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**“What can we Learn from Effective Health Behavior
Change Programs? An Analysis of C. Everett Koop Award
Winners”**

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Table of Contents

Abstract	1
Introduction	2
Health Behavior Change.....	2
The AMSO Framework	4
Awareness.	5
Motivation.	6
Skills.	8
Opportunity.	9
The Present Research.....	10
Method.....	11
Sample of Program Documentations	11
Procedure	12
Data Analysis.....	13
Results	15
Included Data from Documentations.....	15
Characteristics of Winners and Programs	15
Effective Components	18
Physical Activity.....	19
Smoking and Alcohol.	21
Weight and Nutrition.	22
Preventive Health Care.	24
Mental Health and Quality of Life.....	26
Other.	27
The Relative Importance of Awareness, Motivation, Skills and Opportunity	29
Discussion	31
Limitations.....	33
Implications and Future Research	35
References	37
Appendix	43

List of Tables

Table 1: Included and excluded data from documentations	15
Table 2: Duration of programs and level of participation.....	16
Table 3: Physical Activity: Percentage and number of components per component category with corresponding AMSO factor classification	20
Table 4: Smoking and Alcohol: Percentage and number of components per component category with corresponding AMSO factor classification.....	22
Table 5: Weight and Nutrition: Percentage and number of components per component category with corresponding AMSO factor classification.....	23
Table 6: Preventive Health Care: Percentage and number of components per component category with corresponding AMSO factor classification.....	25
Table 7: Mental Health and Quality of Life: Percentage and number of components per component category with corresponding AMSO factor classification.....	27
Table 8: Other: Percentage and number of components per component category with corresponding AMSO factor classification	28
Table 9: Percentage of components per AMSO factor by target area, overall and compared to model	44
Table 10: Number of components per AMSO factor by target area, overall and compared to model.....	44

List of Figures

Figure 1: The relative importance of the four AMSO framework factors (O'Donnell, 2017)..	5
Figure 2: Distribution of winners by number of covered target areas.	17
Figure 3: Percentage of winners offering at least one program in respective target areas.....	18
Figure 4: Number of components per target area.....	19
Figure 5: Comparison of the relative importance of awareness, motivation, skills and opportunities.	30
Figure 6: Levels of analysis illustrated by an example.	43

Abstract

Background: Although most people know the risks of an unhealthy lifestyle, they find it difficult to initiate and maintain a change in health behavior. If designed properly, health behavior change programs at the workplace can support the employees in leading healthier lives. Best practice examples demonstrate what is essential in workplace health promotion.

Method: In total, 63 program documentations of C. Everett Koop Award winners were analyzed. On the basis of the AMSO framework, program components were identified which were applied to raise awareness, increase motivation, build skills and create opportunities.

Results: Successful programs were characterized by addressing several health behaviors and using a multi-component strategy. The identified components were heterogeneous and depended on the addressed health behavior. Components aiming at raising awareness refer to promotion, education and counseling. Motivation enhancing components were summarized under incentives, goal setting, support from management and colleagues and challenges. In order to build skills, different classes, strategy trainings and self-help materials were used. Opportunities were provided through different types of organizational structures, communication systems, environmental changes, policies, assessments, screenings and immunizations. Overall, programs had a strong focus on raising awareness. Motivation and opportunities were also important, while skill building was a minor part. *Conclusion:* The present review helps to draw conclusions for theory from best practice interventions by identifying concrete components. Further research is needed to close the gap between scientific work and practical application.

Keywords: health behavior change, workplace health promotion programs, C. Everett Koop Award, best-practice components, AMSO framework

Introduction

Unhealthy lifestyles, such as physical inactivity, poor nutrition or smoking account for a substantial proportion of avoidable health problems and chronic diseases. According to the World Health Organization (WHO, 2018), they are responsible for approximately 71% of deaths worldwide and present a major health challenge in the 21st century (WHO, 2019). Regarding physical activity, Leyk et al. (2006) found a significant decrease of fitness level in young adults with concurrent increase of body weight over time. More than one quarter of adults do not meet the WHO (2010) recommendation of engaging in moderate-intensity physical activities for at least 150 minutes or to a comparable extent per week (Guthold, Stevens, Riley, & Bull, 2018). Most people know the risks of an unhealthy lifestyle, but struggle to initiate a change and maintain healthy behavior (O'Donnell, 2005). Desk jobs contribute to an inactive lifestyle and stress at the workplace is associated to various health risks like poor dietary choices (Hamilton, Healy, Dunstan, Zderic, & Owen, 2008; Ng & Jeffery, 2003).

Meanwhile, an increasing number of companies recognize the benefits of health promotion in form of health behavior change programs to support employees in leading a healthy lifestyle (Linnan, Cluff, Lang, J. Penne, & Leff, 2019). O'Donnell (2009, p. iv) defines health promotion as “the art and science of helping people discover the synergies between their core passions and optimal health, enhancing their motivation to strive for optimal health, and supporting them in changing their lifestyle to move toward a state of optimal health”. The workplace presents an ideal setting for health promotion programs because people are easy to reach and organization is practical (Goetzel & Ozminkowski, 2008). When designed properly, such programs can improve employees' health and reduce employers' costs (DeGroot & Kiker, 2003; Goetzel et al., 2014; Goetzel & Ozminkowski, 2008; Pelletier, 2009). This is accompanied by a growing interest in what works best and how resources are dispensed reasonably. Literature suggests considering underlying theoretical processes of health behavior change, when implementing behavior modification strategies and organizational structures (O'Donnell, 2005; Verplanken & Wood, 2006). Effective programs can demonstrate what works best in practice, what is characterizing successful interventions and give implications for theory (Serxner, Gold, Meraz, & Gray, 2009).

Health Behavior Change

The adoption and maintenance of healthy behavior are the key to optimal health (Schwarzer, 2008). Thereby, “health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (WHO, 2020, p. 1). In accordance

with the salutogenetic approach, it is central to enhance physical, mental and social health (Antonovsky, 1996). Often this requires health behavior change, thus people need to adopt and maintain health-enhancing behavior to increase well-being. Specific interventions support people to change their health behavior. Encouraging and maintaining regular physical activity, a balanced diet, appointments for check-ups and other healthy behaviors is a challenge. Particularly when unhealthy behavior is already routinized.

Daily life is characterized through routinization. When people repeat actions in stable circumstances, automatized responses known as habits develop (Verplanken, 2006). In many cases these self-sustaining patterns of behavior have been formed over years and are easy and comfortable to perform (O'Donnell, 2017). Habitual responses are triggered by environmental cues (Wood, Quinn, & Kashy, 2002; Verplanken, 2006). This process is mentally efficient and accompanied by a lack of awareness what makes it difficult to control (Verplanken, 2006). Diary studies by Wood et al. (2002) found that participants were more likely to think about issues unrelated to current actions when engaged in habitual behavior. Almost 50% of their behavior was performed without thinking about it. Therefore, habits enable us to perform routine actions very effectively while saving cognitive resources to focus on other thoughtful activities. But due to automaticity, breaking bad habits requires great effort, and effective strategies need to be applied (Verplanken & Wood, 2006).

Habit theory provides valuable implications for behavior change interventions depending on habit strength (Gardner, 2015; Rothman, Sheeran, & Wood, 2009; Verplanken & Wood, 2006). Verplanken and Wood (2006) distinguish downstream from upstream interventions. Downstream interventions are designed for individuals who already lead an unhealthy lifestyle and treat the problems after they occur, whereas upstream interventions prevent health problems from occurring. Methods of downstream interventions focus on behavior modification and address individual decision making. This works for weakly or not habitual behavior, but when performance contexts remain stable, strong habits limit the effectiveness of downstream interventions. Downstream interventions are more promising when they are combined with natural occurring environmental changes like a relocation. These downstream-plus-context-change interventions use the openness for new information when old habits are disrupted. Evidence is provided for example by Wood, Tam, and Guerrero Witt (2005). When students transferred to a new university, this context change prevented the activation of habitual responses and they acted more likely on their current intentions to exercise. Upstream interventions focus on structural conditions and use policies, environmental support and social norms to prevent health problems (Verplanken & Wood,

2006). Unwanted habits are disrupted through environmental change and desired habits are maintained.

In addition to habitual strength, health behavior change depends on a variety of cognitive and social factors that partly intertwine (Schwarzer, 2008). Researchers have worked towards identifying the factors that facilitate prediction and explanation of health behavior change. Such psychological models and theories explain and predict health behavior change on the individual level. Strategies to change and implement behavior are necessary. Integrating theoretical frameworks to develop strategies and interventions is the first step in supporting meaningful and lasting health behavior change. When it comes to the actual construction of such programs, health science provides various recommendations concerning effective components. In the following, a model by O'Donnell (2005) with four basic factors of health promotion is described. The underlying psychological principles which are involved in the process of health behavior change are embedded in the model description to emphasize their interaction.

The AMSO Framework

In 2005, Michael O'Donnell proposed a simple framework to develop and evaluate any program designed to change behavior. The awareness, motivation, skills and opportunity (AMSO) framework provides a compact answer to what works best for health promotion at the workplace. Accordingly, these four factors are necessary to help people practice a healthy lifestyle. O'Donnell's conceptual framework is based on both systematic and nonsystematic approaches. One source was a systematic collection of detailed program information that provided the theoretical basis. Another source was his own experience in managing worksite health behavior change programs, which enabled him to evaluate the practical implementation.

O'Donnell (2017) proposes that awareness, motivation, skills and opportunity are responsible for effective behavioral change to a different extent, with awareness explaining 5% of variance, motivation 30%, skills 25%, and opportunity 40% (Figure 1). The investment of resources to implement a health behavior change program should be in proportion to the proposed model. In the following section the four factors of the AMSO framework are described in more detail.

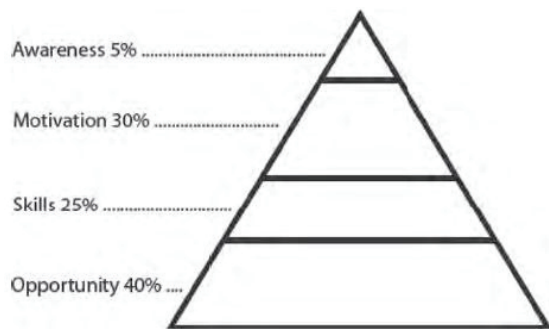


Figure 1. The relative importance of the four AMSO framework factors (O'Donnell, 2017).

Awareness. Before people can even consider making a behavior change, they need to be aware of the risks caused by unhealthy behavior and the benefits that come with healthy behavior (O'Donnell, 2005). Communication of health information, for example through e-mails, worksite posters or website advertising can draw the attention to a specific health topic and inform about support options (Taitel, Haufle, Heck, Loeppke, & Fetterolf, 2008). The majority of the early health programs in the 1970s and 1980s focused on classic health education, but today it is widely known, that the right information is not enough to initiate a behavioral change (O'Donnell, 2005). The knowledge about harmful effects of a sedentary lifestyle does not necessarily prompt people to exercise more frequently, otherwise most people would go to the gym regularly. Nevertheless, O'Donnell (2005) strongly emphasizes that education is essential to generate awareness of health issues as a first step into the right direction. Health information adduces important arguments for healthy options. If health programs are offered, people must first become aware of them before deciding to participate. Additionally, education campaigns can shift the general focus on a health topic and initiate a community-wide change. In order to promote programs, tailored communication is more effective than universal messages in persuading people to change their behavior (Noar, Benac, & Harris, 2007). Messages are personalized by addressing people by name or tailoring them to a specific target group. Individual counseling represents the most individualized communication form.

Health education is only effective for weak or non-habitual behavior (Verplanken & Wood, 2006). That is because biases restrain information processing and lead to insensitivity to new information (Fazio, Ledbetter, & Towles-Schwen, 2000) and shallow decisions (Aarts, Verplanken, & van Knippenberg, 1997). Thus, increasing awareness is important, especially for starting a new behavior. For turning that behavior into a habit, or breaking old habits, further components are necessary.

Motivation. The challenge is to figure out specific strategies for the workplace setting to motivate people. In O'Donnell's words: "How to motivate people in the context of a health promotion program is probably the biggest gap in our health promotion knowledge" (O'Donnell, 2005, p. 4). Motivation refers to any kind of general drive or tendency to do something (Baumeister & Vohs, 2007). Motivated people want to gain and use available information to make a behavior change, they want to learn useful skills and try to find a supportive environment themselves (O'Donnell, 2005).

There are several sources of motivation. One source is having a goal or intention of changing behavior. Generally, the stronger the intention, the more likely healthy behavior is (Ajzen, 1991). The theory of planned behavior by Ajzen (1991) implies that attitudes, subjective norms and perceived behavioral control interact and shape the intention which then manifests in behavior. Often people have a goal of changing behavior, but difficulties may arise that prevent them from achieving the goal. According to Sheeran and Webb (2016), difficulties occur during a specific goal pursuit phase. More precisely, when people try to get started, keep goal pursuit on track and bring goal pursuit to a successful closure. Health behavior change programs can assist to initiate, maintain and complete goal pursuit. The goals should be measurable (Latham & Locke, 1991) and compatible with existing goals (Nielsen, 2017). O'Donnell (2017) points out that for every individual, different goals are worth striving for. Only very health-conscious people strive to be healthy because they just want to be healthy. But for others health might not be a reward for itself. In this case, it is advisable to shift the focus towards goals which are connected to personal advantages that come with good health. To give an example, boosting energy and concentration for the job could be the key to motivation for becoming more physically active. Based on their study results, Milyavskaya, Inzlicht, Hope and Koestner (2015) submit that striving for personally meaningful goals reduces conflicting or tempting desires. People need to pay attention if the current behavior conflicts with their goals. Vigilant monitoring, which means paying actively attention and thinking 'do not do that', has been proven to be effective even for habitual behavior (Quinn, Pascoe, Wood, & Neal, 2010). This strategy does not prevent activation of the habitual response but increases the strength of conscious inhibition. For example, meditation is a good way to improve self-monitoring (Teper & Inzlicht, 2013).

The second source of motivation is self-efficacy, which refers to people's confidence to control their behavior (Ajzen, 1991). It is defined as the situation-specific belief in one's ability to take actions and has a strong influence on motivation (Bandura, 1997). Often there remains a discrepancy between intentions and behavior that is often called the intention-

behavior gap (Sheeran, 2002). Sniehotta, Scholz and Schwarzer (2005) provide evidence, that self-efficacy plays an important role in bridging the gap. When people are confident about taking actions like changing a behavior, it enhances their motivation and increases the likelihood to initiate subsequent behavior. After a successful implementation of a behavior change, people gain even more confidence, which in turn leads to facilitation of further actions. Across a range of health domains, self-efficacy has been examined in association with the adoption and implementation of health behavior (Bandura, 1997; Strecher, DeVellis, Becker, & Rosenstock, 1986). For example, self-efficacy significantly predicted weight loss behavior (Linde, Rothman, Baldwin, & Jeffery, 2006). But since in this study the effect did not remain after the intervention, the results are limited to initiating a change. Luszczynska (2004) raised self-efficacy by mastery experience and observational learning in an intervention for breast self-examination. O'Donnell (2005) complements, when people are convinced that a specific behavior leads to a desired health outcome, behavioral efficacy is high and positively affects performance.

The third source of motivation are action prompts. Implementation of beneficial behavior requires detailed action planning (Sniehotta et al., 2005). For example, Gollwitzer (1999) found, that prompting people to an action, such as by forming implementation intentions, motivates them to start that particular action. Implementation intentions imitate the cue-response mechanism for establishing habits (Gollwitzer, 1999). The goal-directed plans of action follow the form: When situation X arises, I perform the goal-directed response Y. For example: When I return from work, I put on my sport shoes and go jogging. The simple if-then plans have been applied to different health behaviors. It has been demonstrated that the instruction of forming implementation intentions significantly increases fruit consumption (de Nooijer, de Vet, Brug, & de Vries, 2006), frequency of breast self-examination and facilitates losing weight on a long-term basis (Lally, Chipperfield, & Wardle, 2008). Even if implementation intentions are helpful to increase and establish healthy behavior, they cannot compete with existing cue-response associations and therefore are not able to break strong habits (Webb, Sheeran, & Luszczynska, 2009).

The fourth source of motivation is enjoyment. Intrinsically motivated people do something for the satisfaction of the activity itself (Ryan & Deci, 2000). Contrary to intrinsically motivated people, extrinsically motivated people do something to achieve an external outcome. When individuals attribute their new behavior to an external reward, it can inhibit potential intrinsic motivation and lead to extrinsic motivation. Intrinsic motivation can develop through recognizing and appreciating personal benefits that evolve from healthy

behavior (Seifert, Chapman, Hart, & Perez, 2012). Other strategies to enhance intrinsic motivation are a sense of belonging and recognition through visible membership, communication of success stories of role models and group competitions.

Finally, the last source of motivation discussed here are incentives. Incentives are helpful to attract participants for a program (Seifert et al., 2012). Incentives include financial as well as nonfinancial rewards (Taitel et al., 2008). For financial incentives it applies, the higher the total monetary value of the incentive, the higher the participation level in health risk assessments, while the type of incentive does not play a role (Taitel et al., 2008). Loeppke (2012) strongly recommends the incorporation of outcome-based incentives for worksite health programs. In a quasi-experimental study, Hunter, Tully, Davis, Stevenson and Kee (2013) determined that financial incentives did not increase the time being physically active. Beyond motivation to participate, strategies like implementation intentions are superior, compared to financial incentives (Achtziger, Glas, Kenning, & Rudolph, 2019). It is important to emphasize that financial incentives are external motivators. This means people only behave in a desired healthy way to get money, and as soon as they get it, they might stop taking care of their health.

Skills. When people are aware of a health issue and are also motivated to change a specific behavior, it is necessary to build skills to transform motivation into action (O'Donnell, 2005). This includes both technical (for example learning to prepare healthy food) and psychological skills (learning to overcome barriers) alike. If a person knows how beneficial regular physical activity is and hence wants to make a change, the problem often is how to get started, how to exercise on a daily life basis, how to choose a supportive environment or how to overcome obstacles which might occur. Perhaps the person is interested in learning a new form of sport and needs instructions to practice techniques. Without new skills it is quite unlikely to translate the best intentions into action and to achieve a long-term change of bad habits (O'Donnell, 2017). O'Donnell (2005) points out that a successful skill-building program should focus on practical learning instead of theoretical book learning. Moreover, it should prepare participants for difficult situations and teach strategies to handle them. Potential barriers are a lack of time, low perseverance, an inactive partner, other social influences and limited access to facilities like a gym. Integrating tools for self-regulation is critical for preparing people for demanding situations (Verplanken & Wood, 2006). Further helpful skills to be mentioned concern effective time management, self-motivation or creation of new routines.

O'Donnell (2017) gives a description of three stages for the skill-building process. Learning is the first stage. The difficulty is finding a suitable learning style for the individual adjusted to the complexity of the new behavior. Direct interaction with experts like counselors or coaches is supportive for people who need more help. Those offerings extend from face-to-face personal or group sessions to telephone or mail counseling. Practicing is the second stage. Practicing the new behavior enhances self-efficacy, which in turn leads to more endurance when practicing (Bandura, 1997). Building support and reinforcement is the third stage (O'Donnell, 2017). This stage is about building skills to arrange physical and social environment to facilitate maintaining the healthy behavior.

Opportunity. Besides awareness, motivation and skills, people need the opportunity to actually perform healthy behavior (O'Donnell, 2005). Loeppke (2012, p. 889) states "that the fundamental goal of any wellness program should be to provide opportunities for individuals to improve their health and wellness". In the majority of cases, people are moderately motivated and skilled (O'Donnell, 2005). Because self-regulation for an active creation of a supportive environment demands big effort, people often fall back into old behavior patterns (Baumeister & Vohs, 2007). Especially in this case, the availability of supportive environment plays a crucial role for successful health behavior change (O'Donnell, 2005). Even employees who lack motivation and skills can be encouraged to practice healthy behavior in the right environment. The reason for this is the increase of motivation that comes with enhanced self-efficacy and behavioral efficacy when they experience the effects of healthy behavior. Also highly motivated and skilled persons benefit from opportunity which facilitates integration and maintenance of health behavior. As habits are triggered by environmental cues, effective programs need to control the environment to disrupt very strong habits (Verplanken & Wood, 2006). Companies should use upstream interventions that address structural features to break strong bad habits and promote good habits.

Employers can provide various opportunities at the workplace to make health behavior change easier. There are five elements of a supportive workplace environment mentioned by O'Donnell (2017, p. 5): "Physical environments, organization policies, organization culture, ongoing programs and structures, employee ownership and involvement". The physical environment can provide opportunities to be physically active like broad stairwells, ergonomically sound furniture, fitness facilities or healthy food choices in cafeterias. Employers can also influence health behavior through organization policies like prohibition of smoking and rewards for a low number of absent days. The organizational culture is another supportive element which influences the attitude towards a healthy lifestyle. An

organizational culture which allows to explore and discover individual values and benefits of health enhances the intrinsic motivation to lead a healthy lifestyle (Seifert et al., 2012).

Health-related behavior is not only a matter of individual decisions. Social environments and relations strongly influence individual health behavior (Stephens, 2008). For example, a new employee might start smoking when striving for integration because all other colleagues usually have cigarette breaks together. The employer can offer different programs like fitness classes and care for structures like a health promotion department (O'Donnell, 2005).

Furthermore, companies can enable employees to design, promote, deliver or lead programs themselves. Employee ownership and involvement gives employees the opportunity to share their knowledge and skills and motivate their co-workers. A large majority of employees can get involved in program evaluation and the experience of making a difference in the company positively affects self-efficacy.

The Present Research

Theories are necessary to explain and predict health behavior change, as well as for designing and evaluating interventions. In practice, specific theoretical principles are not always explicitly applied. Knowledge of the practitioner is not always rooted in theory. The gap between scientific work and practical application was pointed out by O'Donnell (2005) in this context. This applied knowledge is valuable for future interventions. Serxner et al. (2009) emphasize that best practice examples are the key to find effective components for health programs. The present research aims at examining characteristics of successful health behavior change programs. Hence, the present study applies a different approach to what is typical in academic work; rather than using theory to develop an intervention, this study analyzes existing field interventions to draw conclusions for theory. Therefore, concrete components which were used effectively need to be identified. This leads to the research question: Which interventions and components were already used successfully for occupational health programs to change health behavior?

In order to answer the research question, outstanding health promotion will be analyzed in this review. Specifically, published work of programs that won the C. Everett Koop National Health Award will be used. The criteria of the award ensure that the programs have proven both improving the health of employees and having an economic impact. Details about program components, methods and statistics can be taken from online documentations. The individual documentations have already been evaluated and Goetzel et al. (2016) could prove, that the winners outperformed other companies in terms of business performance. But so far, there were no comprehensive implications reported. All

documentations will be examined for general information like participation rate, health area that is addressed, described components, and then the data will be content-coded based on the AMSO framework. The results bundle up the information on what has proven to be successful and enable recommendations for further improvement for the efficacy of interventions for health behavior change.

Method

Sample of Program Documentations

The C. Everett Koop Award winners represent the best practice programs for this review. As the C. Everett Koop Award winners managed to implement very effective health behavior change programs, the applied components can be recommended for practical use. The winners are selected annually since 1994 by The Health Project in the USA. The Health Project is a non-profit organization. The mission of The Health Project is to evaluate and publish successful health programs and the lessons learned. The winners must document the content of their programs, all health outcomes and the economic impact. To date, 81 winners have received the award, and 72 documentations are available online (thehealthproject.com). To have a chance of being chosen, candidates must meet certain criteria. First, the programs must aim at improving health and reduce health risks through health behavior change. Second, a culture of health must be established. And third, the program has to be cost-effective.

The present review focuses on worksite health behavior change programs which are offered to employees. Documentations were included in the analysis, when they provided information about interventions at the workplace and were targeted at employees. Community health programs were excluded. Moreover, documentations were excluded, if employees were not included as a target group. In case the documentation was not available or did not contain any program information, it was excluded. Besides from winners, The Health Project also recognizes honorable mentions, which were not included in this review. Only the content of the documentations served as data basis. Additional online information, which can be found on The Health Project website, was not integrated. This is because the analysis should be limited to the information provided by the organizations in their original reports. In some cases, documentations refer explicitly to published studies conducted on behalf of the winners to evaluate the programs. Where these were accessible, this information was also used for data analysis.

Procedure

At first, a pretest with ten documentations was conducted. The goal of the pretest was to explore what information about the programs can be taken from the documentations. Because the form of documentation is not standardized, it had to be identified, which information can be extracted from most of the documentations. Based on the exploratory insights from the pretest, the categories for data analysis were defined. General information about the programs like duration, applied theoretical models, additional target groups and level of participation was extracted. Information on the classification of participants into risk groups and shift in risk was also included in the analysis. The economic result was considered for the analysis, if the return-on-investment (ROI) was reported.

As it turned out in the pretest, the programs targeted different health topics (target areas). As research has shown, health promotion that exclusively targets a specific health issue is more effective, compared to general health or lifestyle promotion (Abraham & Graham-Rowe, 2009; DeGroot & Kiker, 2003). Therefore, the programs were analyzed separately for every target area in this review. Six different target areas were identified in the pretest: Physical activity, smoking and alcohol, weight and nutrition, preventive health care, mental health and quality of life, other. Programs promoting an active lifestyle and regular exercise were assigned to the area physical activity. Every program which offered support for employees to quit smoking or stay smoke-free or was aimed at reducing alcohol or drug abuse was assigned to the area smoking and alcohol. Programs designed to support weight loss or to take care of a balanced diet were classified as weight and nutrition. Programs were labeled as preventive health care, when they offered disease management or medical prevention like self-treatment of minor diseases, immunization and cancer screenings. Mental health and quality of life programs aimed at enhancing positive mental health and improving emotional and social well-being. Such programs include for example interventions to reduce stress. All remaining programs, which could not be assigned to any of these target areas, were summarized in the target area other.

In the next step, all relevant information was extracted from the documentations and assigned to the categories. The described components were collected separately for every target area and content-coded according to the AMSO framework. Components for raising awareness (A), increasing motivation (M), building skills (S) or providing opportunities (O) were of interest and included in the analysis. The components of each target area were summarized in terms of content to get a consistent data basis. The resulting data provide the basis for the analysis of effective health behavior change interventions.

Data Analysis

For the data analysis, the extracted information was collected and sorted in an excel file. The components were collected in tables per target area. Within the context of analysis, different levels of analysis are distinguished. The following example illustrates the structure of the levels of analysis. In 2010, three winners received the C. Everett Koop Award. Three different companies represent the winners. One of these companies offers three programs. One of these programs encourages physical activity (target area physical activity) and two programs offer interventions for preventive health care (target area preventive health care). The program which is assigned to the target area physical activity includes fitness classes, advertising e-mails and on-site fitness facilities. These are the components which then need to be summarized in terms of content and assigned to an AMSO factor.

The first level of analysis to be mentioned refers to the number of award years (k_y). Usually, there is more than one winner per year, so the number of winners exceeds the number of award years. The number of winners (k_w) refers to the number of analyzed documentations. Some companies participated in different years and were awarded several times. Therefore, the number of winners (k_w) exceeds the number of awarded companies (k_c). Winners who won several awards submitted a documentation every time. For this reason, the same company can have several documentations included in the analysis. Multiple winners often were awarded for the same programs, but in the meantime between two awards, often new programs, components and outcomes were added. In order to ensure that components which were described by the same company are not included more than once in the analysis, only additional information was taken into account.

The majority of winners documented several programs, which means the number of programs (k_p) exceeds the number of winners (k_w). Every program focused on a specific health topic and was assigned to one of the six target areas. Winners can offer programs concerning several target areas. And more than one program can belong to the same target area. For example, a winner offered a program to lose weight and a program about healthy nutrition. In this case, both programs were assigned to the target area weight and nutrition. If, according to the documentation, all interventions ran under the name of one main program, the main program was divided into programs according to the target areas.

The programs consisted of one or more components (k_c). They represent the tools or offerings of the interventions. For each target area, all collected components were collected and listed. In order to ensure that the analysis is based on consistent data, the collected components were summarized into main categories, referred to as component categories.

These component categories are assigned to either awareness, motivation, skills or opportunity. Crucial for the analysis was the possibility to filter the components by target area, AMSO factor and component category. The components were classified as either A, M, S or O according to the corresponding component category. There was no multiple classification. The classification rules are based on the description of the four AMSO factors according to O'Donnell (2005). Decisive for the classification was the main objective of the component.

In order to ensure a consistent and standardized classification according to the AMSO framework, guidelines for the classification of components were established. Generally, components were classified as A, when they draw attention to health issues or promote the health behavior change program itself. Unspecified information events, seminars or general counseling services were classified as A, unless the focus explicitly lies on building a specific skill or on improving motivation. Then, they were classified accordingly as S or M.

Components classified as M encourage participants to perform healthy behavior, for example by offering different kinds of incentives. These were only classified as M, if the reward was linked to certain criteria. People need to participate, complete the program or show improvement of health outcomes in order to receive them. When people benefit regardless of their participation or performance, for example from corporate benefits, it is a general policy which was classified as O. If a raffle is offered as part of a health program, not everyone wins a prize, but it is all about luck and not performance of health behavior. The aim here is to advertise, and therefore raffles were classified as A.

Components which were classified as S, teach how a behavior is performed. Skill-building interventions teach new strategies or improve existing competencies. Components of this classification explicitly focus on teaching how exactly healthy behavior is performed. For example, videos or self-help books were classified as S, when they clearly explain how something is done to improve health. Otherwise, they were classified as A.

Components were classified as O, when they provide external conditions, structures and rules. There are a few points to note about the classification. When a fitness class was offered in an on-site fitness center, the physical environment is a component classified as O. The fitness class is classified as O as well, unless it is explicitly designed to teach how to practice a specific sport. If for example a fitness trainer leads the course and gives instructions, then the course is classified as S. In some cases, it is also necessary to distinguish between O and M classification. If the employer covers the gym membership, it can increase the employees' motivation to exercise there, but it is rather a policy which benefits all

employees than an incentive and therefore it is classified as O. It should also be mentioned that some interventions do not refer to a specific target area, for example when general health counseling is offered. In that case, counseling was included as a component in every target area covered by the winner.

Results

Included Data from Documentations

The total number of included program documentations is 63, which means 63 winners (k_w) were included in the analysis. Table 1 provides an overview about included and excluded data of the documentations. Nine winners had to be excluded due to missing documentations. Another nine were excluded because the target group did not consist of employees. The remaining winners received the prizes during 23 award years (k_y). Because some companies received the reward several times, the 63 winners are represented by 52 companies (k_c). The company Union Pacific Railroad was awarded most frequently, which is four times. The winners described 314 programs (k_p) in the documentations as basis for the analysis.

Table 1

Included and excluded data from documentations

	Level	Number before analysis	Excluded	Included
Years	k_y	26	3	23
Winners	k_w	81	18	63
Companies	k_c	68	16	52
Programs	k_p			314

Characteristics of Winners and Programs

The general characteristics of winners and programs provided a first insight into the basic conditions and parameters of outstanding health promotion. The analyzed characteristics included the reported program duration, level of participation, additional target groups, application of theoretical models, implementation of health risk assessments and division of risk groups. The health risk reduction and a positive return on investment (ROI) represent the measures of success considered in this analysis. Furthermore, the winners were characterized by the number of target areas they covered with their programs.

In Table 2, the results for duration and level of participation are displayed. At the time of documentation, the programs ran between half a year and 18 years. On average, four years

were included in the award evaluation. The information about the duration was reported by 87.6% of the winners (k_w) in their documentation. For winners who won repeatedly, the duration of programs refers to the time that passed since the last award. The level of participation shows how many employees have been reached by the programs. Different measurements were used to report the level of participation. Often, the total number of participants was documented. The absolute number of participants greatly varies and is influenced by the size of the company. 33.3% of the winners (k_w) documented the overall participation rate across all programs they offered, and 12.4% documented the participation rate for specific programs. Accordingly, the participation rate for any health offering was on average 74.4% and for a specific program 46.9%. The minimum participation level across all programs offered by a winner, was 28%. It should be noted that the percentages varied considerably.

Table 2

Duration of programs and level of participation

	Level	Documentations					
		providing data (%)	<i>min</i>	<i>max</i>	<i>M</i>	<i>Mdn</i>	<i>SD</i>
Duration (years)	k_p	87.6	.5	18	4.51	4	2.67
Participation rate (%)	k_w	33.3	28.0	96.0	74.4	82.5	20.7
Participation rate (%)	k_p	12.4	4.0	97.0	46.9	39.5	25.1

Besides from targeting employees, 38.2% of programs (k_p) also included spouses, family members or retirees. In particular, 35% of programs (k_p) included spouses or the whole family and 14% of programs (k_p) included retirees.

Interestingly, only 22.2% of winners (k_w) indicated to use theoretical models for their health promotion. On the program level, overall 14% of programs (k_p) were based on one or more theoretical models. The transtheoretical model was used most frequently, which was 11.1% of programs (k_p). Other reported models were the AMSO framework, the health belief model, the social cognitive theory, the RE-AIM framework and an integrational organizational model.

Health risk assessments were implemented by 76.2% of winners (k_w) to detect individual health risks. Thereof, 58.3% of winners divided the employees into risk groups to track their progress. Overall, a reduction of individual risks was reported by 47.8% of

programs (k_p) to prove the effect on the health outcome. A positive ROI was reported by 39.7% of the winners (k_w) in order to highlight the economic impact of the programs.

As explained earlier, each program was assigned to one of six target areas. The winners varied in the number of target areas which their programs cover. Figure 2 shows the distribution of winners for every number of covered target areas. In this case, the question was whether a winner covers an area or not. It is not relevant here which specific target areas they cover or how many programs a winner offers within one area, but only how many different ones. All documented programs which could be clearly assigned to a target area were included. This also includes programs whose components have not been specified further. It is apparent that some winners only covered one target area with their programs, while others covered several target areas up to all six different target areas. For 8.1% of the winners (k_w) the programs could be assigned to exactly one single target area. Two different target areas were covered by 12.9% of the winners. For 11.3% of the winners, their programs were assigned to three different target areas. 17.7% of the winners covered four different target areas. Most of the winners (27.4%) covered with their programs five target areas and 22.6% of the winners covered all six target areas. It follows, that 91.9% of the winners covered more than one target area.

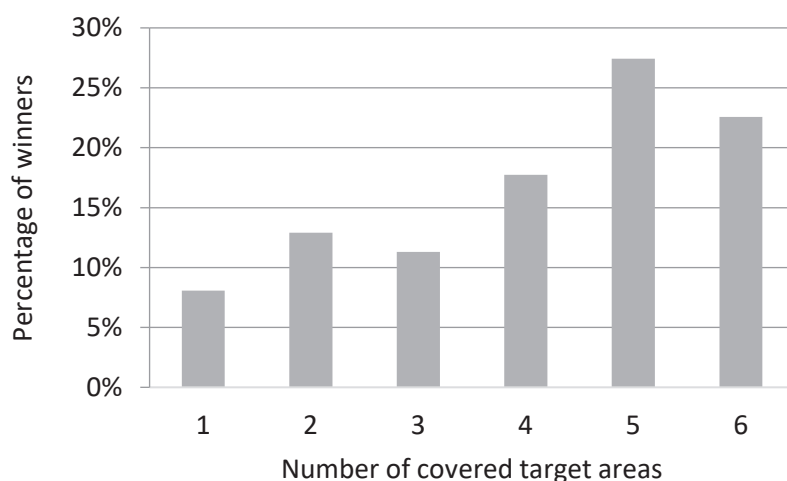


Figure 2. Distribution of winners by number of covered target areas.

The target areas (physical activity, smoking and alcohol, weight and nutrition, preventive health care, mental health and quality of life, other) contain a different number of programs. For the analysis, it is relevant if a winner offered at least one program in a target area or not. As a consequence, the exact number of programs per target area was not determined. The reason for this is that it is not always clear from a winner's documentation, if components within a target area belong to several independent programs or are part of one

program. This analysis is restricted to a conservative approach to avoid misinterpretations. It allows to analyze the percentage of winners who offered a minimum of one program concerning a specific target area. The results are displayed in Figure 3. The majority of winners (k_w) which is 21.5%, offered programs assigned to the target area preventive health care. The target area physical activity was covered with one or more programs by 19.5% of the winners and 18.4% of winners offered programs concerning the target area smoking and alcohol. 18% of winners included minimum one program which concerns the target area weight and nutrition. The target area mental health and quality of life was covered with minimum one program by 12.9% of the winners and 9.8% of the winners covered the target area other.

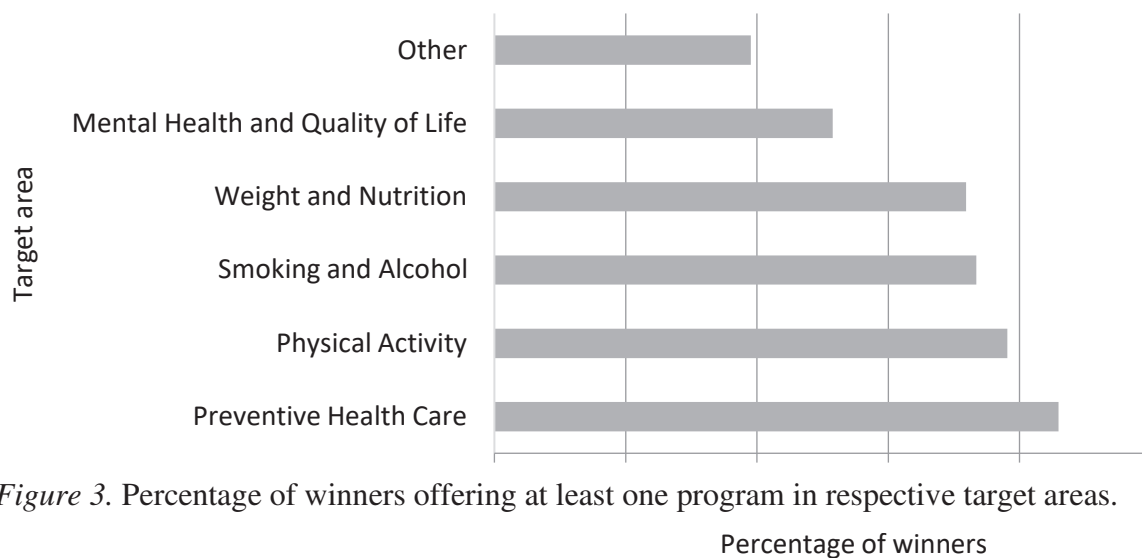


Figure 3. Percentage of winners offering at least one program in respective target areas.

Effective Components

In sum, 1671 components (k_c) were collected from the documentations for the analysis. Therefrom, 36 were not specified, because the winners reported the implementation of a program in this target area but did not describe it. Unspecified components could not be assigned to any component category and it was not possible to classify them according to the AMSO framework. Furthermore, it is unknown how many components the corresponding programs were composed of. For these reasons, the unspecified components were excluded from the analyses on the level of components. The remaining 1634 components belong to the target area of their corresponding program. Of the 314 programs, 282 programs (k_p) contained at least one specific component and they consist of 5.8 components on average.

Figure 4 shows the number of components (k_c) per target area. Most of the components (32.6%) belong to the target area preventive health care. The target area physical

activity contains 22% of the components and the target area weight and nutrition contains 17.1% of the components. 14% of the components belong to the target area smoking and alcohol and 9% of the components belong to the target area mental health and quality of life. Only 5.4% of the collected components belong to programs in the target area other.

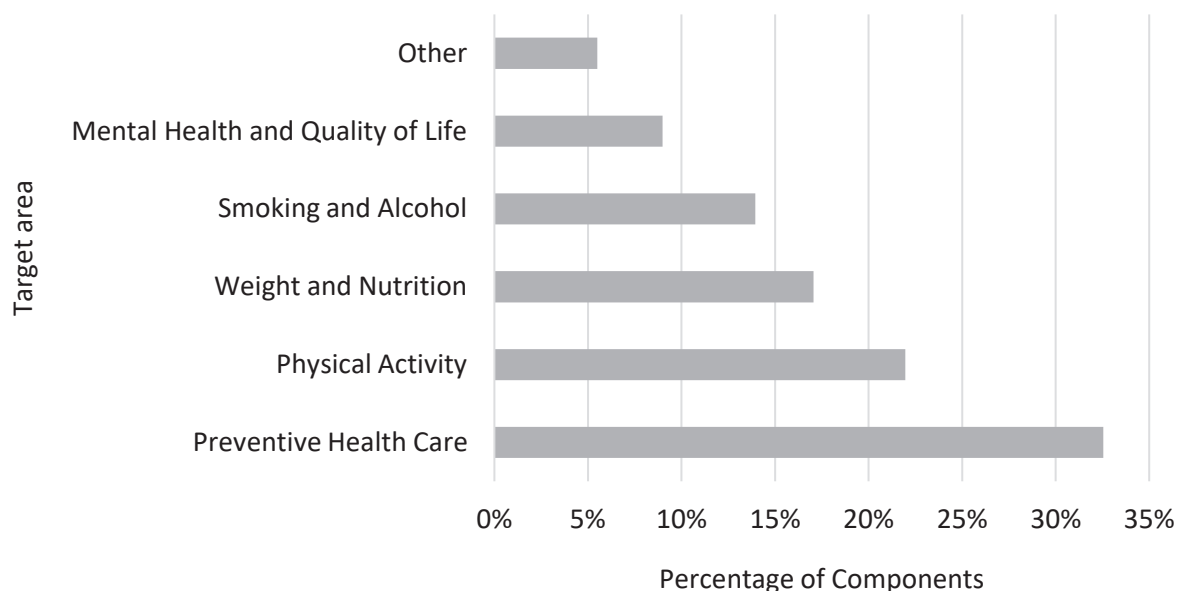


Figure 4. Number of components per target area.

Note. Unspecified components excluded.

Data from Figure 4 can be compared with the data in Figure 3, which shows how often the target areas were covered by winners. The order by frequency is very similar. This is because the more frequent the coverage of one target area, the more corresponding components were reported. Only smoking and alcohol and weight and nutrition are reversed. But Figure 3 reveals, that there is only a small difference between the percentage of winners who covered the area smoking and alcohol and the percentage of winners who covered the area weight and nutrition. The collected components were combined into component categories within the target areas and classified according to the AMSO framework. In the following, the results are presented for each target area.

Physical Activity. In the target area physical activity, 359 components were combined into 16 component categories and classified according to the AMSO framework. The results are displayed in Table 3. Overall, the focus lies on promotion, creating a supportive environment and education. Awareness was raised by 39.8% of the components (k_c) in this target area. They were combined into three component categories: Promotion, education and counseling. Most of the components (22.8%) aimed at promotion of programs, using for

example online newsletters or branding of all materials. Employees were educated using different methods like lunch and learn seminars or quizzes. Awareness was also raised by face-to-face or phone counseling.

Motivation was enhanced by 21.4% of the components (k_c) in this target area. They were combined into five component categories: Incentive, challenge, goals, management support and social support. Incentives (9.2% of the components) were used most frequently to enhance motivation. Employees received for example a discount on the fitness membership costs for visiting minimum twice per week. Challenges, mostly step challenges, were organized. At this point, an example should be highlighted. Participants were grouped and received pedometers to count their steps with the common goal of virtually walking to different cities. Individual goal setting was encouraged for example in coaching sessions. Management support was indicated by explicit commitment or participation of the management level. Occasionally, success stories of employees contributed to social support.

Skills were built by 5.6% of the components (k_c) in this target area. They were combined into three component categories: Class, strategy training and self-help materials. Predominantly, classes were offered for building skills (3.6% of the components). Yoga classes are an example. Strategy training was used by some winners and includes for example design of personal fitness prescriptions. Self-help materials like online tutorials were rarely used to teach skills.

Opportunity was provided by 33.1% of the components (k_c) in this target area. They were combined into five component categories: Environment, organizational structure, policy, communication system and assessment. On-site fitness facilities and therefore environmental changes were mainly provided (12.8% of the components). Offerings like an employee outdoor club or the implementation of a wellness team are examples for organizational structures. The majority of policies specified corporate benefits like discounts for fitness equipment. Online health portals represent communication systems and fitness assessments were offered to enable the evaluation of individual fitness.

Table 3

Physical activity: Percentage and number of components per component category with corresponding AMSO factor classification

AMSO factor	Component category	Number of components	Components (%)
Awareness	Promotion	82	22.8
	Education	36	10.0

	Counseling	25	7.0
	Incentive	33	9.2
	Challenge	18	5.0
Motivation	Goals	12	3.3
	Management support	11	3.1
	Social support	3	0.8
	Class	13	3.6
Skills	Strategy training	5	1.4
	Self-help materials	2	0.6
	Environment	46	12.8
	Organizational structure	33	9.2
Opportunity	Policy	24	6.7
	Communication system	10	2.8
	Assessment	6	1.7
	Total	359	100.0

Note. Unspecified components excluded.

Smoking and Alcohol. In the target area smoking and alcohol, 228 components were combined into 12 component categories and classified according to the AMSO framework. The results are displayed in Table 4. Overall, the focus lies on promotion, policies and education. Awareness was raised by 52.6% of the components (k_c) in this target area. They were combined into three component categories: Promotion, education and counseling. Most of the components (30.7%) aimed at promotion of programs, using for example postcards or LED displays. Employees were educated using different methods like audio libraries or presentations. Awareness was also raised by face-to-face or phone counseling.

Motivation was enhanced by 21.1% of the components (k_c) in this target area. They were combined into four component categories: Incentive, management support, goals and social support. Incentives (10.5% of the components) were used most frequently to enhance motivation. Employees received for example \$50 if they did not smoke. Management support was indicated by explicit commitment or participation of the management level. Individual goal setting was encouraged for example using an online tool to set a quit date. Additionally, buddy programs and health success stories contributed to social support in some cases.

Skills were built by 4.4% of the components (k_c) in this target area. They were combined into two component categories: Self-help materials and strategy training. Both were

applied equally frequent (2.2% of components each). Self-help materials like self-help kits to stop smoking were used to teach skills. Strategy training includes for example the selection and usage of smoking cessation tools.

Opportunity was provided by 21.9% of the components (k_c) in this target area. They were combined into three component categories: Policy, communication system and organizational structure. Policies, in particular non-smoking policies were imposed very often (14.9% of the components). Online health portals represent communication systems. Offerings like smoking cessation support or the implementation of a wellness team are examples for organizational structures.

Table 4

Smoking and alcohol: Percentage and number of components per component category with corresponding AMSO factor classification

AMSO factor	Component category	Number of components	Components (%)
Awareness	Promotion	70	30.7
	Education	28	12.3
	Counseling	22	9.6
Motivation	Incentive	24	10.5
	Management support	10	4.4
	Goals	8	3.5
	Social support	6	2.6
Skills	Self-help materials	5	2.2
	Strategy training	5	2.2
Opportunity	Policy	34	14.9
	Communication system	9	3.9
	Organizational structure	7	3.1
Total		228	100.0

Note. Unspecified components excluded.

Weight and Nutrition. In the target area weight and nutrition, 279 components were combined into 15 component categories and classified according to the AMSO framework. The results are displayed in Table 5. Overall, the focus lies on promotion, education, counseling and environmental changes. Awareness was raised by 53.4% of the components (k_c) in this target area. They were combined into three component categories: Promotion,

education and counseling. Most of the components (26.2%) aimed at promotion of programs, using for example the intranet or brochures. Employees were educated using different methods like weight management seminars or online articles. Awareness was also raised by face-to-face or phone counseling.

Motivation was enhanced by 20.1% of the components (k_c) in this target area. They were combined into five component categories: Incentive, goals, management support, challenge and social support. Incentives (9.3% of the components) were used most frequently to enhance motivation. Employees received for example a gift card worth \$25 if they lost 5% of their weight. Individual goal setting was encouraged for example using online tools. Management support was indicated by explicit commitment of the management level. Weight loss challenges, like group weight loss competitions, were organized. Social support was encouraged for example through healthy makeovers of colleague recipe submissions.

Skills were built by 7.9% of the components (k_c) in this target area. They were combined into three component categories: Strategy training, class and self-help materials. Predominantly, strategy training was used to build skills (4.7% of the components). Videos about strategies to avoid overeating are an example. Classes like healthy cooking classes were offered by some winners. Self-help materials like online recipes and online tutorials were sometimes used to build skills.

Opportunity was provided by 18.6% of the components (k_c) in this target area. They were combined into four component categories: Environment, communication system, policy and organizational structure. Healthy food choices in cafeterias and nutrition labeling, therefore environmental changes, were mainly provided (10% of the components). Online health portals represent communication systems. The majority of policies specified corporate benefits like discounts for weight reduction programs. Typical organizational structures are the implementation of wellness teams and partnerships with external providers of weight reduction programs.

Table 5

Weight and nutrition: Percentage and number of components per component category with corresponding AMSO factor classification

AMSO factor	Component category	Number of components	Components (%)
Awareness	Promotion	72	26.2
	Education	48	16.8
	Counseling	29	10.4

	Incentive	26	9.3
	Goals	10	3.6
Motivation	Management support	8	2.9
	Challenge	6	2.2
	Social support	6	2.2
	Strategy training	13	4.7
Skills	Class	5	1.8
	Self-help materials	4	1.4
	Environment	28	10.0
Opportunity	Communication system	9	3.2
	Policy	8	2.9
	Organizational structure	7	2.5
	Total	279	100.0

Note. Unspecified components excluded.

Preventive Health Care. In the target area preventive health care, 534 components were combined into 16 component categories and classified according to the AMSO framework. The results are displayed in Table 6. Overall, the focus lies on providing screenings, promotion and education. Awareness was raised by 42.1% of the components (k_c) in this target area. They were combined into three component categories: Promotion, education and counseling. Most of the components (18.2%) aimed at promotion of programs, using for example health fairs or screening reminders. Employees were educated for example using free handbooks or presentations. Awareness was also raised by face-to-face or phone counseling.

Motivation was enhanced by 10.9% of the components (k_c) in this target area. They were combined into four component categories: Incentive, goals, management support and social support. Incentives (6.8% of the components) were used most frequently to enhance motivation. Employees received for example a gift card worth \$25 for completing a self-care assessment. Individual goal setting was encouraged for example in coaching sessions. Management support was indicated by explicit commitment of the management level. Occasionally, success stories of employees and support groups contributed to social support.

Skills were built by 2.6% of the components (k_c) in this target area. They were combined into two component categories: Class and self-help materials. In classes (1.5% of the components), skills like providing first aid were taught. Classes for breast self-exam are

another example. Self-help materials like self-learning videos were used occasionally to teach skills.

Opportunity was provided by 44.4% of the components (k_c) in this target area. They were combined into seven component categories: Screening, organizational structure, immunization, environment, communication system, assessment and policy. Most of the components in this target area (21.2%) represent screenings. Physiological measures such as blood pressure and cholesterol were often collected at these screenings and cancer screenings like mammography were provided. Organizational structures, primarily disease management, account for 12.2% of the components. Flu vaccinations and therefore immunization was provided. A health-promoting environment was created by on-site medical facilities like on-site clinics or offerings like self-monitoring blood pressure stations. Online health portals represent communication systems. Assessments like health assessments were conducted. The majority of policies specified discounts on prescription drugs or cost coverage of medical costs.

Table 6

Preventive health care: Percentage and number of components per component category with corresponding AMSO factor classification

AMSO factor	Component category	Number of components	Components (%)
Awareness	Promotion	97	18.2
	Education	84	15.8
	Counseling	43	8.1
Motivation	Incentive	36	6.8
	Goals	9	1.7
	Management support	9	1.7
	Social support	5	0.9
Skills	Class	8	1.5
	Self-help materials	5	0.9
Opportunity	Screening	113	21.2
	Organizational structure	65	12.2
	Immunization	19	3.6
	Environment	12	2.3
	Communication system	11	2.1
	Assessment	8	1.5

Policy	8	1.5
Total	532	100.0

Note. Unspecified components excluded.

Mental Health and Quality of Life. In the target area mental health and quality of life, 147 components were combined into 12 component categories and classified according to the AMSO framework. The results are displayed in Table 7. Overall, the focus lies on promotion, education and counseling. Awareness was raised by 61.9% of the components (k_c) in this target area. They were combined into three component categories: Promotion, education and counseling. Most of the components (33.3%) aimed at promotion of programs, using for example intranet postings or flyers. Employees were educated using different methods like audio libraries or presentations about mindfulness. 11.6% of the components were applied to raise awareness by face-to-face or phone counseling.

Motivation was enhanced by 19.7% of the components (k_c) in this target area. They were combined into four component categories: Incentive, management support, goals and social support. Incentives were used most frequently (10.9% of the components) to enhance motivation. Employees received for example gift cards for earned health points. Management support was indicated by explicit commitment of the management level. Individual goal setting was encouraged for example in coaching sessions. Only one component addresses social support by health success stories of employees.

Skills were built by 8.2% of the components (k_c) in this target area. They were combined into three component categories: Strategy training, self-help materials and Class. Strategy training (3.4%) was used predominantly to build skills in this target area. It includes for example learning strategies to identify and manage stressors. Self-help materials like online tutorials or videos about priority setting were also used to teach skills. Occasionally, classes were reported which aimed for example at managing stress.

Opportunity was provided by 10.2% of the components (k_c) in this target area. They were combined into two component categories: Communication system and organizational structure. Online health portals represent communication systems. Offerings like an assistance program for emotional problems or access to vendor partner programs represent examples for organizational structures.

Table 7

Mental health and quality of life: Percentage and number of components per component category with corresponding AMSO factor classification

AMSO factor	Component category	Number of components	Components (%)
Awareness	Promotion	49	33.3
	Education	25	17.0
	Counseling	17	11.6
Motivation	Incentive	16	10.9
	Management support	8	5.4
	Goals	4	2.7
	Social support	1	0.7
Skills	Strategy training	5	3.4
	Self-help materials	4	2.7
	Class	3	2.0
Opportunity	Communication system	8	5.4
	Organizational structure	7	4.8
Total		147	100.0

Note. Unspecified components excluded.

Other. In the target area other, 89 components were combined into 13 component categories and classified according to the AMSO framework. The programs in this target area could not be assigned to any specific target area. They address different topics: Maternity management (11 programs), driving habits like seat belt use (8 programs), safety at work (7 programs), sleep problems (4 programs), financial counseling (3 programs), ethics (1 program), handling violence (1 program) and women's health (1 program). The results are displayed in Table 8. Overall, the focus lies on promotion, education and counseling.

Awareness was raised by 57.3% of the components (k_c) in this target area. They were combined into three component categories: Promotion, education and counseling. Most of the components (22.5%) aimed at promotion of programs, using for example posters or newsletters. Employees were educated using different methods like seminars. Awareness was also raised by face-to-face or phone counseling.

Motivation was enhanced by 14.6% of the components (k_c) in this target area. They were combined into four component categories: Incentive, goals, challenge and management support. Incentives were used most frequently (6.7% of the components) to enhance

motivation. Managers received for example a bonus for meeting specific safety goals. Individual goal setting was encouraged, for example using online tools. One program included a challenge between work groups. It was a competition for the best safety rate. Management support was indicated by explicit commitment of the management level.

Skills were built by 9% of the components (k_c) in this target area. They were combined into two component categories: Strategy training and class. Mainly, strategy training was offered for building skills (5.6% of the components). For example, strategies for self-defense were learnt. Safety training was provided in classes.

Opportunity was provided by 19.1% of the components (k_c) in this target area. They were combined into four component categories: Organizational structure, policy, screening and environment. Predominantly, organizational structures were provided (12.4% of the components) and concerned mostly maternity management. Policies specified for example safety rules. Screenings to determine sleep disorders and prenatal risks were conducted. Offerings like an employee outdoor club or the implementation of a wellness team are examples for organizational structures. One component belongs to environment. In this case, on-site lactation rooms were provided.

Table 8

Other: Percentage and number of components per component category with corresponding AMSO factor classification

AMSO factor	Component category	Number of components	Components (%)
Awareness	Promotion	20	22.5
	Education	17	19.1
	Counseling	14	15.7
Motivation	Incentive	6	6.7
	Goals	5	5.6
	Challenge	1	1.1
	Management support	1	1.1
Skills	Strategy training	5	5.6
	Class	3	3.4
Opportunity	Organizational structure	11	12.4
	Policy	3	3.4
	Screening	2	2.2
	Environment	1	1.1

Total	89	100.0
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Note. Unspecified components excluded.

The Relative Importance of Awareness, Motivation, Skills and Opportunity

The proportion of components (k_c) classified as A, M, S or O reflects the distribution of used resources. The distribution of resources in turn reflects the relative importance of the factors A, M, S and O. The more resources were spent in favor of a factor, the more important it is for the target area. Figure 5 shows a comparison of the relative importance of the four factors for every target area and across all areas. Additionally, Figure 5 illustrates the suggested relative importance of the four factors according to the model by O'Donnell (2017) for comparison.

With the exception of the target areas preventive health care and physical activity, more than half of the resources were used to raise awareness within every target area. The percentage of components classified as awareness is highest in the target area mental health and quality of life, which is over 60%. The proportion of awareness is lower in the target areas preventive health care (42.1%) and physical activity (39.8%). These results are very different from the relative importance of 5% for awareness according to the model.

Enhancing motivation is apparently very important in the target areas physical activity, smoking and alcohol, and weight and nutrition. The proportion of components classified as M lies at around 20% here. Less emphasis was placed on enhancing motivation in the area preventive health care (10.9%). In all areas, the proportion of components classified as M was below the 30% in the model.

The proportion of skills was lowest of all four factors in all areas. Comparatively, the proportion of components classified as S was higher in the target areas other (9%) and mental health and quality of life (8.2%). Skill building plays a minor role especially in der target area preventive health care, with 2.6% of components. In all target areas, the proportion of components classified as S was far below 25%, which was suggested by O'Donnell (2017).

In the target area preventive health care, the focus lies on the provision of opportunity. Here, the proportion of O outweighed that of A. It is 44.4% and exceeds the 40% expected by O'Donnell (2017). The proportion of O is also relatively important in the target area physical activity, with 33.1% of components. In the remaining target areas, the proportion of components classified as O is below the suggested 40%. Remarkably low is the proportion in the target area mental health and quality of life, with 10.2% of components classified as O.

The results for the relative importance of the factor proportions across all areas show the overall dominance of the factor A, with 47.6% of components. Overall, 17.2% of the components were classified as M. By far the fewest resources were classified as S (5.3%). Nearly 30% of all components aim at providing opportunity.

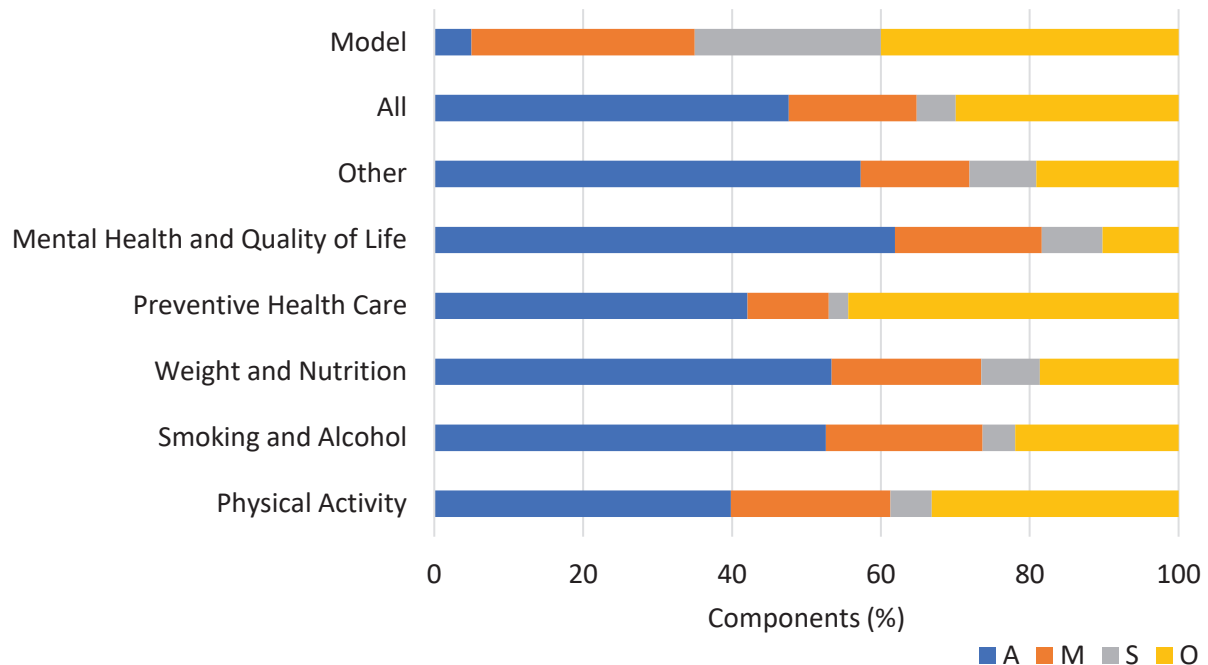


Figure 5. Comparison of the relative importance of awareness, motivation, skills and opportunities.

Note. All: across all target areas. Model: suggested model by O'Donnell (2017).

Unspecified components excluded.

A chi-square goodness of fit test was performed to compare the present results of AMSO factor proportions of each target area with the proportions suggested by O'Donnell (2017). The proportions of AMSO factors in the target area physical activity differed significantly from those the model, $X^2(3, N = 359) = 938.34, p < .00$. In the target area smoking and alcohol, the proportions of AMSO factors differed significantly from those in the model, $X^2(3, N = 282) = 1098, p < .00$. The proportions of AMSO factors in the target area weight and nutrition differed significantly from those in the model, $X^2(3, N = 279) = 1381.1, p < .00$. In the target area preventive health care, the proportions of AMSO factors were significantly different from those in the model, $X^2(3, N = 532) = 1638.6, p < .00$. The proportions of AMSO factors in the target area mental health and quality of life differed significantly from those in the model, $X^2(3, N = 147) = 1006.5, p < .00$. In the target area other, the proportions of AMSO factors differed significantly from those in the model, $X^2(3,$

$N = 89$) = 512.82, $p < .00$. Also, the proportions of AMSO factors across all target areas differed significantly from those in the model, $X^2(3, N = 1634) = 6319.7$, $p < .00$. As a result, the proportions of AMSO factors for each target area, as well as across all target areas, differed significantly from those the model.

Discussion

The aim of this research was to examine outstanding health promotion programs to determine effective components for health behavior change. Practical interventions were used to make conclusions for theory. Program documentations of C. Everett Koop Award winners were analyzed to make implications for what works best in health promotion at the workplace. Based on the AMSO framework (O'Donnell, 2005), program components which were used to raise awareness, enhance motivation, build skills and provide opportunity were identified. A large variation of programs and components were found in the documentations. The results serve as an orientation guide for the critical components and characteristics.

The findings suggest that successful workplace health promotion is primarily focused on raising awareness by promoting the range of programs and the advantages of a healthy lifestyle. Central aspects of awareness raising also include the education of employees and the provision of individual counseling. In order to increase motivation, incentives were mainly used in the field interventions. Goal setting and support from management or colleagues were often reported. Challenges were organized to motivate employees to take physical exercise or to achieve their desired weight. Successful programs that develop employees' skills included classes, strategy training and self-help materials. Environmental changes created opportunities for health-conscious behavior. Communication systems and organizational structures enabled rapid information exchange and effective program management. Policies limited harmful behavior and defined the use of partner services and corporate benefits. In assessments, employees could learn about their physical condition. Screenings and immunization were often part of medical preventive health care in order to recognize and avoid diseases.

Differences between target areas became partly apparent, which supports the reference that programs should be tailored to the health issue (Abraham & Graham-Rowe, 2009; DeGroot & Kiker, 2003). While similar components for raising awareness were used across all target areas, the components differed more between target areas when it comes to strengthening motivation, building skills or providing opportunities. Clearly, e-mails and posters can be used to promote any type of program. For this reason, especially promotion of

programs is often done across all target areas. On the contrary, the provision of a gym is very specific for offering an opportunity within a physical activity program.

The present results on the relative importance of the AMSO factors do not correspond to the proportions suggested by O'Donnell (2017). While he attaches the least importance to the factor awareness, the results of the field interventions indicate a much higher importance. On the contrary, he suggests a relatively high importance for the factor skills, while the results suggest this factor is least important. Motivation and opportunities are relatively important across all areas, both in the model and according to the results. There are several possible explanations for the discrepancies. One explanation is that in theory, the importance of awareness raising is greatly underestimated, and the importance of teaching skills is overestimated. This would imply, that the assumptions of theory do not correspond to the practical application. It is also conceivable, that the programs documented by the C. Everett Koop Award winners would be even more effective, if the proportion of components had been adapted to the model. Another possible explanation for the results may be an incomplete data basis because of unreported components. Also, it must be taken into account that the application of awareness raising components is much cheaper than providing opportunities or teaching skills. It is much more expensive to pay trainers, equip a gym and coordinate the classes than to hang up a poster and send out e-mails for health information.

Particularly remarkable in the current study is that successful health promotion mostly addresses several behaviors and follows a multi-component strategy. This finding suggests, that the coverage of several health areas and the use of many different components contribute to success. The heterogeneity of components reflects the diversity of the individually designed programs. Previous research confirms the common practice of using several components and covering different areas. When presenting best practices, a number of guidelines are usually listed which, taken together, should improve health outcomes. Terry, Seaverson, Grossmeier and Anderson (2008) identified nine best-practice program components, which were consistently identified in the literature. These components correspond to the present findings and include for example management support, use of incentives and health screenings. In accordance with the present results, one of the most consistent observations by Goetzel et al. (2007) was that the worksite health promotion programs targeted several health behaviors. In addition, they named several key success factors of health promotion, which relate to the current findings, such as the establishment of organizational structures and the consideration of individual components such as counseling. They also see attaining high participation levels as crucial. The present results give reason to support this. The average participation level of

almost 75% is very high, compared to typical participation rates of less than 50% as observed by Robroek, van Lenthe, van Empelen and Burdorf (2009). Accordingly, a multi-component strategy and focusing on several behaviors favors a high participation level and thus contributes to program success. The focus on awareness raising is another explanation for the high participation level (Taitel et al., 2008). As it turned out, many programs let partners and families of employees participate. Studies have found evidence that interventions are more effective for couples than individual interventions (Arden-Close & McGrath, 2017). It can therefore be beneficial to make programs accessible to partners and family members.

Some winners reported tailoring the programs to individual levels of readiness to change. During the process of behavior change, the individual willingness and capacity to change health behavior varies. Therefore, effective interventions should be tailored to different stages of change (Prochaska, DiClemente, Velicer, & Rossi, 1993). The transtheoretical model postulates a progress through six stages of behavior change (Prochaska & Velicer, 1997). Based on this model, self-efficacy is a fundamental principle which positively influences the progress. While people in the contemplation or action stage can be recruited for action-oriented programs, people in the precontemplation stage first need to be attracted to participate. As a conclusion, programs need to be tailored to the individual.

Limitations

The extraction of information from the winners' documentations was accompanied by some limitations. First, the heterogeneity of documentations and programs limits the comparability. Since the content of the documentations has not been standardized, they varied in terms of the information provided, comprehensiveness and measurements. Of course, it is only possible to include the programs and components in the analysis which were reported in the documentation. For this reason, components or entire programs that were applied but not documented may be missing. In some cases, it was only mentioned that some program was offered concerning a specific health issue, but not which components were used. Therefore, a great amount of data was not available. Due to the different measurements of success, it was not possible to determine which programs or winners were more successful than others. The improvement of health was documented in different ways. Even when a distinction of risk groups was made and the shift in risk was provided, the criteria for risk group classification were not standardized. In addition, it must be assumed that the demographic data of the participants differs between the various programs. As has been shown, best-practice components have a different impact, depending on individual demographics such as age and gender of participants (Terry, Grossmeier, Mangen, & Gingerich, 2013). To demonstrate

economic success, often the ROI was reported, but the winners calculated it differently and the duration of programs has an impact on financial outcomes.

Second, the assignment of components to a target area and one of the AMSO factors was not always clear. If components were applied across target areas, it was not clearly described whether they were used for all target areas or only parts of them. For example, counseling was often aimed at various health issues. When components were not described in detail, it was not always clear whether a component aimed at raising awareness, enhancing motivation, building skills or providing opportunity. Therefore, misinterpretations of the components cannot be ruled out. A seminar or a handbook about self-care can teach knowledge, but also support the development of skills. If both is the case, then the focus is not clear. In unclear cases, books and seminars were summarized as education and thus categorized as awareness, because health information was provided. But it might be the case, that the focus of many seminars and books was on building skills, which means the number of components aiming at developing skills is actually higher. It is also possible that seminars or counseling were aimed at increasing motivation, but due to the lack of information, the percentage of motivation is lower.

Third, the attribution of success to the components is limited, because only successful programs were analyzed. It is possible that not all identified components are effective or that certain combinations of components are required. Due to the above described multi-component strategy, the success of the programs cannot be attributed to individual components. It was not possible to determine which components add any value or are more effective than others. Each program has a different composition of components and no statement can be made about the best combination of components. Furthermore, the conditions in field interventions do not remain stable during the program period. Other factors could be responsible for an improvement of employee health and a reduction of health costs. Changes in the company structures, in management or at the personnel level could have affected the results. Moreover, external events such as public health campaigns could have had an influence. It follows that no causality between components and success is ensured here. Another point is the issue of reverse causality. The review is based on the assumption that well-designed programs have a positive economic impact. Conversely, innovative large companies with motivated employees are also more likely to establish and maintain such programs.

When it comes to the generalizability of the results, it is important to emphasize that all programs were conducted in the USA. Depending on the health care system in the

respective country, some services and treatments are already covered by health insurance and are not dependent on the employer. In addition, the winning companies come from different industry sectors. Among different occupation groups certain health problems predominate and require tailored prevention and treatment (Xia & Collie, 2020). Therefore, some components might be more effective in certain industries.

Implications and Future Research

The present results should be treated with caution due to the limitations mentioned above. Nevertheless, the present findings of best practice allow for some implications. Concerning health promotion theory, there is reason to suspect that the importance of the factor awareness for health interventions has been underestimated. The skills factor, on the other hand, may have been overestimated. For the relative high importance of the factors motivation and opportunity confirming results were provided.

In the workplace context, the results suggest that health behavior change programs should have a strong focus on awareness raising, especially to promote the programs and educate the employees. Much attention should be paid to promoting motivation and offering opportunities. Supplementary offers can be made to build skills. Due to the variety of components, there are many options for companies to implement interventions within their individual possibilities. The required effort and costs for implementation vary between components. Therefore, depending on company size and budget, different components can be realized for raising awareness, enhancing motivation, building skills or providing opportunity. It is important, however, that the programs offered include different components and cover several health care areas. If possible, health promotion practitioners should tailor programs to the target area and participants.

This review contributes to the research on best practice examples. Further research is needed to close the gap between scientific work and practical application. Best practice guidelines are promising for supporting health promotion practitioners. Organizations and employees can benefit from the findings of best practice, as high-quality program components are superior to common-practice components and have proven to be more successful in reducing risks (Terry et al., 2008). Especially the dissemination of information about success factors among employers and health promotion practitioners is a challenge (Goetzel & Ozminkowski, 2008). The evaluation and awarding of outstanding health promotion and the publication of the program documentations make an important contribution.

Future examinations of successful programs would be more conclusive if program documentations and evaluations were more comparable. Standardized information about

design, procedure, applied components, underlying theoretical models, participants, and outcomes would allow further conclusions. In future studies, the additional value of individual components could be examined more closely. It would also be interesting to test and compare different combinations of components for their effectiveness. It remains unclear whether programs would be even more successful if they considered the suggested AMSO factor proportions by O'Donnell (2017). This could be a research question for further studies. Unfortunately, it is very difficult to get information from unsuccessful programs. If such information is available, a comparison would be valuable. In conclusion, this review has already provided insights into effective health behavior change programs and allows for continuous improvement.

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Appendix A

Levels of analysis

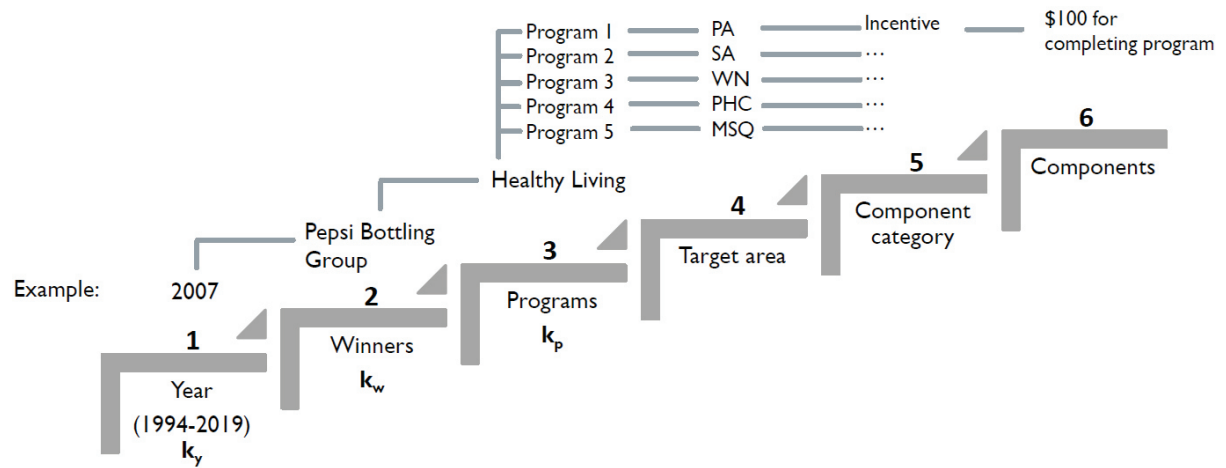


Figure 6. Levels of analysis illustrated by an example.

Appendix B
Components per AMSO factor

Table 9 *Percentage of components per AMSO factor by target area, overall and compared to model*

	Components per AMSO factor			
	A (%)	M (%)	S (%)	O (%)
Physical Activity	39.8	21.4	5.6	33.1
Smoking and Alcohol	52.6	21.1	4.4	21.9
Weight and Nutrition	53.4	20.1	7.9	18.6
Preventive Health Care	42.1	10.9	2.6	44.4
Mental Health and Quality of Life	61.9	19.7	8.2	10.2
Other	57.3	14.6	9.0	19.1
All	47.6	17.2	5.3	29.9
Model	5	30	25	40

Note. All: across all target areas. Model: suggested model by O'Donnell (2017).

Unspecified components excluded.

Table 10 *Number of components per AMSO factor by target area, overall and compared to model*

	Components per AMSO factor				
	A	M	S	O	Total
Physical Activity	143	77	20	119	359
Smoking and Alcohol	120	48	10	50	228
Weight and Nutrition	149	56	22	52	279
Preventive Health Care	224	58	14	236	532
Mental Health and Quality of Life	91	29	12	15	147
Other	51	13	8	17	89
All	778	281	86	489	1634

Note. All: across all target areas. Model: suggested model by O'Donnell (2017).

Unspecified components excluded.

Appendix C

Deutsche Zusammenfassung

Einführung: Obwohl die meisten Menschen die Risiken eines ungesunden Lebensstils kennen, fällt es ihnen schwer, ihr Gesundheitsverhalten zu ändern und die Änderung aufrecht zu erhalten. Wenn sie richtig konzipiert sind, können Programme der betrieblichen Gesundheitsförderung Arbeitnehmer dabei unterstützen, ein gesünderes Leben zu führen. Best-Practice-Beispiele zeigen, worauf es bei der betrieblichen Gesundheitsförderung ankommt. *Methode:* Insgesamt wurden 63 Dokumentationen der Programme von C. Everett Koop Preisträgern analysiert. Auf der Grundlage des AMSO Modells wurden Programmkomponenten identifiziert, die zur Erhöhung des Gesundheitsbewusstseins (Awareness), zur Steigerung der Motivation (Motivation), zum Aufbau von Fähigkeiten (Skills) und zur Schaffung von Gelegenheit (Opportunity) für gesundes Verhalten eingesetzt wurden. *Ergebnisse:* Erfolgreiche Programme zielten auf verschiedene Gesundheitsbereiche ab und verwendeten eine Mehrkomponentenstrategie. Die identifizierten Komponenten waren heterogen und abhängig vom jeweiligen Gesundheitsbereich. Komponenten zur Erhöhung des Gesundheitsbewusstseins beziehen sich auf Werbung, Bildung und Beratung. Motivationsfördernde Komponenten wurden unter Belohnung, Zielsetzung, Unterstützung durch das Management und Kollegen und Wettbewerbe zusammengefasst. Um Fähigkeiten aufzubauen, wurden verschiedene Kurse, Strategietrainings und Selbsthilfematerialien verwendet. Gelegenheit zu gesundem Verhalten wurden durch verschiedene Arten von Organisationsstrukturen, Kommunikationssystemen, Umweltveränderungen, Richtlinien, Assessments, Screenings und Impfungen geboten. Insgesamt hatten die Programme einen starken Fokus auf Bewusstseitssteigerung. Motivation und Gelegenheiten waren ebenfalls wichtig, während der Aufbau von Fähigkeiten eine untergeordnete Rolle spielte. *Fazit:* Der vorliegende Review trägt durch die Identifizierung konkreter Komponenten dazu bei, aus erfolgreichen Interventionen Schlussfolgerungen für die Theorie zu ziehen. Weitere Forschung ist erforderlich, um die Lücke zwischen wissenschaftlicher Arbeit und praktischer Anwendung zu schließen.

Keywords: Änderung des Gesundheitsverhaltens, Programme zur betrieblichen Gesundheitsförderung, C. Everett Koop Award, Best-Practice-Komponenten, AMSO-Modell