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# Components of a successful intervention for monthly skin self-examination for early detection of melanoma: The “Check It Out” Trial

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**Background:** Multicomponent Check-It-Out project interventions were found to be effective at increasing thorough skin self-examinations (TSSE). Application of this research will benefit from determining the most important interventions for promoting TSSE.

**Objective:** Identification of the most important Check-It-Out intervention components for promoting TSSE.

**Methods:** This study analyzed the responses of the 567 participants who were randomized into the skin examination intervention group and who did not report performing TSSE at their baseline interview.

**Results:** Watching the video, using the hand mirror, shower card, American Cancer Society brochure, sample photographs, and finding the health educator helpful were associated with performing TSSE at 2 months, 12 months, or both.

**Limitations:** Use of the materials within the skin group was not randomly assigned. All data were based on participant self-report.

**Conclusions:** As future interventions to increase TSSE are developed, the identified useful components will be important to include. (*J Am Acad Dermatol* 2008;58:1006-12.)

## INTRODUCTION

Melanoma remains a serious public health problem with an estimated 62,480 cases and 8420 melanoma deaths in 2008.<sup>1</sup> Melanomas most frequently occur on visible skin surfaces, including the trunk, head, and neck in men and the trunk and legs in women. Early detection may be instrumental in reducing melanoma mortality and is widely recommended

### Abbreviations used:

ACS: American Cancer Society  
TSSE: thorough skin self-examination

for that purpose. Strategies to increase early detection include professional skin examinations as well as monthly thorough skin self-examination (TSSE).<sup>2</sup>

Those who receive physician advice, have a wall mirror, and an available partner are more likely to perform TSSE.<sup>3</sup> A successful intervention was conducted (The Check-It-Out Project), which included instructional materials, cues and aids, health educator counseling, and follow-up letters, to effectively increase the performance of TSSE.<sup>4</sup> This report explores the use of the various components of the Check-It-Out intervention and their associations with subsequent performance of successful TSSE in patients who were not previously performing TSSE.

## METHODS

### Recruitment and sample

Data analyzed were collected during the Check-It-Out Project, a randomized trial of an intervention developed to increase TSSE performance. The study

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participants were recruited from primary care practices in Rhode Island and southeastern Massachusetts between May 2000 and December 2001. Participants were randomly assigned to one of two experimental groups: one that encouraged increasing TSSE performances and one that encouraged improvement of diet. Details of recruitment, study procedures, and patient population have been previously described.<sup>4,5</sup> The analyses for this article were restricted to those 567 participants who were randomized into the skin examination group and who did not report performing TSSE at their baseline interview. Appropriate approvals from relevant institutional review boards and signed informed consents from participants were obtained.

### **Interventions**

Participants in the skin examination group received an intervention directed at increasing TSSE performance for early detection of malignant melanoma. The intervention materials included educational materials, cues, aids, and a brief counseling session by a health educator. Their physicians did not participate in the intervention and were blinded to the group to which the participant was randomized. The content of the interventions were created or adapted by the project team and were guided by the transtheoretical model stages-of-adoption perspective, as previously described.<sup>4</sup>

### **Educational materials**

The educational materials included the video "Check It Out: Why and How to do Skin Self-Exam,"\* the American Cancer Society (ACS) brochure "Why You Should Know About Melanoma,"<sup>6</sup> and sample photographs of skin cancers. These materials advocated monthly TSSE with physician consultation for any new or changing skin lesions. The video contained motivational messages as well as specific "how-to" instructions and demonstrations for how to perform a skin self-examination. The sample photographs included pictures of actual skin cancers with descriptions of common appearances of basal cell carcinoma, squamous cell carcinoma, and malignant melanoma.

### **Environmental cues**

Environmental cues to action included a refrigerator magnet and a shower card. The refrigerator magnet was in the shape of a hand mirror and included the study logo. The shower card included

directions for performing a TSSE on one side and warning signs for melanoma on the other side.

### **Aids**

Aids to help perform self-examinations included a hand mirror and a body diagram for noting locations of individual lesions.

### **Health educator counseling session**

The brief counseling session for participants consisted of one-on-one sessions with the health educator and included assessment of current practice, motivating factors for performance of TSSE, barriers to improvement, and agreement between the participant and health educator on an action plan. The action plan was created on the basis of the principles of social cognitive theory, which emphasizes the need to provide a clear plan for behavior change. The health educator made a follow-up call 3 weeks later to discuss the participant's progress.

### **Feedback letters**

After the 2- and 6-month interviews, each participant also received a feedback letter individually tailored to their TSSE performance, perceived risk of skin cancer, intention to perform TSSE, and availability of a partner to help with TSSE.

### **Measures**

Follow-up telephone interviews were scheduled with all participants at 2, 6, and 12 months after randomization. TSSE was defined by those who responded "once" or more times to questions regarding whether or not they carefully examined each of 7 areas of the body (the front of you from the waist up, the front of your thighs and legs, the bottoms of your feet, your calves, the back of your thighs, your buttocks and lower parts of your back, and your upper back).

At 2 months, participants were asked to respond to the question "How much of the video that the health educator gave you did you watch?" on a 1 to 4 scale from "all" to "none." At 12 months respondents reported whether or not they had used the following items that the health educator gave them: hand mirror, shower card, refrigerator magnet, ACS brochure, and sample photographs. They also reported how helpful they thought the item was in helping them to perform a thorough skin examination on a scale of 1 to 3 from "very helpful" to "not helpful." Participants were also asked to rate how helpful it was to meet with the health educator on a scale of 1 to 4 from "very helpful" to "not helpful at all" and to indicate "yes" or "no" if they thought the materials would have worked the same if they were

\*The video can be ordered from the American Cancer Society (ACS code 2301.05).

received without a meeting with the health educator. They also indicated whether or not they received and read the follow up letters and rated the helpfulness of the follow up letters on a 1 to 4 scale from “very helpful” to “not helpful at all.”

Use of the intervention materials by demographic characteristics, perceived and estimated skin cancer risk, and the previously identified baseline TSSE predictors (receiving physician advice, having a wall mirror, and having an available partner) were assessed. The demographic characteristics, perceived and estimated skin cancer risk, and baseline TSSE predictors have been previously described.<sup>3</sup> For the univariate analyses, responses to questions regarding amount of video watched and whether or not participants found the health educator helpful were recoded into dichotomous variables. Amount of video watched response choices ‘all,’ ‘some,’ and ‘a little’ were recoded into “Yes,” and ‘none’ was recoded into “No.” Responses to helpfulness of the health educator were recoded “No” for ‘not very helpful’ or ‘not helpful,’ and “Yes” for ‘very helpful’ or ‘helpful.’ All responses originally entered as “doesn’t remember,” “don’t know,” or “refused” were recoded as missing for the univariate analyses.

### Statistical analysis

Comparison of groups on categorical variables were assessed using chi-square analyses and age was analyzed as a continuous variable using Pearson product-moment correlations. Associations of use of materials and helpfulness of materials with performance of TSSE were assessed by using logistic regression. Statistical analyses were performed by means of STATA 8.0.

## RESULTS

### Participants

The Check-It-Out project enrolled 1356 participants who were recruited from 11 practices; 688 were randomized to the skin group. The study population is described in more detail in a previous report.<sup>5</sup>

The analysis reported herein is restricted to 567 participants in the skin group who were not performing TSSE at baseline (82% of those randomized to the skin group). By 2, 6, and 12 months after randomization, 47%, 50%, and 49%, respectively, of those not reporting TSSE at baseline were performing TSSE.

### Overall use of materials

At 2 months, 50% of the participants had watched all the video and an additional 16% reported watching some of the video (Table I). At 12 months most participants reported using the hand mirror, ACS

**Table I.** Use of video: How much of the video that the health educator gave you did you watch?

No. of respondents	All (%)	Some (%)	A little (%)	None (%)	Don't know/Refused (%)
325	50	8	8	32	1

brochure, and sample photographs; and approximately one third reported using the shower card and the refrigerator magnet. Except for the refrigerator magnet, most of the participants reported that each of the components of the intervention was very helpful in performing a TSSE (Table II).

About half of the participants found the meeting with the health educator helpful. One third found it very helpful and most felt that this meeting affected how they used the materials. Two thirds of the participants reported reading the follow-up letters and about half of those found those somewhat helpful (Fig 1).

### Predictors of using materials

Table III displays the reported use of the video at 2 months after the intervention by demographic characteristics (age, gender, education), perceived and estimated skin cancer risk, and previously noted predictors of TSSE (receiving physician advice, availability of a partner, availability of a wall mirror). Respondents who reported watching the video were on average 3.5 years older. None of the other factors examined were associated with watching the video.

The demographic characteristics, perceived and estimated skin cancer risk, and TSSE predictors were also examined with use of specific intervention materials other than the video, reported helpfulness of the health educator, and reported use of the follow-up letters. Respondents who found the health educator helpful were more likely to be less educated, to have received physician advice to perform skin self-examination, and to have a lower perceived skin cancer risk. More women than men reported using the shower card and refrigerator magnet. Respondents using the ACS brochure were older than those who did not use the brochure. None of the other demographic factors or TSSE predictors were associated with finding the health educator helpful, reading the letters, or using the other materials (see Table III).

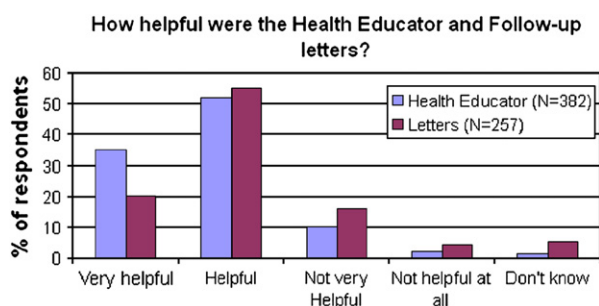
### Associations of intervention components with TSSE performance

We assessed multiple components of the intervention for the associations of the reported use or helpfulness with performance of TSSE. Use of the hand mirror was the single component most strongly associated with performance of TSSE at both 2 and 12

**Table II.** Use and helpfulness of materials

	Have you used the items that the health educator gave you at the beginning of the project?				How helpful was the item in helping you to do a thorough skin examination? Would you say...				
	No.	Yes (%)	No (%)	Don't know/Refused (%)	No.	Very helpful (%)	Somewhat helpful (%)	Not helpful (%)	Don't know/Refused (%)
Hand mirror	382	86	14	0	327	69	30	1	0
Shower card	382	29	68	4	110	57	37	5	0
Refrigerator magnet	382	33	65	2	127	37	46	16	1
ACS brochure	382	63	35	2	240	59	37	3	1
Sample photos	382	73	25	2	278	68	31	1	0

ACS, American Cancer Society.



**Fig 1.** Helpfulness of health educator and letters. *Note:* Fifty-eight percent of respondents felt the materials would not have worked the same if they had been received without a health educator meeting. Sixty-seven percent of respondents received and read the follow-up letters.

months. Other components significantly associated with TSSE at both time points included watching the video and using the ACS brochure. Finding the health educator helpful and using the shower card was associated with performing TSSE at 12 months, and using the sample photographs was associated with performing TSSE at 2 months. Using the refrigerator magnet and reading the follow up letters were not significantly associated with performing TSSE at either time point (Table IV).

**DISCUSSION**

Although melanoma remains a growing problem worldwide, it is curable if detected and excised at an early stage. Monthly TSSE has been associated with reduced melanoma mortality.<sup>7</sup> It has been previously shown that the Check-It-Out intervention produced a sustained increase in the performance of skin self-examinations with only a transient increase in skin surgeries.<sup>4</sup> The goal of this study was to examine the use and perceived helpfulness of the Check-It-Out intervention components and their associations with adopting the practice of TSSE.

We identified intervention components that may be particularly important in promoting TSSE

performance in patients currently not performing TSSE. The video was watched by a majority of the participants and more participants reported using the hand mirror than any other item. The ACS brochure and sample photographs were also used by a majority of the participants, whereas the shower card and refrigerator magnet were used by about one third of the respondents. Most respondents found the hand mirror, shower card, ACS brochure, and sample photographs very helpful.

The low percentage of patients reporting using the shower card (29%), given the finding that use of the shower card was associated with performing TSSE at 12 months, suggests that skin examination reminders and cues may be effective for increasing TSSE, even though fewer patients report using them. The higher percentage of patients reporting using the hand mirror, ACS brochure, and sample photographs may be due to the use of these materials by patients to perform or to learn how to perform skin examinations. Previous reports have also documented the utility of photographs to augment the performance of skin self-examinations.<sup>8</sup> The strong association of using the hand mirror with performing TSSE suggests that interventions to enhance TSSE behavior should directly address the need for skin self-examination aids.

Our finding that older persons were more likely to use the video and ACS brochure is particularly relevant for skin cancer prevention as melanoma incidence and mortality increase with age.<sup>9</sup> The finding that the shower card and refrigerator magnet were more likely to be used by women than by men suggests that cues targeted to men would be useful in developing future interventions. This type of targeting is appropriate since melanoma mortality is particularly high in older men.<sup>10</sup>

Less highly educated participants reported greater helpfulness of the health educator, which may be due to lack of previous exposure for this group, and the more highly educated patients finding the

**Table III.** Associations of intervention components with demographics and TSSE predictors\*

	Did you watch the video?			Did you find the health educator helpful?			Did you read the follow-up letters?			Did you use the hand mirror?			Did you use the shower card?			Did you use the refrigerator magnet?			Did you use the ACS brochure?			Did you use the sample photos?		
	No	Yes	P	No	Yes	P	No	Yes	P	No	Yes	P	No	Yes	P	No	Yes	P	No	Yes	P	No	Yes	P
Education, No.	108	214	.80	46	334	.03	62	257	.50	55	327	.133	258	110	.50	247	127	.70	133	240	.20	97	278	.60
Less than HS	7	9		0	6		10	5		2	6		5	7		5	6		5	5		4	5	
HS grad	22	27		17	27		26	25		25	26		25	25		27	23		33	23		30	24	
After HS	29	26		24	28		26	30		20	30		27	31		27	32		26	30		92	28	
College	42	38		59	38		39	40		53	38		43	36		42	39		36	42		27	42	
Age, No.	108	214	.036	46	334		62	257		55	327		258	110		247	127		133	240		97	278	
Mean age (y)	50.8	54.3		52.1	55.1	.16	53.8	54.7	.90	53.1	55.1	.30	53.6	56.5	.06	54.7	54.7	1.00	52.8	55.9	.047	54.1	54.9	0.60
Gender, No.	108	214	.80	46	334	.7	62	257	.50	55	327	.098	258	110	.03	247	127	.023	133	240	.20	97	279	.80
Male	47	48		43	47		48	43		56	44		50	37		50	38		50	44		47	48	
Female	53	54		57	53		52	57		44	56		50	63		50	62		50	56		53	54	
Perceived risk, No.	104	207	.90	46	326	.037	59	254	.30	54	320	1.00	253	107	.20	241	125	.30	127	238	.059	97	270	.20
Very high	6	6		7	8		3	7		7	6		7	5		7	6		4	8		9	6	
High	13	12		20	12		20	12		13	13		12	13		12	14		7	15		16	11	
Moderate	45	43		59	43		37	46		46	45		43	47		42	50		47	45		37	49	
Low	24	24		9	23		24	21		19	22		21	27		22	22		26	19		22	22	
Very low	12	15		7	15		15	15		15	14		17	8		17	9		15	13		15	13	
Estimated risk, No.	107	213	.60	43	332	.90	62	254	.70	55	322	.40	254	108	1.00	242	127	.90	131	237	.30	95	275	.09
High	22	26		23	24		19	24		22	25		25	24		24	26		21	26		33	21	
Moderate	32	32		30	33		35	33		27	34		32	32		33	32		31	35		29	34	
Low	47	42		47	42		45	43		51	41		43	44		43	42		48	39		38	44	
Dr. advice, No.	104	211	1.00	46	326	.049	61	251	0.90	54	320	.60	255	108	.20	240	126	.082	131	235	.30	93	274	.60
No	65	65		80	66		67	68		64	68		70	64		71	62		71	66		70	67	
Yes	35	35		20	34		33	32		35	32		30	36		29	38		29	34		30	33	
Wall mirror, No.	108	214	.062	46	334	.80	62	257	.80	55	327	.60	258	110	.80	247	127	.19	133	240	.80	97	278	.30
No	28	19		20	21		21	20		24	20		21	23		19	24		22	20		25	20	
Yes	72	81		80	79		79	80		76	80		79	77		81	76		78	80		75	80	
Partner, No.	108	214	.30	46	334	.20	62	257	.40	55	327	.30	258	110	.70	247	127	.60	133	240	.70	97	278	.40
No	10	14		11	18		21	17		22	17		16	17		16	18		16	18		20	16	
Yes	90	86		89	82		79	83		78	83		84	83		84	82		84	83		80	84	

ACS, American Cancer Society; HS, high school; TSSE, thorough skin self-examination.

Notes : After HS, some education after HS; College, college graduate; Dr advice, received physician advice to perform skin self-exam; Wall mirror, availability of a wall mirror; Partner, availability of a partner; No, not very or not helpful; Yes, very helpful/helpful.

\*Data expressed as percentage of respondents in each response category unless otherwise specified.

**Table IV.** Associations of intervention components with TSSE performance

Time point of TSSE	Odds ratio (95% confidence interval)							
	Did you watch the video?	Did you find the health educator helpful?*	Did you read the follow-up letters?	Did you use the hand mirror?	Did you use the shower card?	Did you use the refrigerator magnet?	Did you use the ACS brochure?	Did you use the sample photos?
12 mo	1.8 (1.0-3.0)	2.2 (1.1-4.2)	1.6 (0.91-2.8)	3.0 (1.6-5.6)	2.1 (1.3-3.3)	1.2 (0.8-1.9)	1.6 (1.1-2.5)	1.4 (0.86-2.2)
2 mo	2.7 (1.7-4.4)	1.7 (0.87-3.5)	1.4 (0.76-2.5)	3.0 (1.5-5.8)	1.4 (0.87-2.2)	1.2 (0.77-1.9)	1.9 (1.2-3.0)	2.0 (1.2-3.3)

ACS, American Cancer Society; TSSE, thorough skin self-examination.

\*No, not very helpful or not helpful; Yes, very helpful or helpful. Response values: No = 0; Yes = 1.

messages of the health educator redundant with other materials they received or representing concepts they already knew. Patients who reported lower perceived skin cancer risk may have not previously been exposed to skin cancer education and were more receptive to the messages of the health educator. The observation that respondents who found the health educator helpful were more likely to report receiving physician advice may indicate that the health educator messages serve to effectively reinforce physician messages. This finding has implications for development of future physician and health educator collaborations to more effectively persuade patients to adopt health prevention behaviors.

This study has several limitations. Although the overall initial study population was randomized into skin and diet groups, use of the provided materials was determined by the participant and not randomly assigned. Furthermore, the causal sequence of using the intervention materials and performing TSSE is uncertain. For example, the provision of a hand mirror might have been a motivating factor in performing TSSE, or an implement of convenience to complete TSSE that was otherwise motivated. With these data, we are only able to make associations and cannot infer that particular intervention materials caused patients to perform TSSE, although the overall intervention did. The data from this analysis also relied on self-report of using the intervention materials and TSSE performance, and we were not able to verify that respondents actually used the materials and performed TSSE. In addition, while skin self-examination may decrease melanoma mortality, its usefulness may be dependent on the ability of individuals to obtain medical care, which was available to participants in this study since they were recruited at the time of a medical visit. Finally, the health educators used in the study trained with a semistructured scripted interview, but they were not trained to adhere to a formal script. The same 3 health educators were used throughout the study at all sites and all patients were randomized without regard to the assignment of the health

educator; however, variability among the 3 educators was not controlled for by the study and was not measured.

A strength of this study is that it is based within a randomized controlled trial in which the intervention was proven effective. In addition, because participants were recruited from primary care physician practices and were not restricted to high-risk individuals, these results are potentially applicable to a general patient population. The identification of the most useful components may be directly applicable to clinical and health educator practices.

Skin self-examination is a promising practice to decrease mortality associated with melanoma. We conducted a successful intervention to increase the performance of TSSEs. These analyses identify which components of the intervention were most important so that future interventions may be further improved. Improved efforts to facilitate behavioral change in patients currently not performing TSSE may be instrumental to increasing earlier detection of skin cancer.

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