present study provides both conditions to all participants, either in the hypothesized or in the reversed order (AB vs. BA, see Figure 2).

Analytical procedure

Repeated measures analyses of variance (ANOVA, type III tests of fixed effects) were performed with SPSS 22. The two-arm intervention (Sequence 1 vs. Sequence 2) was chosen as a between-subjects factor, whereas flossing, self-efficacy, planning, and action control served as dependent variables, measured at three points in time. Moreover, ANCOVAs were computed with sequence groups as between-subjects factor and respective outcomes of flossing, self-efficacy, planning, and action control at T2 and T3 as dependent variables with their corresponding T1 measures as covariates. All assumptions were tested beforehand such as Levine’s test of equality of error variances and Mauchley’s test of sphericity.

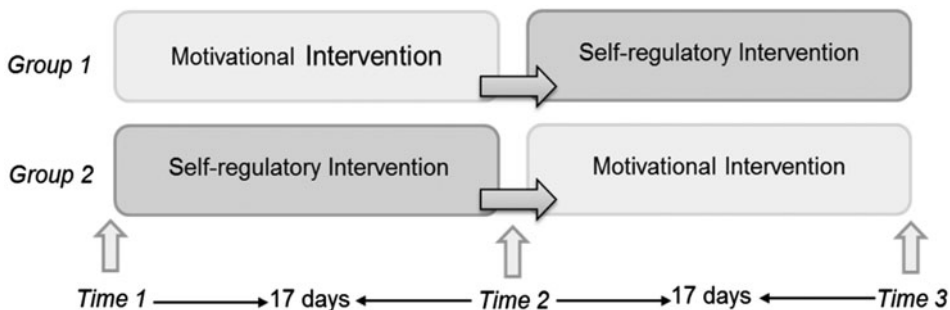


Figure 2. The treatment sequences for two intervention groups.

Results

Attrition analyses and missing values

Participants ($n = 19$) who discontinued after T2 did not differ significantly on T1 variables. They were excluded from longitudinal data analyses. Missings were below 1% for dental flossing at T1 and later (T2, T3), self-efficacy, planning, and action control at T3 had about 1% missings, and none at T1 and T2.

Randomization check

Results revealed no baseline differences (see Table 2) between the two experimental conditions regarding dental flossing, self-efficacy, and gender (all $p > .05$). At T1 a group difference was found for planning between Sequence 1 ($M = 11.06$, $SD = 3.40$) and Sequence 2 ($M = 12.28$, $SD = 3.56$), $t(203) = -2.49$, $p = .014$ and for action control with Sequence 1 ($M = 4.14$, $SD = 2.04$) and Sequence 2 ($M = 4.68$, $SD = 1.87$), $t(203) = -2.00$, $p = .047$. Analyses involving group differences following the first intervention session has used T1 measures as covariates.

Descriptive statistics

At baseline, only 6.5% of participants in both conditions reported using dental floss which indicates that there is a lack of oral hygiene even among this highly educated sample.

Intervention effects

To describe changes in the two intervention sequences across three points in time, repeated measures ANOVAs were computed for flossing and the three social-cognitive

Table 2. Means (M) and standard deviations (SD) for dental flossing, planning, self-efficacy, and action control comparison between two intervention groups at three points in time.

	Sequence 1		Sequence 2		<i>t</i>	<i>p</i>	<i>d</i>
	<i>M</i>	(SD)	<i>M</i>	(SD)			
<i>Flossing</i>							
Time 1	.17	(.87)	.09	(.35)	.91	.36	.13
Time 2	.33	(.61)	1.53	(.66)	−13.26	<.001	−1.87
Time 3	1.78	(1.09)	1.18	(.95)	4.14	<.001	.58
<i>Planning</i>							
Time 1	11.06	(3.40)	12.28	(3.56)	−2.49	.01	−.35
Time 2	10.91	(2.95)	17.12	(2.70)	−15.71	<.001	−2.21
Time 3	18.12	(3.34)	17.34	(2.50)	1.89	.06	.27
<i>Self-efficacy</i>							
Time 1	13.77	(4.91)	14.41	(4.86)	−.93	.35	−.13
Time 2	14.51	(2.34)	17.12	(3.25)	−6.49	<.001	.91
Time 3	19.19	(2.85)	18.11	(3.17)	2.54	.01	.36
<i>Action control</i>							
Time 1	4.14	(2.04)	4.68	(1.87)	−2.00	.05	−.28
Time 2	4.39	(1.87)	5.90	(1.41)	−6.57	<.001	−.92
Time 3	5.91	(1.51)	6.10	(1.18)	−.98	.33	−.14

Note: Participants of Sequence 1 received a motivational intervention before a self-regulatory intervention. Participants of Sequence 2 received a self-regulatory intervention before a motivational intervention.

variables (planning, self-efficacy, and action control). An independent samples *t*-test (two-tailed) was performed comparing the two intervention groups. Means, standard deviations, and group comparison statistics are summarized in Table 2 and displayed in Figures 3–6.

Changes in dental flossing

A repeated measures ANOVA was applied with flossing as the dependent variable at three points in time, and group as between-subjects factor. An effect of time emerged, $F(2, 396) = 160.73$, $p < .001$, $\eta^2 = .45$ and a treatment effect as well, $F(1, 198) = 6.02$, $p < .05$, $\eta^2 = .03$. Moreover, there was an interaction between treatment and time, $F(2, 396) = 76.62$, $p < .001$, $\eta^2 = .28$, (see Figure 3), participants flossed more often when treated with the self-regulatory intervention than when treated with the motivational condition.

In Intervention Sequence 1, flossing increased (.33 times flossing/day at T2 compared to 1.78 times flossing/day at T3). However, in Sequence 2, flossing showed a slight downward trend (1.53 times flossing/day at T2 compared to 1.18 times flossing/day at T3). Group differences in flossing at T2 were also tested with ANCOVA, controlling for the baseline. Sequence 2 with the self-regulation intervention had obtained a higher level of behavior change ($M = 1.53$, $SE = .06$) than Sequence 1 with motivation intervention ($M = .33$, $SE = .07$) with $F(1, 199) = 181.32$, $p < .001$, $\eta^2 = .48$. At T3, ANCOVA yielded $F(1, 198) = 17.84$, $p < .001$, $\eta^2 = .08$. Sequence 1 had higher flossing levels ($M = 1.79$, $SE = .11$) after the self-regulatory intervention than Sequence 2 ($M = 1.18$, $SD = .10$) after completing the motivational intervention.

Changes in self-efficacy

For self-efficacy, there was an overall treatment effect, $F(1, 201) = 4.18$, $p < .05$, $\eta^2 = .02$ and an effect of time, $F(2, 402) = 97.45$, $p < .001$, $\eta^2 = .33$. An interaction

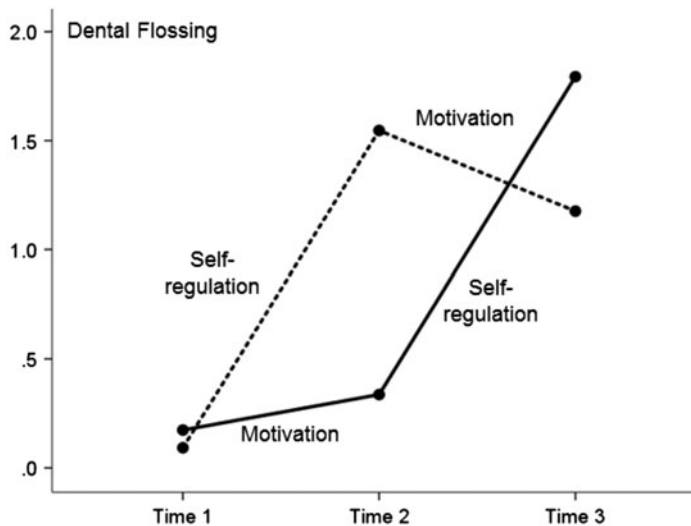


Figure 3. Dental flossing levels at three points in time in two experimental conditions (Sequence 1: first motivation, then self-regulation; Sequence 2: first self-regulation, then motivation).

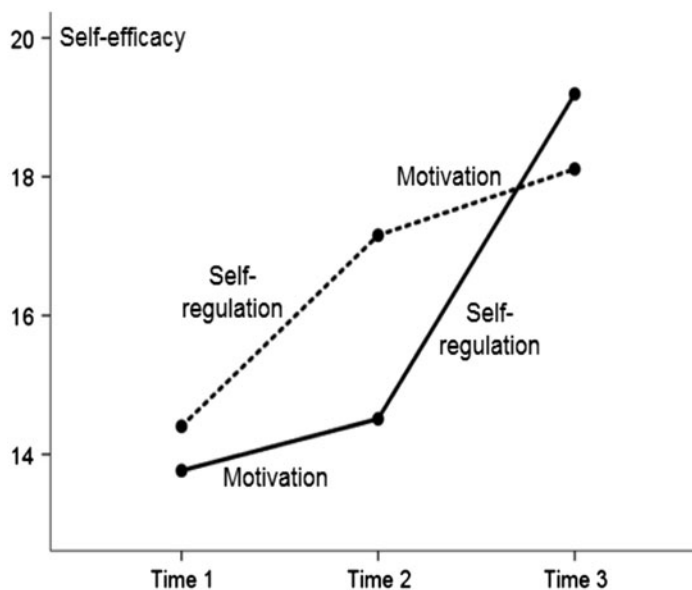


Figure 4. Self-efficacy levels (range: 1–4) at three points in time in two experimental conditions (Sequence 1: first motivation, then self-regulation; Sequence 2: first self-regulation, then motivation).

between treatment and time emerged, $F(2, 402) = 15.97$, $p < .001$, $\eta^2 = .07$. Figure 4 displays the patterns of differences in self-efficacy changes. Group differences in self-efficacy at T2 were also tested with ANCOVA, controlling for the baseline. Sequence 2 with the self-regulation intervention had obtained a higher level of self-efficacy ($M = 17.08$, $SE = .27$) than Sequence 1 with the motivation intervention ($M = 14.56$, $SE = .29$) with $F(1, 202) = 41.06$, $p < .001$, $\eta^2 = .17$. At T3, ANCOVA yielded $F(1, 200) = 16.29$, $p < .001$, $\eta^2 = .08$. Sequence 1 had higher self-efficacy levels ($M = 19.24$, $SE = .31$) after the self-regulatory intervention than Sequence 2 ($M = 18.07$, $SE = .29$) after the motivational intervention.

Changes in planning

In planning, an effect of time appeared with $F(2, 402) = 247.15$, $p < .001$, $\eta^2 = .55$ and a treatment effect, $F(1, 201) = 56.88$, $p < .001$, $\eta^2 = .22$. Moreover, a significant interaction effect between the treatment and time was found, $F(2, 402) = 88.10$, $p < .001$, $\eta^2 = .31$ (see Figure 5). Group differences in planning at T2 were also tested with ANCOVA, controlling for the baseline. Sequence 2 with the self-regulation intervention had obtained a higher level of planning ($M = 17.00$, $SE = .26$) than Sequence 1 with the motivation intervention ($M = 11.05$, $SE = .28$) with $F(1, 202) = 234.50$, $p < .001$, $\eta^2 = .54$. At T3, ANCOVA yielded $F(1, 200) = 10.48$, $p < .01$, $\eta^2 = .05$. Although Sequence 1 had higher planning levels ($M = 18.22$, $SE = .30$) after the self-regulatory intervention than Sequence 2 ($M = 17.26$, $SE = .28$) after the motivation intervention, however this difference yielded only a significance level of $p = .06$.



Figure 5. Planning levels (range: 1–4) at three points in time in two experimental conditions (Sequence 1: first motivation, then self-regulation; Sequence 2: first self-regulation, then motivation).

Changes in action control

For action control, an effect of time emerged $F(2, 402) = 61.60, p < .001, \eta^2 = .24$ and a treatment effect $F(1, 201) = 20.73, p < .001, \eta^2 = .09$. Furthermore, an interaction between treatment and time was found, $F(2, 402) = 11.59, p < .001, \eta^2 = .06$ (see Figure 6). Group differences in action control at T2 were also tested with ANCOVA, controlling for the baseline, and Sequence 2 with the self-regulation intervention had obtained a higher level of action control ($M = 5.85, SE = .15$) than Sequence 1 with the motivation intervention ($M = 4.46, SE = .17$) with $F(1, 202) = 38.29, p < .001, \eta^2 = .16$. At T3, ANCOVA yielded $F(1, 200) = .48, p = .49$. Sequence 1 had the same level of action control ($M = 5.97, SE = .14$) after the self-regulatory intervention as Sequence 2 ($M = 6.05, SE = .13$) after the motivational intervention.

Discussion

This study has examined the effects of an oral self-care intervention in different sequences. In Sequence 1, participants received first the motivation, then the self-regulation intervention. In Sequence 2, they received first the self-regulation, then the motivation intervention. Pre-post comparisons have shown that both groups of participants have improved their oral self-care as reflected by attaining higher levels of dental flossing (Hypothesis 1 supported). They also showed a general increase in self-efficacy, planning, and action control. However, participants in Sequence 1 did not demonstrate a superior pattern of gains over the entire time period in terms of flossing, self-efficacy, planning, and action control, as compared with participants in Sequence 2 (Hypothesis 2 rejected). While participants were in the self-regulation condition, they gained more in terms of the four outcome variables than while being in the motivation condition (Hypothesis 3 supported).

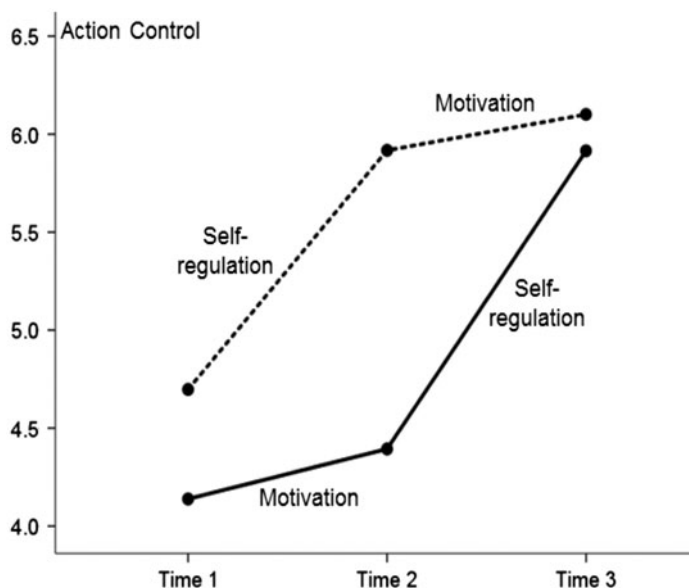


Figure 6. Action control levels (range: 1–4) at three points in time in two experimental conditions (Sequence 1: first motivation, then self-regulation; Sequence 2: first self-regulation, then motivation).

The main differences emerged at T2 which was the point in time when both groups were exposed either to the motivational or the self-regulatory one. At T2, there was a clear superiority of the self-regulatory intervention in terms of all four outcomes. This substantial group difference vanished at T3, after all participants had been exposed to both kinds of interventions.

This research demonstrates that a motivational intervention in itself is not sufficient for behavior change. The more successful approach lies in the acquisition of self-regulatory skills and the development of confidence in one's agency. In the present context, this could be done even without any motivational preludes. Combining self-efficacy, planning, and action control allowed to build up a self-regulatory process that was documented in terms of flossing frequency and also in terms of the indicators of the three intervention ingredients.

Although the health promotion program as a whole has turned out to be effective which justifies its use, it does not allow to identify active ingredients. Another limitation was the lack of objective measures to assess progress in flossing. Assessments were self-reported, and dental flossing was measured retrospectively. One could use ongoing behavioral assessments such as a dental calendar that allow for constant record keeping (Schüz et al., 2007), but here the calendars were used as one of the intervention components under the self-regulatory condition but not as a daily assessment tool.

As the baseline weekly flossing rate was almost zero, it was assumed that almost all participants were initially unmotivated to adopt flossing. Therefore, no distinction was made among participants in terms of intenders, non-intenders, and actors of flossing. Future work should consider a segmentation of the audience in terms of non-intenders, intenders, and actors (Schwarzer, 2008) and matched versus mismatched interventions.

Theory-based intervention packages were found to work in one sequence as well as in the other although only the self-regulatory intervention made the difference. However, the motivational intervention may have not been strong enough to show its potential, and future research may want to build more powerful packages along with more measurement points in time to better monitor the effects at each stage. Overall, this study used a theory-based intervention design and has explored in a unique way the sequencing of different health behavior change techniques in the context of oral self-care, using dental flossing as an example. Thus, the present data may contribute to research on the sequencing of health behavior intervention components in general.

Acknowledgment

Pempa Lhakhang has received a DAAD (German Academic Exchange Service) stipend.

References

- Agarwal, V., Khatri, M., Singh, G., Gupta, G., Marya, C.M., & Kumar, V. (2010). Prevalence of periodontal diseases in India. *Journal of Oral Health and Community Dentistry*, 4, 7–16. Retrieved from <http://www.johcd.org/Issues-Nov-2010.html>
- Anagnostopoulos, F., Buchanan, H., Frousiounioti, S., Niakas, D., & Potamianos, G. (2011). Self-efficacy and oral hygiene beliefs about toothbrushing in dental patients: A model-guided study. *Behavioral Medicine*, 37, 132–139. doi:10.1080/08964289.2011.636770
- Buglar, M.E., White, K.M., & Robinson, N.G. (2010). The role of self-efficacy in dental patients' brushing and flossing: Testing an extended health belief model. *Patient Education and Counseling*, 78, 269–272. doi:10.1016/j.pec.2009.06.014
- Hagger, M.S., & Luszczynska, A. (2014). Implementation intention and action planning interventions in health contexts: State of the research and proposals for the way forward. *Applied Psychology: Health and Well-Being*, 6, 1–47. doi:10.1111/aphw.12017
- Jönsson, B., Baker, S.R., Lindberg, P., Oscarson, N., & Öhrn, K. (2012). Factors influencing oral hygiene behaviour and gingival outcomes 3 and 12 months after initial periodontal treatment: An exploratory test of an extended Theory of Reasoned Action. *Journal of Clinical Periodontology*, 39, 138–144. doi:10.1111/j.1600-051X.2011.01822.x
- Kumar, S. (2012). Oral hygiene awareness among two non professional college students in Chennai, India – A pilot study. *Advances in Life Science and Technology*, 5, 31–36.
- Kwasnicka, D., Presseau, J., White, M., & Sniehotta, F. (2013). Does planning how to cope with anticipated barriers facilitate health-related behavior change? A systematic review. *Health Psychology Review*, 7, 129–145. doi:10.1080/17437199.2013.766832
- Michie, S., Richardson, M., Johnston, M., Abraham, C., Francis, J., Hardeman, W., & Eccles, M.P. (2013). The behavior change technique taxonomy (v1) of 93 hierarchically clustered techniques: Building an international consensus for the reporting of behavior change interventions. *Annals of Behavioral Medicine*, 46, 81–95. doi:10.1007/s12160-013-9486-6
- Mizutani, S., Ekuni, D., Furuta, M., Tomofuji, T., Irie, K., Azuma, T., ... Morita, M. (2012). Effects of self-efficacy on oral health behaviours and gingival health in university students aged 18 or 19 years old. *Journal of Clinical Periodontology*, 39, 844–849. doi:10.1111/j.1600-051X.2012.01919.x
- Münster Halvari, A.E., Halvari, H., Bjørnebekk, G., & Deci, E.L. (2012). Self-determined motivational predictors of increases in dental behaviors, decreases in dental plaque, and improvement in oral health: A randomized clinical trial. *Health Psychology*, 31, 777–788. doi:10.1037/a0027062
- Pakpour, A.H., Hidarnia, A., Hajizadeh, E., & Plotnikoff, R.C. (2012). Action and coping planning with regard to dental brushing among Iranian adolescents. *Psychology, Health & Medicine*, 17, 176–187. doi:10.1080/13548506.2011.596551
- Pakpour, A.H., & Sniehotta, F.F. (2012). Perceived behavioural control and coping planning predict dental brushing behaviour among Iranian adolescents. *Journal of Clinical Periodontology*, 39, 132–137. doi:10.1111/j.1600-051X.2011.01826.x

- Petersen, P.E. (2008). World Health Organization global policy for improvement of oral health- World Health Assembly 2007. *International Dental Journal*, 58, 115–121. PMID:18630105.
- Sambunjak, D., Nickerson, J.W., Poklepovic, T., Johnson, T.M., Imai, P., Tugwell, P., & Worthington, H.V. (2011). Flossing for the management of periodontal diseases and dental caries in adults. *Cochrane Database of Systematic Reviews*, Issue 12, Art. No.: CD008829. doi:[10.1002/14651858.CD008829.pub2](https://doi.org/10.1002/14651858.CD008829.pub2)
- Schüz, B., Sniehotta, F.F., & Schwarzer, R. (2007). Stage-specific effects of an self-monitoring intervention on dental flossing. *Health Education Research*, 22, 332–341. doi:[10.1093/her/cyl084](https://doi.org/10.1093/her/cyl084)
- Schüz, B., Sniehotta, F.F., Wiedemann, A., & Seemann, R. (2006). Adherence to a daily flossing regimen in university students: Effects of planning when, where, how and what to do in the face of barriers. *Journal of Clinical Periodontology*, 33, 612–619. doi:[10.1111/j.1600-051X.2006.00967.x](https://doi.org/10.1111/j.1600-051X.2006.00967.x)
- Schwarzer, R. (2008). Modeling health behavior change: How to predict and modify the adoption and maintenance of health behaviors. *Applied Psychology: An International Review*, 57, 1–29. doi:[10.1111/j.1464-0597.2007.00325.x](https://doi.org/10.1111/j.1464-0597.2007.00325.x)
- Schwarzer, R., Antoniuk, A., & Gholami, M. (2014). A brief intervention changing oral self-care, self-efficacy, and self-monitoring. *British Journal of Health Psychology*. doi:[10.1111/bjhp.12091](https://doi.org/10.1111/bjhp.12091)
- Sniehotta, F.F., Araujo Soares, V., & Dombrowski, S.U. (2007). Randomized controlled trial of a one-minute intervention changing oral self-care behavior. *Journal of Dental Research*, 86, 641–645. doi:[10.1177/154405910708600711](https://doi.org/10.1177/154405910708600711)
- Stewart, J.E., Wolfe, G.R., Maeder, L., & Hartz, G.W. (1996). Changes in dental knowledge and self-efficacy scores following interventions to change oral hygiene behavior. *Patient Education and Counseling*, 27, 269–277. doi:[10.1016/0738-3991\(95\)00843-8](https://doi.org/10.1016/0738-3991(95)00843-8)
- Suresh, R., Jones, K., Newton, J.T., & Asimakopoulou, K. (2012). An exploratory study into whether self-monitoring improves adherence to daily flossing among dental patients. *Journal of Public Health Dentistry*, 72, 1–7. doi:[10.1111/j.1752-7325.2011.00274.x](https://doi.org/10.1111/j.1752-7325.2011.00274.x)