The effect of personal lifestyle intervention among health care providers on their patients and clinics; the Promoting Health by Self Experience (PHASE) randomized controlled intervention trial\(^\star\)

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**Abstract**

**Objective.** To determine the effect of self-experience multidisciplinary lifestyle intervention on health care providers (HCPs), patients and clinics.

**Methods.** We randomized 15 primary-care clinics (serving 93,821 members), matched by patient profile, to provide the HCPs, either intervention or control HMO program. We followed personally 77 HCPs and 496 patients, and evaluated clinical measurement rate (CMR) changes (January–September 2010; Israel).

**Results.** HCPs within the intervention group demonstrated personal improvement in health initiative attitudes (\(p=0.05\) vs. baseline), and a decrease in salt intake (\(p=0.05\) vs. control). HCP intervention group’s patients exhibited overall improvement in dietary patterns, specifically in salt, red meat (\(p=0.05\) vs. baseline), fruit, and vegetable (\(p=0.05\) vs. control) intake. Height, lipids, HbA1c and CMR increased within the intervention group’s clinics (\(p=0.05\) vs. baseline) with increased referral to angiography tests (\(p=0.05\) vs. control). Within the intervention group, HCPs’ salt pattern improvement was associated with increased lipid CMR (\(r = 0.71\); \(p = 0.048\)), and lower HCPs’ body weight was associated with increased blood pressure (\(r = -0.81; p = 0.015\) and lipid (\(r = -0.69; p = 0.058\)) CMR.

**Conclusions.** HCPs’ personal lifestyles are directly correlated with their clinical performance. Interventions to promote health through HCP’s self-experience are valuable and somewhat halosed to patients and clinics, suggesting an adjunct strategy in primary prevention.

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**Introduction**

Lifestyle interventions have been shown to reduce morbidity and mortality from chronic diseases (Dalle Grave et al., 2010; Forman and Bulweer, 2006). Although all the health care providers (HCPs), i.e., doctors, nurses, dietitians, and administrators, have significant roles in primary prevention (Berra, 2010; Kelly, 2008), they do not universally treat patients in full accord with evidence-based guidelines regarding lifestyle-related interventions (Burke and Fair, 2003; Spencer et al., 2006). Barriers for the delivery of health promotion/
personal changes was efficient in improving their personal lifestyle and primary prevention attitudes. In the current Promoting Health by Self Experience (PHASE) randomized controlled multidisciplinary lifestyle intervention trial, the effect of a self-experience intervention program offered to all primary clinic staff on changes in health parameters across three circles; HCPs themselves, their patients, and their entire clinic quality parameters, were further addressed.

Methods

Study population and randomization

Health maintenance organization (HMO)

Clalit is the largest HMO in Israel, providing health services for over 3,900,000 customers. Most primary care services are organized in primary care clinics that include multiple services e.g. nursing, medical (primary care and professional physicians), paramedical, and administrative.

Primary care clinics

The list of clinics from the Dan district of Clalit HMO was obtained from the data management department. Of the 110 clinics in the district 15 were selected based on the inclusion criteria of the study to be contacted and invited to participate in the study by the region's physician. Inclusion criteria: 1. Serving over 3000 customers, 2. Willingness to participate in a lifestyle intervention, 3. High quality measurements and grade for the quality of services, 4. Clinics that can be included in a cluster of three similar clinics by their number of health providing staff, customers, religion, area of service. 5. Recommended for intervention by the district physician. Exclusion criteria: 1. Clinics that were not willing to participate in the randomization process. The randomization process was performed by the participating clinic.

Health care providers (HCPs)

HCPs from 15 primary care clinics serving over 93,000 customers were invited to participate in the PHASE trial. The recruitment was done by sending an invitation letter from the medical district manager, inviting the primary care clinic directors, together with their entire clinical staff, to take part in this program, taking into consideration that they could be randomized to either the intervention or control groups.

The HCPs from the participating clinics were invited to take part in an initiation conference that included lectures and workshops on topics related to health promotion led by occupational psychologists. In this workshop, the HCPs were administered baseline questionnaires and afterward went through a formal randomization. The randomization was performed by clusters of three clinics with similar characteristics (number of patients, number of HCPs, type of services, religion). Of the three clinics in each cluster, two were randomly selected for the intervention and one as a control group.

Patients

We recruited the patients of the participating clinics by randomly selecting patients from each clinic who visited their clinic during the six months before the intervention, were between ages 21 and 50 years, and agreed to take part in two phone call interviews 3–4 months apart. The study was approved by the local ethics advisory board and was registered at ClinicalTrials.gov: NCT01125895.

The Promoting Health by Self Experience (PHASE) intervention program

HCPs from the intervention group participated in five workshop days over three months, and performed in their primary care clinics in small group sessions. The intervention program was planned and delivered by psychologists and social workers trained in group facilitation and experimental learning. The program was based on theories of experimental learning and Bridges’ model of change (Bridges, 1991; Gu and Takahashi, 2000), including self-experience multidisciplinary lifestyle activities and behavioral techniques (Appendix 1).

Evaluation of the intervention program

The impact of the program was evaluated in three layers: HCPs, patients, and clinics.

HCPs

The impact of the program on the HCPs’ attitudes and behavior was assessed by a questionnaire that was administered at baseline and after 3–4 months to both the intervention and control groups. The follow up was based on our previously developed questionnaire (Shahar et al., 2009), with further modifications. The original questionnaire was pretested in our previous study on 12 health professionals (4 physicians, 5 dietitians, 3 nurses) for its internal consistency (Shahar et al., 2009). The questionnaires included demographic, personal dietary patterns, and health promotion attitude components.

Patients

The patients’ questionnaires included demographic and clinical health promotion activity components. The connection with the patients was done via phone call interviews performed by a professional screening company. The patients were not directly informed about the assignment of their clinic.

Clinics

Clinical measurement rates (CMR) of each clinic were provided by the data management department at the central offices of Clalit Health Services. The CMR are indicators for monitoring the implementation of medical tests according to the HMO protocol and aim at 100% target population for each test or procedure. For baseline, we compared the mean levels of six months post-intervention (April–Sept. 2010) to mean levels of three-month pre-intervention (Jan.–March 2010) of these health quality measurements of the 15 clinics.

Sample size calculations

The sample size calculation was done independently for the HCPs and the customers. In both cases the calculation was based on a power of 80% and \( \alpha = 0.05 \).

1. For the HCPs, data from our previous study (Shahar et al., 2009) were used. A significant change among HCPs in waist circumference six months after the intervention with difference between the intervention and the control group of 3.1 cm with SD = 1.6 was shown. Based on these data, the calculated sample size is 12 participants in each group. When change in dietary habits was used for the calculation, the calculated sample size was 22.

2. For the customers, data from a study on a prevention program among diabetes patients was used. Both weight loss and serum cholesterol changes six months from the beginning of the intervention (Roux et al., 2008) were used. Based on these data, the calculated sample size was 153 participants in each group.

Data analyses

Data analysis was performed using SPSS, PASW version 18.0 (SPSS, Inc., Chicago, IL, USA). Within comparisons of each group (before–after) were calculated using paired t-tests. The effect of the intervention was assessed by comparing the change over three months between cases and controls using analysis of variance, \( p \text{ value } < 0.05 \) was considered significant. The same analyses were performed for the patients. Within comparisons in quality measurements by groups were performed using paired t-test. Spearman correlation coefficients were calculated within each group between health promotion activities and personal health data and the relevant quality measurements.

Results

Baseline characteristics

We personally followed 77 HCPs recruited from 15 primary care clinics serving 93,821 members. Fifty-five were assigned for intervention and 22 for control. Of those recruited 53% were physicians, 26% nurses, and 21% administrators. Mean age was 45 years and mean body mass index (BMI) was 24.9 kg/m². Only 10% were smokers and 18% were not engaged in physical activity. A sample of 496 patients was recruited: 346 from the intervention clinics and 150 from the control clinics with 32% men; mean age was 35 years, and mean BMI was 24.4 kg/m². The characteristics of the clinic health staff and patients were distributed similarly across the assigned groups (Table 1). The retention between baseline and follow-up interviews was 95% among the HCPs and 93% among the patients.
HCPs: changes in primary prevention attitudes and personal dietary patterns

In the end of the intervention the HCPs seemed to maintain their relatively normal BMI (24.5 ± 4.6), low rates of smoking habits, as well as low rate of inactivity, without significant changes following the intervention period. The HCPs were asked about changes in their efficiency in performing health promotion and health prevention activities following the intervention. A significantly larger change was detected among the intervention group; 91% reported a considerable change in their activities, compared to 68% only among the control group (p = 0.013 between groups). The HCPs were asked to rank their agreement with selected statements and frequency of several personal dietary patterns (Fig. 1). Within the intervention group, there was an increase in agreement with the statements: “There is a chance to convince a 30-year-old man to start exercising”, and “It is my job to be a positive role model for my patients” (p < 0.05 vs. baseline), but no significant differences were detected between groups. While there was an overall improvement in HCPs’ personal dietary patterns in both groups, only the intervention group had significantly decreased the frequency of adding salt (p < 0.05 vs. control).

Patients: changes in primary prevention care and personal dietary patterns

Patients from the intervention clinics (Fig. 2) tended to report higher rates of receiving recommendations for both health and non-smoking from the clinic staff after the intervention, as opposed to no change in the control group. However, the gap did not reach statistical significance. Among patients, there was an overall improvement in dietary patterns, with decrease in frequency of salt and red meat (p < 0.05 vs. baseline) in the intervention group. Whole frequency of fruits and vegetables did not change in the intervention group, frequencies in the control group significantly decreased (p < 0.05 between groups). The frequency of solid margarine and trans fat consumption decreased in both groups.

Clinics: changes in overall CMR

We further compared the delta between the mean levels of six months post-intervention (April–Sept. 2010) and mean levels of three months pre-intervention (Jan.–March 2010), of selected health quality measurements of the 15 clinics (10 intervention, 5 control). The data of the 93,000 customers are summarized in Fig. 3. Across the clinics, the measurement rates of height, lipids, and Hba1C increased overall and within the intervention group (p < 0.05 vs. baseline) with increased referral to angiography tests (p < 0.05 vs. control). A significant increase in both weight and blood pressure measurements was evident in both groups.

Correlations between personal HCPs’ characteristics and CMR

Within the intervention group only, the personal improvement in HCPs’ salt dietary pattern was associated with improved clinical lipid measurement rates (r = 0.71; p = 0.048), while lower HCPs’ personal body weight was associated with improved lipid (r = −0.69; p = 0.058) and blood pressure (r = −0.81; p = 0.015) CMR.

Discussion

In the PHASE trial we addressed the effect of self-experience intervention on three layers of health measurements, the HCPs, the patients, and the clinic health characteristics. We found that self-experience workshops, focusing on healthy lifestyle and behavior-modifying techniques, which are provided to the entire health professional staff of primary care clinics (e.g., physicians, nurses, clinic administrators), are effective in achieving moderate favorable personal changes, and that this effect is somewhat halved over the clinical patients and the overall clinic profile. Moreover, personal clinical staff characteristics were significantly associated with the extent of change achieved by the intervention, emphasizing the role of personal characteristics and lifestyle of the clinic staff on the efficacy of the intervention. Personal HCPs’ lifestyles (as weight and nutritional patterns) are directly correlated with their clinic’s performance. This study implies that interventions to promote health through HCPs’ self-experience are valuable to patients and clinics, suggesting an adjunct strategy in primary prevention.

Our study limitations merit some considerations. Our locally developed follow-up evaluation tools were not extensively validated, although the clarity of the questions was pretested internally following a pilot trial (Shahar et al., 2009). Furthermore, we lack assessment and follow-up of specific blood measurements of both HCPs and patients, although we have measurement rates at the clinic level. Another limitation stems from the distinctive characteristics of the program focusing on providing tools and skills for knowledge translation rather than knowledge per se. It may be beneficial in future projects to include a preliminary phase that will provide current recommendations for healthy lifestyle habits.

The strengths of the study include the unique design of a one-phase randomized controlled intervention trial, the feature of a personal lifestyle experience intervention program, the high adherence rate, the large-scale simultaneous comparisons of the three layers: health care providers, patients, clinics, the inclusion of the entire primary clinic staff (physicians, dietitians, nurses, other health promoters, administrators) in the trial and the presence of a strong and research-accessible electronic medical record system in Clalit HMO. We showed a substantial change in health promotion and health prevention activities in both groups. However, a larger and significant change was detected among the intervention group; 91% reported a considerable change in their activities (their efficiency in performing health promotion and health prevention activities following the intervention), compared to 68% among the control group. It seems that during this project, an overall moderate improvement in clinical measurements rates (CMR) was shown across all the clinics, apparently reflecting the general improvement in this HMO. Thus, the
68% improvement in the control group may reflect the “placebo effect” following the initiation of this trial across the district.

We found that the HCPs in the intervention group achieved improvement in health initiative attitudes and personal dietary patterns. In a survey (Frank et al., 2006, 2007) of 2316 medical students in the US, it was shown that medical students reported more good health behaviors, such as lack of smoking and higher engagement in physical activity, compared with other young U.S. adults. Healthier personal practices were significant predictors of counseling patients about preventive strategies. However, only 19% of the students believed that they had been adequately trained in nutrition counseling, and 17% of the senior physicians reported that they frequently counseled their patients about nutrition. Furthermore, medical students consumed an average of 3.0 fruit and vegetable servings/day, which declined over time (Frank et al., 2007). In a survey among 763 American physicians, their excessive number of work hours was associated with lack of exercise, not eating breakfast, and sleeping fewer than six hours per night. Physicians report that inadequate personal workplace nutrition has a significant negative impact on their personal wellness and professional performance (Lemaire et al., 2011). The workplace, as we showed in a previous dietary intervention trial, could be a successful platform for lifestyle intervention (Shai et al., 2008).

Among the patients, we found an overall improvement in dietary patterns, with specific advantage in salt, red meat, fruit and vegetable intake in the intervention group. Interestingly, there was a decrease in the consumption of solid margarine and trans fat in both groups. The decrease may reflect the overall increased awareness of the public to trans fat risk following massive healthy eating promotional campaigns. Noteworthy, the patients were not specifically aware of the intervention program given to their clinic staff. Patients are more likely to adopt a healthy behavior when it is recommended by their physician (Abramson et al., 2000). Data from the U.S. National Ambulatory Medical Care Survey revealed that only 16% of office visits to primary care providers included health counseling on diet, physical activity, or stress reduction (Ma et al., 2004). Some of the obstacles to increasing counseling rates are the physician’s personal lifestyle (Vickers et al., 2007) and lack of time (Douglas et al., 2006). When physicians discussed health promotion with their patients, even when the patients had already received printed materials on the same topic, those that were directly counseled by their physician were 35–55% more likely to quit smoking.
make changes to their diet, and begin exercising, compared with those who only received literature encouraging the same thing (Kreuter et al., 2000).

Across the clinics an overall moderate improvement in CMR was shown. In 53 studies assessing physician variables affecting test ordering (Sood et al., 2007), some of the recognizable physician factors include age, sex, degree of specialization, geographic location and practice setting, individual belief systems, experience, knowledge, fear of malpractice litigation, physician regret, financial and regulatory incentives, awareness of costs of tests ordered, and provision of written feedback by peers or employers. In a randomized controlled, practice-based trial among primary care physicians who underwent the strategy for different clinical problems (Verstappen et al., 2003), the authors concluded that a multifaceted strategy using guidelines, feedback, and social interaction resulted in modest improvements in test ordering by primary care physicians.

Most importantly, we found that the HCPs’ personal lifestyle pattern, including body weight, was associated with changes in CMR. In a study that was performed in Israel using objective data from Clalit HMO, CMR of physicians was compared with their patients. In nearly

Fig. 2. Patients: changes in preventive care and personal dietary patterns.
all areas, rates of physicians being screened and tested for risk factors/ diseases, and being successfully treated for them, were very similar to their patients’ rates. These findings support the possible halo effect of physicians’ health habits on their patients (Dresner et al., 2010). As reviewed elsewhere (Oberg and Frank, 2009), physicians can positively influence patients’ health habits by counseling them about prevention and health promoting behaviors. Correlations between personal practices and counseling rates have been found consistently across prevention and health promotion topics (Frank et al., 2010). However, health promotion in physician organizations is still apparently low; results from a U.S. National Study of Physician Organizations (McMenamin et al., 2004) among 1104 doctors revealed that, overall, 60% of physician organizations offer at least one health promotion program targeting one or more of eight areas: prenatal education (42%), smoking cessation (39%), nutrition (39%), weight loss (34%), health risk assessments (25%), stress management (25%), substance abuse (20%), and sexually transmitted disease prevention (16%). Yet, physicians report difficulty counseling patients about behaviors they themselves do not practice (Frank, 2004; Vickers et al., 2007). Our findings suggest a direct association between personal health care characteristics and clinic performance.

In summary, healthcare providers’ improved wellbeing and lifestyle are important and are cascaded to the patients and clinics, suggesting an additional strategy to achieve successful health promotion. More focused interventions that will include both knowledge and knowledge translation methods may further improve efficacy.

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Conflict of interest statement
The authors declare that there are no conflicts of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.ypmed.2012.08.001.

References