Journal of Sport & Exercise Psychology, 2022, 44, 103-115
https://doi.org/10.1123/jsep.2021-0018

Human Kinetics
ORIGINAL RESEARCH

Effectiveness of Individual Exercise and Sport Counseling Based on Motives and Goals: A Randomized Controlled Trial

Nina Schorno, Vanessa Gut, Achim Conzelmann, and Julia Schmid
Institute of Sport Science, University of Bern, Bern, Switzerland

This study tested the effectiveness of individual exercise and sport counseling in a nonclinical setting. The **CO**unseling based on **M**otives and goals in **E**xercise and spor**T** (COMET) approach focuses on individual motives and goals and aims to identify suitable activities. Participants experience different exercise and sport activities and reflect on them with a counselor, who applies motivational interviewing. A stratified randomized controlled design with 129 people was used. The intervention group took part in a counseling event, which included feedback on motives and goals, trial exercise and sport sessions, and structured reflection. Four weeks later, members of the group got a telephone booster. The control group received minimal intervention as written information. Results show that the counseling promoted motivational competence ($\eta^2 = .16$), physical activity–specific self-control ($\eta^2 = .08$), and the weekly volume of exercise and sport ($\eta^2 = .15$), whereas it did not influence self-concordance. Further studies can investigate whether the COMET approach is also effective in other settings.

Keywords: counseling, motivation, motivational interviewing, needs, physical activity, preferences

The World Health Organization (WHO, 2018) guides nations to implement actions that support people to become more physically active. The overreaching goal is that many benefit from the health effects of physical activity (PA), for example, the prevention of obesity, cancer, coronary heart disease, or mental health conditions (McTiernan et al., 2019; Reiner et al., 2013). In the global action plan on PA, the WHO (2018) highlights individual counseling as one important promotion strategy.

Different counseling concepts on PA are available (for an overview see Supplementary Material S1 [available online]). Although almost all of these concepts include behavior change techniques (Michie et al., 2013), such as developing action and coping plans, which are effective in the promotion of exercise and sport behavior (e.g., Fischer, Kreppke, et al., 2019; van Hoecke et al., 2014), the topic of individual preferences has received less consideration. The majority of the counseling concepts we found that take preferences into account do so rather marginally (Chemtob et al., 2019; Fortier et al., 2011; Fuchs et al., 2011; Kolt et al., 2007). For instance, in the study by Fuchs et al. (2011), individuals had to check on a worksheet whether a planned activity corresponds to their interests. This topic, however, was not explored further. Two counseling concepts that we found do focus more extensively on preferences (Chemtob et al., 2019; Fortier et al., 2011). For example, in the study by Fortier et al. (2011), counselors recorded each individual's preferences and discussed potentially suitable exercise and sport activities with them. Nonetheless, participants' experiences were limited to the counseling only, without the opportunity to try out any PA and reflect on it in the counseling. Yet, it is precisely this interweaving of practical experience and reflection in terms of time and content that we propose has the potential to promote an individual's learning (Schön, 1983).

The fact that preferences are not thematized more intensively in existing counseling concepts is surprising as the literature highlights the importance of addressing preferences in PA promotion (Whitlock et al., 2002; WHO, 2018). It is (implicitly) assumed that people are more likely to maintain an activity for a longer period of time if they perceive it as suitable and pleasurable. Empirical studies do, in fact, confirm this assumption (Klusmann et al., 2016; Schmid et al., 2021; Sudeck & Conzelmann, 2011).

To fill the aforementioned gap, Schmid et al. (2020) developed the **CO**unseling based on **M**otives and goals in **E**xercise and spor**T** (COMET) approach, which considers an individual's preferences comprehensively and systematically. It aims to identify suitable types of activities for these individuals by standardized assessing and reporting back their motives and goals, giving them diverse exercise and sport experiences, and finally, by taking the time to reflect on them in a structured way immediately after. The COMET approach focuses on exercise and sport, two similar subsets of PA. Both are planned, structured, and performed during leisure time (Strath et al., 2013). Exercise and sport activities are very diverse. Consequently, preferences may play a particularly significant role here.

A recent implementation study revealed that the COMET approach can be successfully applied in a nonclinical setting (Schmid et al., 2020). Participants (overall sample[1]: $N = 94$, $M_{age} = 40.65$, 69% women, 66% 0–74 min exercise and sport/week) were satisfied with the counseling overall, indicating a good acceptability of the approach. They also reported in qualitative interviews that the counseling helped them notice their preferences. Furthermore, implementation fidelity was good, meaning that counselors were able to follow closely the semistandardized protocol (see Schmid et al., 2020 for details about factors that influence implementation fidelity). To complement existing research, the present study aims to test the effectiveness of the COMET approach using a randomized controlled trial.

Schorno (nina.schorno@unibe.ch) is corresponding author, https://orcid.org/0000-0003-0415-6726

The COMET approach seeks to promote motivation, volition, and exercise and sport behavior. In terms of motivation, it focuses on *motivational competence* (MC; Rheinberg & Engeser, 2018), which refers to "a person's ability to reconcile current and future situations with their activity preferences" (Rheinberg & Engeser, 2010, p. 532). In the context of exercise and sport, MC consists of three different components: (a) A person is aware of their own motives and goals. (Explicit) motives are defined as self-attributed needs and conscious goals (Heckhausen & Heckhausen, 2018). This indicates that a person knows what is important for him/her when active. For example, one is looking to be in contact with other people or wants to reduce stress. (b) A person is able to correctly evaluate activities in terms of their incentives. This implies that an individual knows what to expect in specific exercise and sport activities. For example, as a member of a basketball team, one can spend time with other people or one can relax while hiking. (c) A person can choose an activity that corresponds to their motives and goals or arrange and realize the same accordingly. For example, one can go jogging outdoors instead of on the treadmill to reduce stress (Rheinberg & Engeser, 2018; Schorno et al., 2021). MC is positively associated with exercise and sport behavior (Schorno et al., 2021). Furthermore, the counseling addresses *self-concordance* (Sheldon & Elliot, 1999), which is defined as how well a chosen goal matches one's own interests and values. Self-concordance represents a continuum and consists of four motivation modes: In an intrinsic motivation mode, a person wants to be active because it gives pleasure and is perceived as inherently interesting. In an identified motivation mode, a person wants to be active and shares a sense of choice and belief that exercising or doing sport leads to important outcomes. In an introjected motivation mode, a person wants to be active to avoid internally imposed anxiety and guilt. And finally, in the extrinsic motivation mode, a person wants to be active because of a positive consequence or external pressure (Sheldon & Elliot, 1999). Promoting the intrinsic and the identified motivation modes is essential because these modes are positively related to exercise and sport behavior (Teixeira et al., 2012). In terms of volition, the COMET approach focuses on *PA-specific self-control* (SC; Sudeck & Pfeifer, 2016), which refers to the ability to transfer intentions into actual behavior (Gollwitzer & Oettingen, 2016). PA-specific SC includes cognitive strategies, such as developing action and coping plans (Gollwitzer & Oettingen, 2016). Based on the theoretical considerations and empirical studies presented earlier, it is assumed that increased MC, self-concordance, and PA-specific SC all lead to more regular exercise and sport behavior (Bélanger-Gravel et al., 2013; Fuchs et al., 2016; Rheinberg & Engeser, 2010). The COMET approach addresses these four different outcomes, whereof MC, self-concordance, and PA-specific SC are considered primary outcomes and exercise and sport volume (in minutes per week) a secondary outcome.

The COMET approach is based on the idea of "the fit," which states that the fit between a person's motives (e.g., social contact) and an activity's incentive (e.g., having the opportunity to socialize with others while doing partner exercises) leads to positive outcomes, such as affective well-being and maintenance in exercise and sport behavior (van Vianen, 2018). In adulthood, motives and goals in exercise and sport vary greatly interindividually (Lehnert et al., 2011; Schmid et al., 2018). It is assumed that a person is motivated not by one sole motive and goal but by several, working simultaneously. Thus, each person has an individual motive and goal profile, illustrating what is important to a person and what is not. Sudeck et al. (2011) identified typical motive and goal profiles (a so-called motive-based type of sport person; see also Lindwall et al., 2016). Empirical studies show that an exercise and sport program that fits an individual's motive and goal profile fosters affective well-being during and after PA (Sudeck & Conzelmann, 2011).

However, a suitable activity should not be simply predetermined without discussion. In counseling, counselor and participant work together. Therefore, it is not a matter of telling participants what to do but of jointly searching for suitable activities. Here, motivational interviewing (MI; Miller & Rollnick, 2013) offers a theoretical–practical concept that emphasizes this partnership-based approach in conversations. Thereby, individuals are considered experts about themselves; the motivation to change is elicited from the individual and not imposed from without (Rubak et al., 2005). MI consists of relational techniques, on the one hand, wherein the focus is on the interpersonal style, which encourages people to express or even discover their ideas. It increases their self-awareness and facilitates autonomous decision making (Gillison et al., 2019; Vansteenkiste & Sheldon, 2006). In the present study, three relational techniques are relevant: asking open-ended questions that cannot be answered with a limited response, making reflective statements by repeating back what a person has said, and finally, making summary statements by pulling everything together. On the other hand, MI consists of content-based techniques wherein the imparting of knowledge and skills to promote commitment to behavior change is central. Here, both the change plan and the so-called troubleshooting are crucial. The change plan helps to implement activities in everyday life by specifying which activity will be carried out where and when. Troubleshooting identifies potential barriers and defines strategies to overcome. These two content-based techniques have a large overlap with behavior change techniques: The change plan is comparable with action planning, whereas troubleshooting is comparable with coping planning (Hardcastle et al., 2017; Michie et al., 2013). MI has proven to be an effective method to promote (intrinsic) motivation and exercise and sport behavior (e.g., Gillison et al., 2019; O'Halloran et al., 2014).

According to this theoretical background, the COMET approach encompasses six counseling elements, which are thought to address the aforementioned outcomes (Table 1 for an overview).

To foster the different components of (a) *MC*, the individual motive and goal profile needs to be assessed and feedback provided (Counseling Elements 1 and 2). Furthermore, diverse exercise and sport experiences need to be gained to evaluate incentives of different activities (Counseling Element 3). Based on both the motive and goal profile and the structured reflection on the exercise and sport experiences, suitable exercise and sport activities may be found (Counseling Element 4; Rheinberg & Engeser, 2018; Schorno et al., 2021). To promote (b) *self-concordance*, relational MI techniques need to be used (Counseling Elements 2, 4, 5, and 6; Hardcastle et al., 2017). To foster (c) *PA-specific SC*, the content-based MI techniques are relevant. A specific change plan needs to be established (Counseling Element 5; Bélanger-Gravel et al., 2013; Hardcastle et al., 2017). In addition, troubleshooting needs to be applied (Counseling Element 6; Hardcastle et al., 2017).

The current study aims to examine the effectiveness of the COMET approach over time. It is hypothesized that participants who undergo the intervention of the COMET approach (intervention group: IG) will show (a) higher MC, (b) higher self-concordance, and (c) higher PA-specific SC than people who did not participate in the counseling (minimal-intervention control group: MICG). Furthermore, it is expected that the IG will show (d) a larger volume of exercise and sport than the MICG.

Table 1 Counseling Elements of the COMET Approach and Associated Outcomes

	Counseling element with formal description	Procedure	Duration	Primary outcomes	Secondary outcome
1	Assessing relevant personal characteristics: • Motives and goal contents in exercise and sport • Current and past exercise and sport behavior	Computer-based survey, one-to one conversation, structured interview	10 min	MC	Exercise and sport volume (min/wk)
2	Explanation of and structured reflection on: • Individual motive and goal profile • Motive-based types of sport person	One-to-one conversation semistructured interview	20–25 min	Self-concordance; MC	
3	Experiencing diverse exercise and sport activities: • Three different exercise and sport trial sessions with different incentives Assessing exercise and sport experiences before, during, and after each session: • Exercise and sport experiences following motive and goal contents • Enjoyment and affective states, among others	Guided group sessions (8–12 individuals per group), smartphone-based survey	110 min (three exercise and sport sessions of 30 min each, 10-min break between sessions)	MC	
4	Structured reflection and shared discussion about: • Exercise and sport experiences during sessions • Suitable exercise and sport activities • Local exercise and sport providers	One-to-one conversation semistructured interview	20 min	Self-concordance; MC	
5	Structured reflection and shared decision making about: • Concrete change plan			Self-concordance; PA-specific SC	
6	Structured reflection and shared discussion about (intervention "booster" by telephone call): • Implementation of the change plan in everyday life • If appropriate: adaptation of change plan based on exercise and sport experiences • If appropriate: identification of potential barriers and strategies to overcome them	One-to-one conversation on the phone, semistructured interview	20 min	Self-concordance; PA-specific SC	

Note. COMET = **CO**unseling based on **M**otives and goals in **E**xercise and spor**T**; MC = motivational competence; PA = physical activity; SC = self-control.

Methods

Study Design and Procedure

The present study is based on a stratified randomized controlled design with two groups (see Supplementary Material S2 [available online], CONSORT checklist). The stratification was done with three groups based on the habitual exercise and sport volume (inactive, 1–60 min, 61–120 min) indicated at registration. Each participant was randomly assigned to either the IG or the MICG 1 month before the study. The allocation was concealed. Together with an independent person, the first author performed randomization, using randomizer.org.

The study lasted 14 weeks (pretest assessment t_1 to follow-up assessment t_3), starting end of May 2019 and finishing end of August 2019. The intervention was delivered in two parts (Figure 1). The IG took part in a counseling event (consisting of Counseling Elements 1–5; Table 1) at the buildings and gym of the Institute of Sport Science at the University of Bern. At the same time, the MICG received information in writing about exercise and sport. One month later, the IG got a telephone call as an intervention "booster" (consisting of Counseling Element 6; Table 1), whereas the MICG got an organizational telephone call. Questionnaires were filled out in both groups at three assessment times (t_1–t_3; Figure 1): pretest assessment before the start of the intervention (t_1), posttest assessment 4 weeks after the counseling event and before the telephone booster (t_2), and a follow-up assessment 10 weeks after the telephone booster (t_3). The 4 weeks between t_1 and t_2 were chosen so that the IG had time to implement the contents of the counseling event. The 10 weeks between t_2 and t_3 were chosen to analyze medium-term effects and to prevent dropouts in the MICG due to long waiting times. After finishing the follow-up assessment, the MICG received the same counseling as the IG to thank them for their participation. This study was registered with Open Science Framework (osf.io/4kw68).

Sample

Adhering to the results of previous studies (e.g., Orrow et al., 2012), the sample size was calculated *a priori* using G*Power (Faul et al., 2007) for repeated-measures analysis of variance (ANOVA) with between factors (power = 0.95, $\alpha = .05$, effect size = 0.25, number of groups = 2, repetitions = 3). An approximate total sample size of $n = 142$ was needed. In the aforementioned implementation study (Schmid et al., 2020), there was a dropout of about 10%–15%. As a similar rate could be assumed for the present study, additional people (at least 21) were accordingly included for randomization.

Participants were first recruited via a health insurance's online media (newsletter, homepage, and social media) and print media (magazine, flyer, and media release), second via service companies' health management platforms, and third with an online advertisement in a newspaper. Recruitment took place from 3 months before randomization in January to end of April 2019.

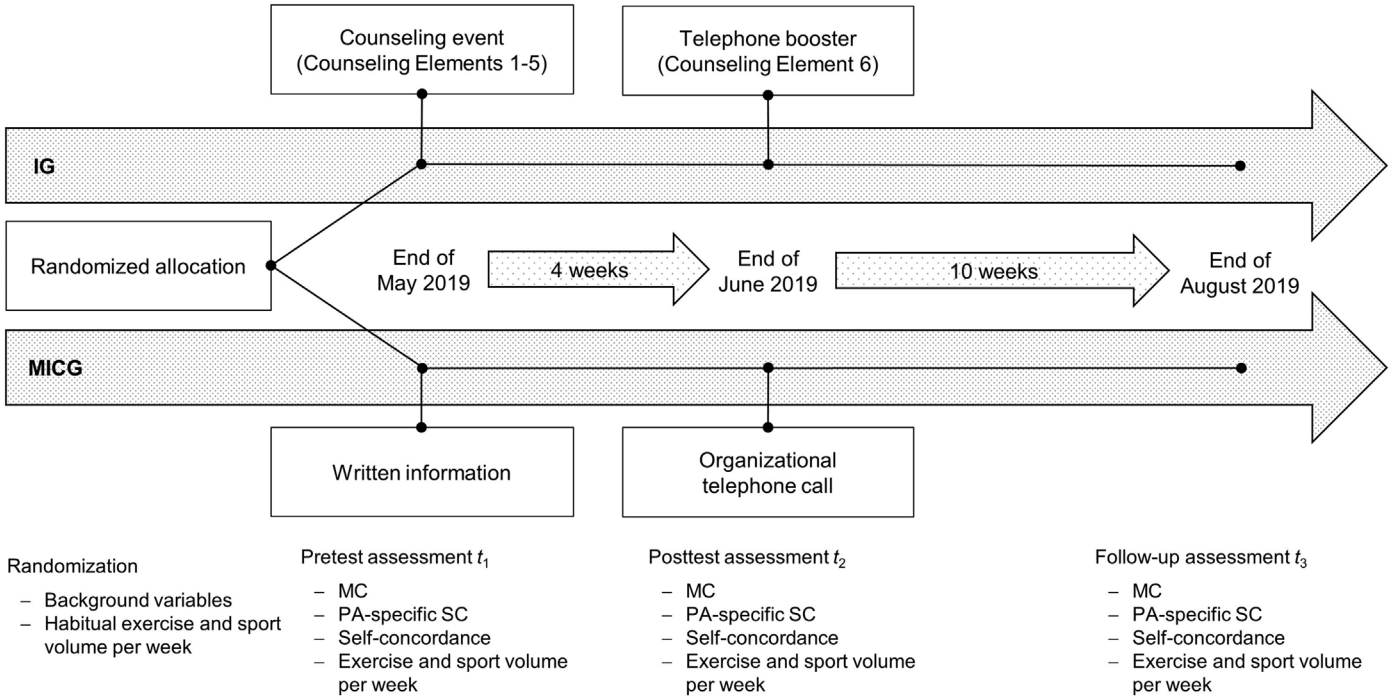

Figure 1 — Intervention procedure and time points of assessments. *Note*. IG = intervention group; MC = motivational competence; MICG = minimal-intervention control group; PA = physical activity; SC = self control.

All $n = 248$ registered people filled out a screening questionnaire to assess background variables (e.g., age, gender). Furthermore, the screening included the European Health Interview Survey-Physical Activity Questionnaire (Finger et al., 2015) to assess their habitual exercise and sport per week. People with a current habitual exercise and sport volume of less than 120 min/week were eligible to participate in the study, assuming that these people were exercising a maximum of twice a week. Further inclusion criteria were age—between 20 and 70 years old—and literacy in German. When people were unable to give informed consent or participate in another exercise-related study, they were excluded. Finally, 169 participants were judged to be eligible and randomly allocated to the IG or MICG (Figure 2).

Several people dropped out of the study. Some signed off within 7 days before the start of the study but after randomization ($n = 29$), giving the following reasons for their withdrawal: (a) having to work short term on the intervention day, (b) being on vacation on the intervention day, and (c) something unexpected happening in the family (e.g., death of a family member). In addition, $n = 10$ people did not appear at the counseling event without notice (no shows). Consequently, although they had been randomized, these people ($n = 39$) had to be excluded from the analysis because there were no data on them at any of the assessment times (t_1–t_3). After this exclusion, the entire analysis was handled according to intention-to-treat (Figure 2). Participants who dropped out after randomization did not differ significantly from the rest of the sample in terms of age, $t(166) = -.293$; $p = .770$, gender, $\chi^2(1) = .778$; $p = .378$, and habitual exercise and sport per week, $t(166) = -.867$; $p = .387$.

All participants signed the written consent form. The Ethics Committee of the Faculty of Human Sciences of the University of Bern approved the study design and intervention (number: 2018-11-00004).

Exercise and Sport Counseling Intervention

The exercise and sport counseling consisted of six elements. It lasted, overall, about 3 hr in person. In the following, the single counseling elements are described in more detail (see Schmid et al., 2020). The following numbers correspond to the numbers of the counseling elements in Table 1.

1. In the beginning, each participant's current and past exercise and sport behavior was assessed (Fuchs et al., 2015) as were their individual motives and goals in exercise and sport (Lehnert et al., 2011; Schmid et al., 2018). The collected data were then used to form individual feedback on the motive and goal profile (see Supplementary Material S3 [available online]) and the motive-based type of sport person assigned (Sudeck et al., 2011).
2. Counselors explained these data and prompted participants to reflect on them. For this, counselors asked open-ended questions (e.g., To what extent does this motive and goal profile match your personal impression?) and used reflective statements (e.g., paraphrasing participants' comments).
3. Afterward, participants gained diverse exercise experiences in three trial exercise and sport sessions. The six existing groups were balanced in terms of age. Sessions were similarly structured (warm-up, main part, and cooldown) but addressed different incentives (figure and health vs. social contact and competition vs. relaxation and aesthetic movement; see Supplementary Material S4 [availabe online]). Before, during, and after each session, participants had to answer short questions on smartphones (e.g., about affective well-being, exercise, and sport experiences following motive and goal contents; Lehnert et al., 2011; Schmid et al., 2018).

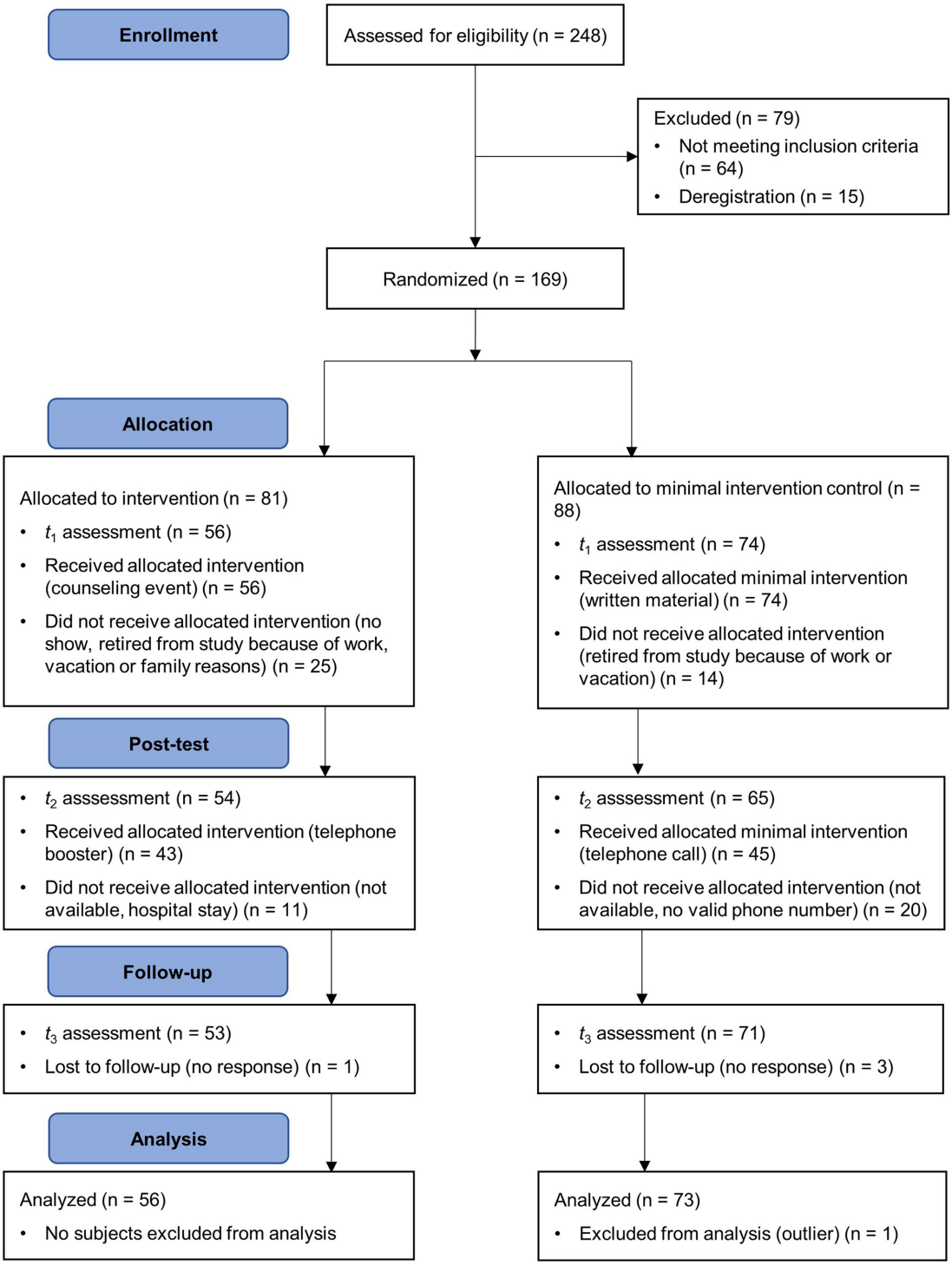

Figure 2 — CONSORT flow diagram of participants.

4. The counseling event continued with the same counselor as before, who prompted participants to reflect on the incentives of the exercise and sport activities they had just experienced (e.g., Which exercise session did you like the most and which the least? Why?). Furthermore, the counselors and participants looked at the data from the previous smartphone survey and discussed it (e.g., To what extent do the data about affective well-being represent your personal impression?). Based on this shared discussion, they worked together to deduce potentially suitable exercise and sport activities. The final advice was also inspired by the work of Sudeck and Conzelmann (2011), who identified suitable exercise and sport activities for each motive-based type of sport person.
5. Counselors then assisted participants in developing a concrete change plan (e.g., Which activity will I do when, where, and

how often?). They agreed jointly that participants would implement this change plan in the coming weeks until the telephone call. To round up the counseling event, the counselors gave a summary statement about each of the counseling elements and the jointly elaborated components contained therein.

6. Four weeks after the counseling event, participants got a telephone call, which served as a booster. Reflecting on the experiences they had in the meantime was key. The counselors asked participants to what extent they had been able to implement the change plan in their everyday life and what experiences they had. Depending on the answers, the change plan was adapted jointly. Furthermore, when deemed appropriate, counselors guided participants through the troubleshooting (e.g., identify the barrier: it is raining; look for the strategy to overcome it: I wear my rain jacket).

The intervention was realized by 16 counselors ($M_{age} = 25.81$ years, $SD_{age} = 3.08$ years, range: 23–35 years, 56% female, all exercise and sport scientists). They were all educated as counselors in a training course at the University of Bern, which lasted 10×90 min (for details see Schmid et al., 2020). Counselors were given a handbook explaining the goal and theoretical background of the COMET approach and a semistandardized counseling protocol (available on request, from the last author), complete with the specific procedure and key sentences of the one-to-one conversations (e.g., open-ended questions).

Minimal-Intervention Control

At the time of the counseling event (t_1), participants allocated to the MICG received information about exercise and sport by email (see Supplementary Material S5 [available online]). Motives and goals in exercise and sport were described, and a change plan to implement activities in everyday life was briefly explained. The content was similar to the IG counseling event, but the information was not individualized, and there was no face-to-face contact. To keep the conditions of the experiment the same for all, the participants received a telephone call with organizational information (e.g., asking whether they had any questions about the date and place of the upcoming counseling event). This call happened at the same time as the telephone booster to the IG participants (t_2). When the study was finished, participants allocated to the MICG were invited to attend the counseling to thank them for their participation.

Outcome Measures

All outcome measures were collected online three times during the study (Figure 1). In addition, demographic details were elicited at the pretest assessment (t_1; e.g., education, height, weight).

MC was assessed with the 4-item scale developed and validated by Schorno et al. (2021). Statements were rated on a 5-point Likert scale ranging from 1 (*does not apply at all*) to 5 (*applies exactly*): for example, "I know exactly what is important for me in an exercise and sport activity so that I like it" or "I find it very easy to assess what characterizes different exercise and sport activities." Cronbach's alpha was acceptable to good (t_1: $\alpha = .79$, t_2: $\alpha = .82$, t_3: $\alpha = .88$).

PA-specific SC was assessed with the validated three-item scale by Sudeck and Pfeifer (2016). Statements such as "If I have planned to exercise, I generally follow through on this plan" were rated on a 5-point Likert scale ranging from 1 (*does not apply at all*) to 5 (*applies exactly*). Cronbach's alpha was acceptable to good (t_1: $\alpha = .78$, t_2: $\alpha = .83$, t_3: $\alpha = .83$).

Self-concordance was assessed with the validated self-concordance of the sport- and exercise-related goals scale (Seelig & Fuchs, 2006). This scale measures the intrinsic, identified, introjected, and extrinsic modes of motivation with 12 items. According to the sentence, "I intend to exercise regularly within the next few weeks and months because . . ." participants rated statements such as "it's just fun for me" (intrinsic) or "I have good reason to" (identified). The 6-point Likert scale ranged from 1 (*does not apply*) to 6 (*applies exactly*). Cronbach's alpha was acceptable to good (intrinsic, t_1: $\alpha = .82$, t_2: $\alpha = .78$, t_3: $\alpha = .76$; identified, t_1: $\alpha = .70$, t_2: $\alpha = .82$, t_3: $\alpha = .80$) and questionable to good (introjected, t_1: $\alpha = .62$, t_2: $\alpha = .81$, t_3: $\alpha = .70$; extrinsic, t_1: $\alpha = .67$, t_2: $\alpha = .84$, t_3: $\alpha = .70$).

Exercise and sport volume was assessed with the Physical Activity, Exercise, and Sport Questionnaire (Fuchs et al., 2015). The correlation found between self-report exercise and sport and aerobic fitness (Fuchs et al., 2015) indicates a satisfactory validity of the questionnaire. Participants reported up to three exercise and sport activities that they had done in the last 4 weeks. Furthermore, they specified how often and how long each time they had done the activity. Based on frequency and duration, a weekly volume of exercise and sport in minutes was calculated.

Data Preparation and Analyses

Statistical analyses were performed using SPSS (version 27.0; SPSS Inc., Chicago, IL). At the beginning, the entire sample was checked for multivariate outliers with Mahalonobis distance (χ^2 at $p < .001$; Tabachnick & Fidell, 2013). This led to one MICG participant being removed from the data set. Missing values (4.34%) were estimated using multiple imputation with five data sets (van Ginkel, 2017). In addition, baseline differences for all outcome variables were checked at pretest using t test.

Analyses of ANOVA for repeated measures with the interaction effect (Group × Time), main effect time, and main effect group with the variables for each outcome were calculated to examine the effectiveness of the intervention. The main analyses focused on the overall intervention effect. In addition, sensitivity analyses were done with gender and age included as covariates. Partial eta square (η^2) was calculated as an estimation of effect size. In accordance with Cohen (1988), effect sizes lower than 0.06 were classified as small, 0.06–0.14 as medium, and higher than 0.14 as large. Significance level was set at $p < .05$ for all analyses. The results will be reported in accordance with the CONSORT guidelines (Schulz et al., 2010).

Results

Characteristics of the study participants ($N = 129$) show that the final sample consisted of 67% women ($n = 86$) and an average of 42.40 years of age ($SD_{age} = 12.66$, range = 20–67 years). At t_1, 63% of the participants were inactive, 15% exercised or did sport between 1 and 74 min/week, and 22% ≥75 min/week ($M_{volume} = 37.62$ min, $SD_{volume} = 63.14$ min). Fifty-six participants were part of the IG, and 73 people belonged to the MICG. Table 2 shows additional details of the two groups separately before and after the outlier analysis. With regard to the background variables at t_1 (age and gender), there were no differences found between the two study groups.

Table 2 Participant Characteristics at t_1

	Intervention group	Minimal-intervention control group
	Final sample	
	n = 56	*n* = 73
Variable	% or *M* (SD)	% or *M* (SD)
Gender	68% female, 32% male	66% female, 34% male
Age (years)	41.25 (13.31)	43.27 (12.17)
BMI	26.79 (5.80)	26.12 (4.56)
Nationality		
Swiss	86%	84%
Other	14%	16%
Level of education		
No formal education	0%	3%
First-level education (e.g., primary school)	0%	1%
Second-level education (e.g., apprenticeship)	43%	34%
Third-level education (e.g., university)	57%	56%
Other	0%	6%
Weekly volume of exercise and sport (last 4 wk)	28.84 min (60.89 min)	44.36 min (64.42 min)
Inactive	73%	56%
1–74 min	13%	17%
≥75 min	14%	27%

Note. The subsample of the minimal-intervention control group before outlier analysis differed from the final subsample in age (M_{age} = 43.38 years, *SD* = 12.12 years), BMI (M_{BMI} = 26.05, *SD* = 4.86), weekly volume of exercise and sport (M_{volume} = 49.44 min, *SD* = 77.46), and activity levels (inactive = 55%, 1–74 min = 16%, and ≥ 75 min = 28%). BMI = body mass index.

Furthermore, Table 3 gives an overview of the descriptive statistics of the outcome measures for all measuring times. Preliminary analysis showed relatively small descriptive differences in the outcome measures at pretest with no significant difference ($0.02 < d > 1.98$) except in the identified motivation mode, $t_{ident}(127) = 2.13$; $p = .034$; $d = 3.03$. Overall, the IG showed higher values than the MICG on assessments t_2 and t_3 in MC, PA-specific SC, intrinsic motivation mode, and weekly volume of exercise and sport.

The ANOVA with repeated measures revealed a significant main effect time for MC, $F(2, 88) = 24.78$; $p < .001$; $\eta^2 = .36$; $n = 129$, PA-specific SC, $F(2, 104) = 5.72$; $p = .004$; $\eta^2 = .09$; $n = 129$, intrinsic motivation mode, $F(2, 36) = 5.99$; $p = .006$; $\eta^2 = .25$; $n = 129$, and the weekly volume of exercise and sport, $F(2, 56) = 15.22$; $p = .001$; $\eta^2 = .35$; $n = 129$. A main effect group was found only for the weekly volume of exercise and sport, $F(1, 174) = 6.63$; $p = .011$; $\eta^2 = .04$; $n = 129$ (Table 4).

However, to test research hypotheses, interaction effects need to be analyzed. For MC, the ANOVA yielded a large Group × Time interaction effect, $F(2, 115) = 11.02$; $p < .001$; $\eta^2 = .16$; $n = 129$, (Figure 3a), which supports Hypothesis 1. Results show that members of the IG were able to greatly increase their MC after the counseling event. The telephone booster had another positive effect, whereas the levels of the MICG remained almost the same. Similarly, Group × Time interaction effect is shown for PA-specific SC, $F(2, 156) = 6.57$; $p = .002$; $\eta^2 = .08$; $n = 129$ (Figure 3b). However, this effect is classified as medium and supports Hypothesis 2. Likewise, the results show that the IG increased their PA-specific SC over time, even if slightly, whereas the MICG remained, for the most part, unchanged. Furthermore, analyses revealed a large Group × Time interaction effect for the weekly volume of exercise and sport, $F(2, 96) = 8.67$; $p < .001$; $\eta^2 = .15$; $n = 129$ (Figure 3c), which confirms Hypothesis 4. Results show that IG participants increased their weekly volume of exercise and sport not only after the counseling event (t_2: 60.67 min/week) but also after the telephone booster (t_3: 119.98 min/week), whereas those of the MICG remained relatively constant over time (t_2: 46.81 min/week; t_3: 58.34 min/week).

In contrast, no interaction effect was found for any of the motivation modes of self-concordance, such as intrinsic, $F(2, 67) = 0.39$; $p = .678$; $\eta^2 = .01$; $n = 129$ (Figure 4a), identified, $F(2, 125) = 2.64$; $p = .075$; $\eta^2 = .04$; $n = 129$ (Figure 4b), introjected, $F(2, 49) = 2.67$; $p = .080$; $\eta^2 = .10$; $n = 129$ (Figure 4c), and extrinsic, $F(2, 70) = 0.01$; $p = .989$; $\eta^2 = .00$; $n = 129$ (Figure 4d). Therefore, Hypothesis 3 was rejected.

Sensitivity analysis indicated that the intervention effect on the weekly volume of exercise and sport was affected by gender, $F(2, 241) = 6.51$; $p = .002$; $\eta^2 = .05$. The descriptive details are presented in Supplementary Material S6 (available online). However, no other significant intervention effects were influenced by age or gender.

In summary, three of the four research hypotheses posed were confirmed. The results indicate that participants from the IG who underwent the exercise and sport counseling within the COMET approach improved their MC, their PA-specific SC, and their weekly volume of exercise and sport compared with participants from the MICG. Self-concordance was the only one that could not be improved within the study period. Furthermore, sensitivity analyses showed that the intervention effects found were mostly robust.

Table 3 Descriptive Statistics of the Intervention Group and the Minimal-Intervention Control Group

	Intervention group ($n = 56$)			Minimal-intervention control group ($n = 73$)		
	Assessment t_1	Assessment t_2	Assessment t_3	Assessment t_1	Assessment t_2	Assessment t_3
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
MC	2.82 (0.79)	3.47 (0.83)	3.59 (0.97)	2.95 (0.79)	3.18 (0.85)	3.06 (0.90)
PA-specific SC	2.46 (0.88)	2.85 (0.91)	2.92 (0.89)	2.71 (0.88)	2.78 (0.97)	2.65 (0.91)
Intrinsic motivation mode	3.04 (1.24)	3.36 (1.21)	3.41 (1.16)	3.03 (1.23)	3.28 (1.25)	3.24 (1.16)
Identified motivation mode	4.80 (0.97)	4.66 (1.00)	4.49 (1.09)	4.43 (0.97)	4.63 (1.01)	4.49 (1.10)
Introjected motivation mode	3.24 (1.03)	3.23 (1.18)	3.12 (1.24)	3.09 (1.03)	3.40 (1.19)	3.40 (1.20)
Extrinsic motivation mode	1.66 (0.88)	1.79 (1.11)	1.75 (1.03)	1.78 (0.88)	1.94 (1.17)	1.87 (1.02)
Weekly volume of exercise and sport	28.84 (62.91)	60.67 (81.88)	119.98 (123.64)	44.36 (62.92)	46.81 (85.40)	58.34 (114.98)

Note. Scale from MC and SC ranges from 1 to 5. Scale from all motivation modes ranges from 1 to 6. The data are the pooled values. MC = motivational competence; SC = self-control; PA = physical activity.

Table 4 Time, Group, and Intervention Effects (ANOVA) t_1–t_2–t_3

	Intervention effect			Main effect time			Main effect group		
Variables	*F*	*p*	η^2	*F*	*p*	η^2	*F*	*p*	η^2
MC	11.02	<.001	.16	24.78	<.001	.36	3.40	.661	.01
PA-specific SC	6.57	.002	.08	5.72	.004	.09	4.42	.363	.01
Intrinsic motivation mode	0.39	.678	.01	5.99	.006	.25	0.84	.773	.00
Identified motivation mode	2.64	.075	.04	1.83	.164	.02	2.51	.114	.02
Introjected motivation mode	2.67	.080	.10	1.20	.309	.04	0.82	.367	.01
Extrinsic motivation mode	0.01	.989	.00	1.26	.287	.02	0.29	.589	.00
Weekly volume of exercise and sport	8.67	<.001	.15	15.22	<.001	.35	6.63	.011	.37

Note. The term "intervention effect" refers to the interaction effect Group × Time. $N = 129$. ANOVA = analysis of variance; MC = motivational competence; SC = self-control; PA = physical activity.

Discussion

This present study gives insights into the potential of individual exercise and sport counseling, which focuses on individual preferences and aims to identify suitable exercise and sport activities. Complementary to the existing implementation study (Schmid et al., 2020), the purpose of this research was to test the effectiveness of the COMET approach using a stratified randomized controlled design.

The COMET approach aims to promote motivation, volition, and exercise and sport behavior. Three of the four hypotheses were confirmed. Participants in the IG improved their MC, PA-specific SC, and the weekly volume of exercise and sport, whereas participants in the MICG changed little or hardly at all (Figure 3). Conversely, the hypothesis for self-concordance could not be confirmed.

The effect of intervention on MC was the strongest ($\eta^2 = .16$). Thus, counseling elements succeeded in fostering a person's ability to reconcile current and future activities with their preferences (Rheinberg & Engeser, 2010). One can speculate that the combination of gaining diverse exercise and sport experiences and reflecting on them in a structured way was especially effective. This interpretation is also supported by qualitative findings of Schmid et al. (2020).

A medium effect was observed for PA-specific SC ($\eta^2 = .08$). It may be assumed that the change plan and the troubleshooting, both of which promote PA-specific SC, fostered people's ability to transfer their general intentions to get active into actual exercise and sport behavior. This result is consistent with existing studies that have examined volitional constructs, such as Fischer, Donath, Zwygart, et al. (2019) and Göhner et al. (2009). Both studies have found large effects, which may be explained due to more frequent contacts than in the current study.

A large effect was also observed for the self-reported weekly volume of exercise and sport ($\eta^2 = .15$). Participants from the IG showed an increase of their weekly volume of exercise and sport from an average of 30 min/week (t_1) to around 120 min/week (t_3). In contrast, the MICG remained relatively constant at around 50 min/week (t_1/t_3). This result pattern suggests that the IG may benefit more from the health effects of exercise and sport than the MICG due to the counseling (McTiernan et al., 2019; Reiner et al., 2013). Compared with other studies (e.g., van Hoecke et al., 2014) based mainly on behavior change technique (e.g., goal setting, coping planning, action planning), a slightly larger effect size for self-reported exercise and sport behavior was found in the present study. In contrast, studies with device-based measured exercise and sport behavior found smaller effects (e.g., Fischer, Kreppke, et al., 2019). However, results are in line with existing studies that consider individual preferences to a larger or smaller extent (e.g., Chemtob et al., 2019; Fortier et al., 2011; Fuchs et al., 2011; Kolt et al., 2007).

In contrast to our hypotheses, no effect on self-concordance was observed. Indeed, other intervention studies have shown

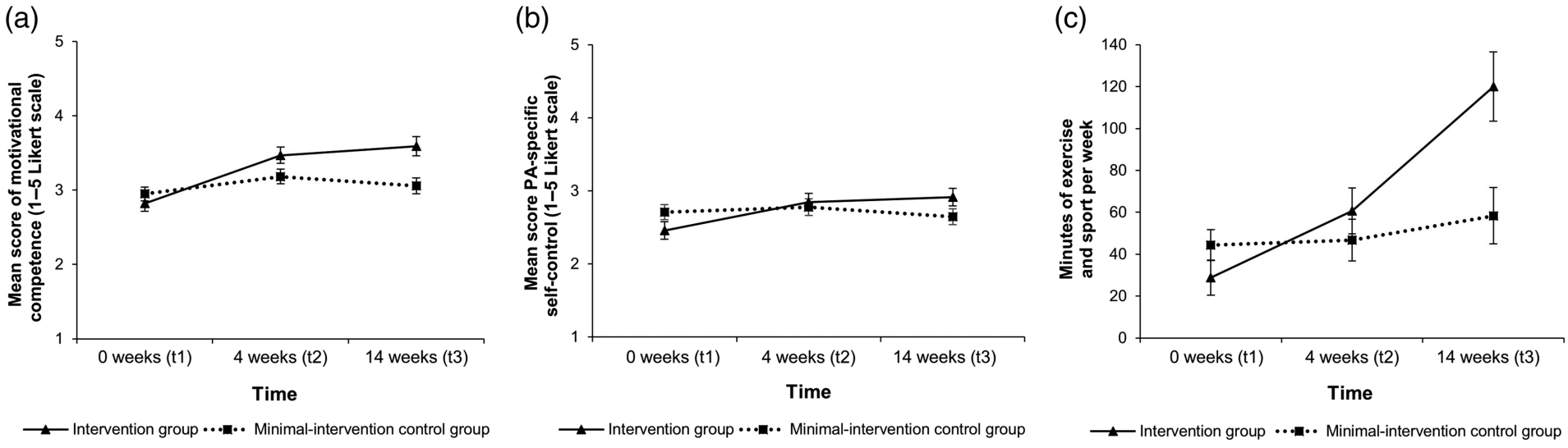

Figure 3 — Means and error bars (representing the *SE* of the mean) of (a) motivational competence, (b) PA-specific self-control, and (c) self-reported weekly volume of exercise and sport (in minutes). PA = physical activity.

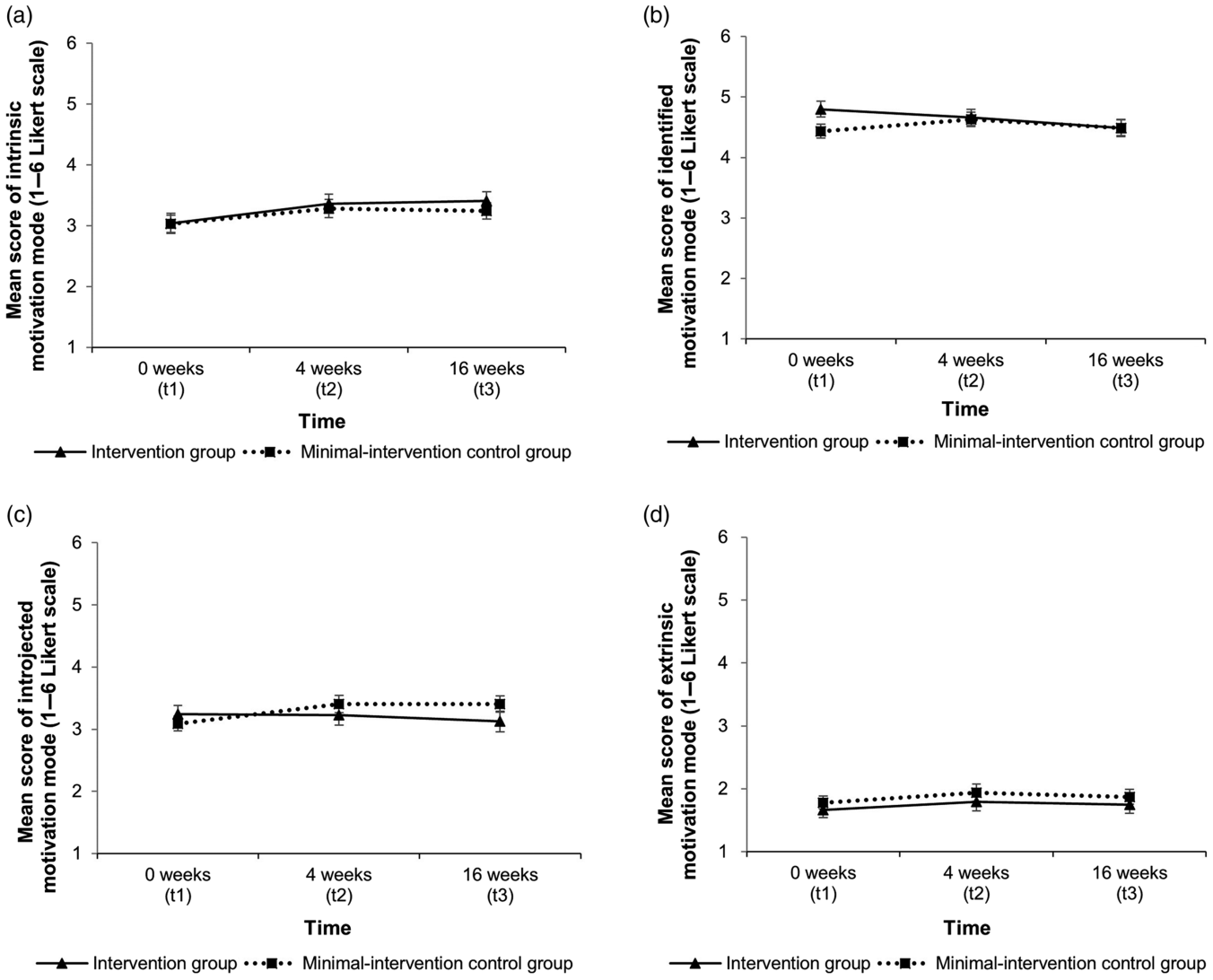

Figure 4 — Means and error bars (representing the *SE* of the mean) of (a) intrinsic motivation mode, (b) identified motivation mode, (c) introjected motivation mode, and (d) extrinsic motivation mode.

heterogeneous results; although Göhner et al. (2009) reported intervention effects on intrinsic and identified motivation, Fischer, Donath, Zwygart, et al. (2019) showed none. Several reasons could bear out our finding. First, compared with MC, self-concordant modes of motivation are relatively stable over time (Emm-Collison et al., 2020). The present intervention could very well have lacked the intensity (e.g., number of contacts) required to motivate individuals to be intrinsically active. Wasserkampf and Kleinert (2016) highlighted that it has not yet been clarified which time period is the most suitable to obtain a change in self-concordance. It is noteworthy that the studies that were able to achieve an effect had more contacts (e.g., Göhner et al., 2009). A second reason for the absence of effect might be the baseline difference found in the identified motivation mode. Participants in the IG reported higher identified motivation already at the start of the counseling than participants of the MICG, making it more difficult to achieve intervention effects.

To summarize, the COMET approach is an effective way to foster motivation, volition, and exercise and sport behavior. People seem to benefit from the comprehensive and systematic focus on individual preferences in the counseling. Compared with existing counseling concepts (e.g., Chemtob et al., 2019; Fortier et al., 2011; Fuchs et al., 2011; Kolt et al., 2007), the COMET approach stands out by combining structured practical experiences with reflection on these experiences. Individuals do not just go to the trial exercise and sport sessions "simply to participate," they get more involved by discussing their experiences and, as a result, become aware of what type of activity they like and what makes them feel good (Schmid et al., 2021). Such a "reflection on action" (Schön, 1983) is a well-established teaching method in the field of educational science (Baartman & Bruijn, 2011) but so far has received relatively little attention in the field of exercise and health promotion (for an exception see, Carl et al., 2020).

Although the COMET approach showed positive results, some limitations need to be stated. First, in the current study, MC, PA-specific SC, and exercise and sport behavior were analyzed as equivalent outcomes. Based on theory and empirical findings (e.g., Sudeck & Pfeifer, 2016), it is assumed that MC and PA-specific SC serve rather as mediators. It can be assumed that

the counseling increased MC and PA-specific SC, which, in turn, may have promoted exercise and sport behavior. Such a mediation model should be investigated in the future; of particular interest is the relative influence of both mediators on the exercise and sport behavior of the participants. Second, the sensitivity analyses showed that the intervention effect on the weekly volume of exercise and sport was affected by gender. As a result of the counseling, men increased their weekly volume of exercise and sport more than women (see Supplementary Material S6 [available online]). However, with the available data, it cannot be clarified why this difference came about (e.g., differences in psychosocial barriers or communication styles). Future studies are needed to investigate this point and test the robustness of our results more comprehensively. Third, 39 people had to be excluded from our main analyses because there were no data on them to be assessed. However, it is important to note that dropout analyses showed no differences in terms of age, gender, and habitual exercise and sport per week. Therefore, the 39 dropouts may not have affected the study findings at all or only marginally. Fourth, the exercise and sport behavior was self-reported, which poses a bias (Nigg et al., 2020) as the individual's statement may not accurately represent their real exercise and sport behavior. For instance, one cannot rule out the possibility that social desirability influenced the data (e.g., participants of the IG improved their exercise and sport behavior after they participated in the counseling due to the fact that this was viewed favorably by the research team or others). However, the use of a well-validated questionnaire minimizes this bias (Fuchs et al., 2015). Nevertheless, an accelerometer should be integrated as an additional measurement in future studies. Fifth, the fact that the MICG received counseling as a "thank you for participating" after the follow-up assessment (t_3) might have led to an overestimation of the effects of intervention (Cunningham et al., 2013). It can be speculated that participants from the MICG decided not to change their behavior rather than moving forward to action. However, intervention effects are even more difficult to prove with a group that has received specific treatment component control (here, minimal intervention) than a nontreatment group (Freedland et al., 2011; Mohr et al., 2009). Therefore, because effects are, indeed, present, they take on even more importance. Sixth, the present sample consists of an above-average number of women (67%) and people with third-level education (e.g., university degree: 57%). A potential consequence of this overrepresentation is that the findings may not be fully generalizable to all Swiss adults in a primary prevention setting.

Some research prospects have already been indicated. In addition, the following issues could be addressed in the future. First, a cost-benefit analysis would be appropriate because the counseling event itself consumes many resources (e.g., time, manpower). It could be examined whether some counseling elements can be shortened, eliminated, or outsourced (e.g., exercise and sport experiences are gained in real life beyond the counseling). For this, however, it would be necessary to know which counseling element has which effect on motivation, volition, and accordingly, the exercise and sport behavior. Second, due to the fact that online or telephone counseling is also effective (e.g., Fischer, Kreppke, et al., 2019), a further study should clarify whether some elements (e.g., one-to-one conversations) of the COMET approach should be implemented in an online setting. Third, the present study was conducted in a nonclinical setting. It would be interesting to know whether the COMET approach would also be effective in a clinical setting (e.g., rehabilitation).

Conclusion

In summary, this study shows that exercise and sport counseling that focuses on an individual's preferences has added value. If a person's motive and goal profile fits a suitable exercise and sport activity (Sudeck et al., 2011), it provides affective well-being and maintenance in exercise and sport behavior (van Vianen, 2018). This is the main idea underlying the COMET approach. The conversations within the counseling are based on MI, which is considered to be a partnership-based approach (Miller & Rollnick, 2013) wherein counselor and participant jointly search for a suitable activity. The COMET approach has an impact first on psychological constructs (MC and PA-specific SC) and second on a person's exercise and sport behavior.

Acknowledgments

This work was, in part, supported by the University Research Priority Program, "Dynamics of Healthy Aging" of the University of Zürich (Dr. Christina Röcke and Dr. Alexander Seifert). They provided smartphones, which were used during the exercise and sport sessions. In addition, we thank Prof. Dr. Ulrich W. Ebner-Priemer (Karlsruhe Institute of Technology) and Prof. Dr. Markus Reichert (Ruhr-University Bochum), as well as Marion Springer and Rosemarie Croizier (University of Tübingen), who also lent us smartphones. Furthermore, we thank Dr. Joost van Ginkel (Universiteit Leiden) for his written guidance for multiple imputation in SPSS and his additional advice. Finally, we would like to thank all counselors and, especially, Constanze Greule and Lea Reimann for their dedicated work.

Funding: This research was financially supported by the health insurance, Atupri. The funder had no role in study design, data collection, data analysis, decision to publish, or preparation of the manuscript.

Note

1. A subsample of the study by Schmid et al. (2020) is identical to the IG of the present study.

References

Baartman, L.K.J., & Bruijn, E. (2011). Integrating knowledge, skills and attitudes: Conceptualising learning processes towards vocational competence. *Educational Research Review, 6*(2), 125–134. https://doi.org/10.1016/j.edurev.2011.03.001

Bélanger-Gravel, A., Godin, G., & Amireault, S. (2013). A meta-analytic review of the effect of implementation intentions on physical activity. *Health Psychology Review, 7*(1), 23–54. https://doi.org/10.1080/17437199.2011.560095

Carl, J., Sudeck, G., & Pfeifer, K. (2020). Competencies for a healthy physically active lifestyle—Reflections on the model of physical activity-related health competence. *Journal of Physical Activity and Health, 17*(7), 688–697. https://doi.org/10.1123/jpah.2019-0442

Chemtob, K., Rocchi, M., Arbour-Nicitopoulos, K., Kairy, D., Fillion, B., & Sweet, S.N. (2019). Using tele-health to enhance motivation, leisure time physical activity, and quality of life in adults with spinal cord injury: A self-determination theory-based pilot randomized control trial. *Psychology of Sport and Exercise, 43,* 243–252. https://doi.org/10.1016/j.psychsport.2019.03.008

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.

Cunningham, J.A., Kypri, K., & McCambridge, J. (2013). Exploratory randomized controlled trial evaluating the impact of a waiting list control design. *BMC Medical Research Methodology, 13*(1), 1–7. https://doi.org/10.1186/1471-2288-13-150

Emm-Collison, L.G., Sebire, S.J., Salway, R., Thompson, J.L., & Jago, R. (2020). Multidimensional motivation for exercise: A latent profile and transition analysis. *Psychology of Sport and Exercise, 47,* Article 101619. https://doi.org/10.1016/j.psychsport.2019.101619

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175–191. https://doi.org/10.3758/BF03193146

Finger, J.D., Tafforeau, J., Gisle, L., Oja, L., Ziese, T., Thelen, J., Mensink, G.B.M., & Lange, C. (2015). Development of the European health interview survey—Physical activity questionnaire (EHIS-PAQ) to monitor physical activity in the European Union. *Archives of Public Health, 73,* 59. https://doi.org/10.1186/s13690-015-0110-z

Fischer, X., Donath, L., Zwygart, K., Gerber, M., Faude, O., & Zahner, L. (2019). Coaching and prompting for remote physical activity promotion: Study protocol of a three-arm randomized controlled trial (Movingcall). *International Journal of Environmental Research and Public Health, 16*(3), Article 331. https://doi.org/10.3390/ijerph16030331

Fischer, X., Kreppke, J.-N., Zahner, L., Gerber, M., Faude, O., & Donath, L. (2019). Telephone-based coaching and prompting for physical activity: Short- and long-term findings of a randomized controlled trial (Movingcall). *International Journal of Environmental Research and Public Health, 16*(14), Article 2626. https://doi.org/10.3390/ijerph16142626

Fortier, M.S., Hogg, W., O'Sullivan, T.L., Blanchard, C., Sigal, R.J., Reid, R.D., Boulay, P., Doucet, E., Bisson, E., Beaulac, J., & Culver, D. (2011). Impact of integrating a physical activity counsellor into the primary health care team: Physical activity and health outcomes of the Physical Activity Counselling randomized controlled trial. *Applied Physiology, Nutrition, and Metabolism, 36*(4), 503–514. https://doi.org/10.1139/H11-040

Freedland, K.E., Mohr, D.C., Davidson, K.W., & Schwartz, J.E. (2011). Usual and unusual care: Existing practice control groups in randomized controlled trials of behavioral interventions. *Psychosomatic Medicine, 73*(4), 323–335. https://doi.org/10.1097/PSY.0b013e318218e1fb

Fuchs, R., Göhner, W., & Seelig, H. (2011). Long-term effects of a psychological group intervention on physical exercise and health: The MoVo concept. *Journal of Physical Activity and Health, 8*(6), 794–803. https://doi.org/10.1123/jpah.8.6.794

Fuchs, R., Klaperski, S., Gerber, M., & Seelig, H. (2015). Messung der Bewegungs- und Sportaktivität mit dem BSA-Fragebogen: Eine methodische Zwischenbilanz [Measurement of physical activity and sport activity with the BSA questionnaire]. *Zeitschrift für Gesundheitspsychologie, 23,* 60–76. https://doi.org/10.1026/0943-8149/a000137

Fuchs, R., Seelig, H., Göhner, W., Schlatterer, M., & Ntoumanis, N. (2016). The two sides of goal intentions: Intention self-concordance and intention strength as predictors of physical activity. *Psychology & Health, 32*(1), 110–126. https://doi.org/10.1080/08870446.2016.1247840

Gillison, F.B., Rouse, P., Standage, M., Sebire, S.J., & Ryan, R.M. (2019). A meta-analysis of techniques to promote motivation for health behaviour change from a self-determination theory perspective. *Health Psychology Review, 13*(1), 110–130. https://doi.org/10.1080/17437199.2018.1534071

Göhner, W., Seelig, H., & Fuchs, R. (2009). Intervention effects on cognitive antecedents of physical exercise: A 1-year follow-up study. *Applied Psychology: Health and Well-Being, 1*(2), 233–256. https://doi.org/10.1111/j.1758-0854.2009.01014.x

Gollwitzer, P.M., & Oettingen, G. (2016). Planning promotes goal striving. In K.D. Vohs & R.F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 223–244). The Guilford Press.

Hardcastle, S.J., Fortier, M.S., Blake, N., & Hagger, M.S. (2017). Identifying content-based and relational techniques to change behaviour in motivational interviewing. *Health Psychology Review, 11*(1), 1–16. https://doi.org/10.1080/17437199.2016.1190659

Heckhausen, J., & Heckhausen, H. (2018). Motivation and action: Introduction and overview. In J. Heckhausen & H. Heckhausen (Eds.), *Motivation and action* (3rd ed., pp. 1–14). Springer International Publishing.

Klusmann, V., Musculus, L., Sproesser, G., & Renner, B. (2016). Fulfilled emotional outcome expectancies enable successful adoption and maintenance of physical activity. *Frontiers in Psychology, 6*(1990), 1–10. https://doi.org/10.3389/fpsyg.2015.01990

Kolt, G.S., Schofield, G.M., Kerse, N., Garrett, N., & Oliver, M. (2007). Effect of telephone counseling on physical activity for low-active older people in primary care: A randomized, controlled trial. *Journal of the American Geriatrics Society, 55*(7), 986–992. https://doi.org/10.1111/j.1532-5415.2007.01203.x

Lehnert, K., Sudeck, G., & Conzelmann, A. (2011). BMZI – Berner Motiv- und Zielinventar im Freizeit- und Gesundheitssport [BMZI–Bernese motive and goal inventory in leisure and health sports]. *Diagnostica, 57,* 146–159. https://doi.org/10.1026/0012-1924/a000043

Lindwall, M., Weman-Josefsson, K., Sebire, S.J., & Standage, M. (2016). Viewing exercise goal content through a person-oriented lens: A self-determination perspective. *Psychology of Sport and Exercise, 27,* 85–92. https://doi.org/10.1016/j.psychsport.2016.06.011

McTiernan, A., Friedenreich, C.M., Katzmarzyk, P.T., Powell, K.E., Macko, R., Buchner, D., Pescatello, L.S., Bloodgood, B., Tennant, B., Vaux-Bjerke, A., George, S.M., Troiano, R.P., & Piercy, K.L. (2019). Physical activity in cancer prevention and survival: A systematic review. *Medicine & Science in Sports & Exercise, 51*(6), 1252–1261. https://doi.org/10.1249/MSS.0000000000001937

Michie, S., Richardson, M., Johnston, M., Abraham, C., Francis, J., Hardeman, W., Eccles, M.P., Cane, J., & Wood, C.E. (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*(1), 81–95. https://doi.org/10.1007/s12160-013-9486-6

Miller, W.R., & Rollnick, S. (2013). *Motivational interviewing: Helping people change* (3rd ed.). Applications of motivational interviewing. Guilford.

Mohr, D.C., Spring, B., Freedland, K.E., Beckner, V., Arean, P., Hollon, S.D., Ockene, J., & Kaplan, R. (2009). The selection and design of control conditions for randomized controlled trials of psychological interventions. *Psychotherapy and Psychosomatics, 78*(5), 275–284. https://doi.org/10.1159/000228248

Nigg, C.R., Fuchs, R., Gerber, M., Jekauc, D., Koch, T., Krell-Roesch, J., Lippke, S., Mnich, C., Novak, B., Ju, Q., Sattler, M.C., Schmidt, S.C.E., van Poppel, M., Reimers, A.K., Wagner, P., Woods, C., & Woll, A. (2020). Assessing physical activity through questionnaires—A consensus of best practices and future directions. *Psychology of Sport and Exercise, 50,* Article 101715. https://doi.org/10.1016/j.psychsport.2020.101715

O'Halloran, P.D., Blackstock, F., Shields, N., Holland, A., Iles, R., Kingsley, M., Bernhardt, J., Lannin, N., Morris, M.E., & Taylor, N.F. (2014). Motivational interviewing to increase physical activity in people with chronic health conditions: A systematic review and

meta-analysis. *Clinical Rehabilitation, 28*(12), 1159–1171. https://doi.org/10.1177/0269215514536210

Orrow, G., Kinmonth, A.-L., Sanderson, S., & Sutton, S. (2012). Effectiveness of physical activity promotion based in primary care: Systematic review and meta-analysis of randomised controlled trials. *BMJ, 344*(7850), Article e1389. https://doi.org/10.1136/bmj.e1389

Reiner, M., Niermann, C., Jekauc, D., & Woll, A. (2013). Long-term health benefits of physical activity—A systematic review of longitudinal studies. *BMC Public Health, 13*(1), 1–9. https://doi.org/10.1186/1471-2458-13-813

Rheinberg, F., & Engeser, S. (2010). Motive training and motivational competence. In O.C. Schultheiss & J.C. Brunstein (Eds.), *Implicit motives* (pp. 510–548). Oxford University Press.

Rheinberg, F., & Engeser, S. (2018). Intrinsic motivation and flow. In J. Heckhausen & H. Heckhausen (Eds.), *Motivation and action* (3rd ed., pp. 579–622). Springer International Publishing.

Rubak, S., Sandbæk, A., Lauritzen T., & Christensen, B. (2005). Motivational interviewing: A systematic review and meta-analysis. *British Journal of General Practice, 55*(513), 305–312.

Schmid, J., Gut, V., Conzelmann, A., & Sudeck, G. (2018). Bernese motive and goal inventory in exercise and sport: Validation of an updated version of the questionnaire. *PLoS One, 13*(2), Article e0193214. https://doi.org/10.1371/journal.pone.0193214

Schmid, J., Gut, V., Schorno, N., Yanagida, T., & Conzelmann, A. (2021). Variation of affective well-being during and after exercise: Does the person–exercise fit matter? *International Journal of Environmental Research and Public Health, 18,* 549. https://doi.org/10.3390/ijerph1802054

Schmid, J., Schorno, N., Gut, V., Sudeck, G., & Conzelmann, A. (2020). "What Type of Activity Suits Me?" *Zeitschrift für Sportpsychologie, 27*(4), 127–138. https://doi.org/10.1026/1612-5010/a000309

Schön, D.A. (1983). *The reflective practitioner: How professionals think in action*. Basic Books.

Schorno, N., Sudeck, G., Gut, V., Conzelmann, A., & Schmid, J. (2021). Choosing an activity that suits: Development and validation of a questionnaire on motivational competence in exercise and sport. *German Journal of Exercise and Sport Research, 51*(1), 71–78. https://doi.org/10.1007/s12662-020-00698-z

Schulz, K.F., Altman, D.G., & Moher, D. (2010). Consort 2010 Statement: Updated guidelines for reporting parallel group randomised trials. *Trials, 11*(1), 1–8. https://doi.org/10.1186/1745-6215-11-32

Seelig, H., & Fuchs, R. (2006). Messung der sport- und bewegungsbezogenen Selbstkonkordanz [Measuring sport- and exercise-related self-concordance]. *Zeitschrift für Sportpsychologie, 13,* 121–139. https://doi.org/10.1026/1612-5010.13.4.121

Sheldon, K.M., & Elliot, A.J. (1999). Goal striving, need satisfaction, and longitudinal well-being: The self-concordance model. *Journal of Personality and Social Psychology, 76,* 482–497. https://doi.org/10.1037/0022-3514.76.3.482

Strath, S.J., Kaminsky, L.A., Ainsworth, B.E., Ekelund, U., Freedson, P.S., Gary, R.A., Richardson, C.R., Smith, D.T., & Swartz, A.M. (2013). Guide to the assessment of physical activity: Clinical and research applications. A scientific statement from the American Heart Association. *Circulation, 128*(20), 2259–2279. https://doi.org/10.1161/01.cir.0000435708.67487.da

Sudeck, G., & Conzelmann, A. (2011). Motivbasierte Passung von Sportprogrammen: Explizite Motive und Ziele als Moderatoren von Befindlichkeitsveränderungen durch sportliche Aktivität [Motive-based tailoring of sports programes: Explicit motives and goals as moderators of mood changes through sports activities]. *German Journal of Exercise and Sport Research, 41,* 175–189. https://doi.org/10.1007/s12662-011-0194-8

Sudeck, G., Lehnert, K., & Conzelmann, A. (2011). Motivbasierte Sporttypen: Auf dem Weg zur Personorientierung im zielgruppenspezifischen Freizeit- und Gesundheitssport [Motive-based types of sports person: Towards a person-oriented approach in target group-specific leisure and health sports]. *Zeitschrift für Sportpsychologie, 18,* 1–17. https://doi.org/10.1026/1612-5010/a000032

Sudeck, G., & Pfeifer, K. (2016). Physical activity-related health competence as an integrative objective in exercise therapy and health sports—conception and validation of a short questionnaire. *Sportwissenschaft, 46*(2), 74–87. https://doi.org/10.1007/s12662-016-0405-4

Tabachnick, B.G., & Fidell, L.S. (2013). *Using multivariate statistics* (6th ed.). Pearson Education.

Teixeira, P.J., Carraca, E.V., Markland, D., Silva, M.N., & Ryan, R.M. (2012). Exercise, physical activity, and self-determination theory: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity, 9,* 78–108. https://doi.org/10.1186/1479-5868-9-78

van Ginkel, J.R. (2017). *SPSS syntax for applying rules for combining multivariate estimates in multiple imputation*. Leiden University.

van Hoecke, A.-S., Delecluse, C., Bogaerts, A., & Boen, F. (2014). The long-term effectiveness of need-supportive physical activity counseling compared with a standard referral in sedentary older adults. *Journal of Aging and Physical Activity, 22*(2), 186–198. https://doi.org/10.1123/JAPA.2012-0261

van Vianen, A.E.M. (2018). Person–environment fit: A review of its basic tenets. *Annual Review of Organizational Psychology and Organizational Behavior, 5*(1), 75–101. https://doi.org/10.1146/annurev-orgpsych-032117-104702

Vansteenkiste, M., & Sheldon, K.M. (2006). There's nothing more practical than a good theory: Integrating motivational interviewing and self-determination theory. *The British Journal of Clinical Psychology, 45*(Pt. 1), 63–82. https://doi.org/10.1348/014466505X34192

Wasserkampf, A., & Kleinert, J. (2016). Organismic integration as a dynamic process: A systematic review of empirical studies on change in behavioral regulations in exercise in adults. *International Review of Sport and Exercise Psychology, 9*(1), 65–95. https://doi.org/10.1080/1750984X.2015.1119873

Whitlock, E.P., Orleans, C.T., Pender, N.J., & Allan, J. (2002). Evaluating primary care behavioral counseling interventions: An evidence-based approach. *American Journal of Preventive Medicine, 22*(4), 267–284. https://doi.org/10.1016/S0749-3797(02)00415-4

World Health Organization. (2018). *Global action plan on physical activity 2018–2030: More active people for a healthier world*.