The use of mole-mapping diagrams to increase skin self-examination accuracy

Victoria Chiu, AB,[a,b] Elizabeth Won, AB,[a,b] Mohsin Malik, ScB,[a,b]
and Martin A. Weinstock, MD, PhD[a,b,c]
Providence, Rhode Island

Background: Monthly skin self-examination (SSE) is associated with reduced incidence of advanced melanoma, but SSE is prone to error in detecting early changes of melanoma.

Objective: We sought to improve SSE accuracy by requiring participants to complete a mole-mapping diagram.

Methods: After completing a baseline survey, participants received SSE instruction, had their backs digitally photographed, and half were randomized to complete a mole-mapping diagram. Some photographs were altered by adding an image of a 5-mm pigmented lesion. At follow-up, participants were asked to identify any changes introduced to their photographs.

Results: A total of 88 participants completed the study. In all, 33% (n = 15) of the control group (no diagram) and 52% (n = 22) of the intervention group (mole-mapping diagram) (P = .06) gave accurate assessments. Analysis of only altered images indicated that the intervention group gave more accurate assessments (60% vs 33%, P = .01).

Limitations: This study was limited by sample size, only addressed lesions on the back, and did not involve actual melanomas in study participants.

Conclusions: Mole-mapping diagrams may improve SSE accuracy, and may be useful as a simple, cost-effective intervention in reducing melanoma mortality. (J Am Acad Dermatol 2006;55:245-50.)

Melanoma is currently the fifth and sixth most common cancer among men and women in the United States, respectively. The rates have increased substantially during recent decades and this increase is hypothesized to be primarily a result of UV radiation exposure from the sun.[1] However, case fatality has decreased in recent decades, and overall mortality from melanoma is leveling off after decades of increases. Early detection is key to long-term survival as stage-IA melanomas (tumor thickness < 1.0 mm and no ulceration) have a 10-year survival of 88%.[2] It has been reported that most melanomas are discovered by the patient[3,4]; therefore, it appears that self-screenings may be effective in improving long-term survival. Monthly skin self-examination (SSE) has been associated with reduced incidence of advanced disease among patients with melanoma[5]; however, studies have indicated that the SSE as currently performed is not optimal for detecting early melanoma changes.[4-6]

In a pilot study conducted at our Veterans' Affairs Medical Center, a test for SSE accuracy was developed.[7] In the current effort, in addition to viewing an instructional videotape on SSE, participants had their backs digitally photographed. These photographs were altered on the computer to introduce an early sign of melanoma and participants were shown the altered photographs to test their ability to detect this artificial change.

This study sought to improve SSE accuracy by a simple and cost-effective intervention: requesting

From the Department of Dermatology, Brown Medical School[a]; Dermatoepidemiology Unit Veterans Affairs Medical Center[b]; and Department of Dermatology, Rhode Island Hospital.[c]

Supported by the Summer Research Assistantship from Brown Medical School (Ms Chiu), the American Academy of Dermatology Minority Medical Student Mentor Program (Mr Malik), and grants from the Department of Veteran Affairs (CSP402) and the National Cancer Institute (RO1CA106592) (Dr Weinstock).

Conflicts of interest: None identified.

Accepted for publication February 7, 2006.

Reprint requests: Victoria Chiu, AB, 343 Lloyd Ave, Providence, RI 02906.

Published online May 16, 2006.

0190-9622/$32.00

doi:10.1016/j.jaad.2006.02.026

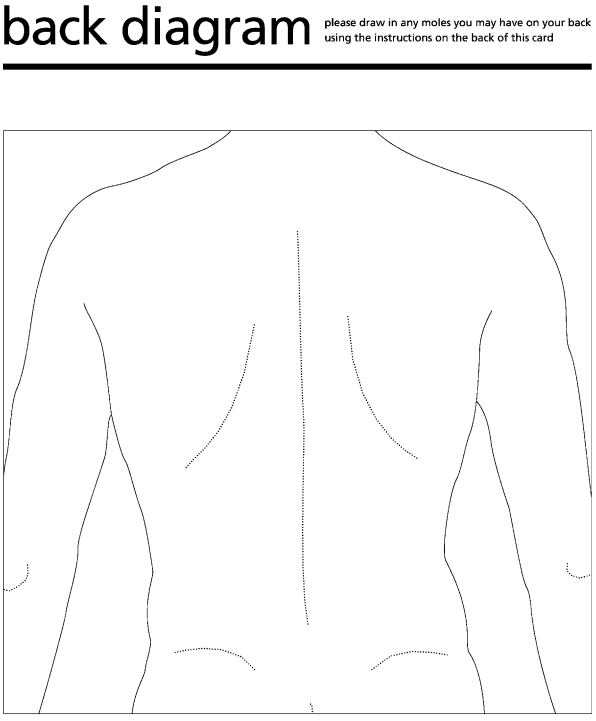

Fig 1. Mole-mapping diagram given to intervention group.

participants fill out a mole-mapping diagram of their backs. We also hypothesized that it may increase performance of SSE. If effective, this intervention could be disseminated widely with relative ease.

METHODS

Study population

The participants were recruited from the community and a veterans' clinic settings by soliciting patients at least 18 years of age who were waiting for their primary care appointment. The size of the study population was limited by the availability of research personnel. The investigator explained the study and obtained informed consent.

After appointments with physicians, the participants completed a 24-question survey regarding SSE attitudes, skin cancer history, and demographic information.

All participants had photographs of their backs taken with a digital camera (C5060, Olympus America Inc, Melville, NY) at a resolution of 2592 × 1914 pixels stored in JPG format. Two 500-W tungsten light sources with diffusers were aimed at each participant at an angle of approximately 45 degrees from either side to provide standardized lighting conditions between participants. Ambient fluorescent lighting was used as well. The camera was white balance–adjusted before the photographs were taken. One photograph was taken of the upper half and one of the lower half of the back with as little overlap as possible. One additional photograph was taken of the whole back but was not shown to the participants at follow-up visit. The whole-back photograph included a metric ruler to standardize the scaling of the photographs during subsequent manipulation.

All participants then viewed a 14-minute video entitled "Protecting Yourself from Melanoma with the Skin Self-Exam," originally developed for the Check It Out Project.[8] In addition, all participants received the American Cancer Society brochure "Why You Should Know About Melanoma."[9] All participants were instructed to perform the SSE in the fashion demonstrated in the video and brochure before their follow-up visit.

Participants were then randomized to control or intervention groups by a random draw of an envelope, which contained either a blank sheet of paper or the mole-mapping diagram. The intervention group then received a mole-mapping diagram on a 8.5- × 11-in sheet of paper that consisted of a computer-generated generalized form of the torso (Fig 1). They were instructed to draw their moles on the diagram before their return visit in 2 weeks.

Photograph manipulation

The participants' photographs were randomized by a computerized random number generator to have either one photograph altered (two thirds of participants) or both photographs altered (one third of participants). The photographs were processed using software (Photoshop 6.0, Adobe Systems Inc, San Jose, Calif) by a method developed by our team.[7] Alteration consisted of having one image of a pigmented lesion added from a bank of images generated from a single lesion that was color adjusted using the hue/saturation/value image adjustment tool to generate different shades. The image chosen to be added matched one of the participant's own nevi if there were any in the photograph, and was resized to represent a 5-mm new lesion on the participant's back (Fig 2).

Photographs of file size of 2272 × 1704 pixels were printed using a color laser printer (Magicolor 3100, Konica Minolta Printing Solutions USA Inc, Mobile, Ala) onto 8.5- × 11-in glossy photo laser paper (Hammermill, International Paper, Memphis, Tenn), leaving approximately 0.25-in margins on all sides of the print.

The follow-up visit was scheduled approximately 2 weeks after the initial visit. An 11-question survey was then administered to the participants about their attitudes and practices regarding SSE. The