Abstract

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Most people have heard the letters "UV" used together, but many may not know what it actually means. "UV" stands for ultraviolet. There are two types of UV rays: UVA and UVB. There are many factors that lead to UV exposure. The top two factors that affect everyone are the time of day and the season. Other factors include the distance from the equator, altitude, the amount of cloud coverage, and exposure to reflective surfaces, like sand, snow, or water. Sun exposure adds up day after day and happens every time people are in the sun. People can also be unaware that they are causing damage to their skin even if it does not result in a "sunburn" as well as still get a sunburn on cloudy days.

The purpose of the experiment was to highlight the seriousness of sun damage on protected, unprotected, covered, and uncovered skin when exposed to the sun's harmful rays. The goal was to see which SPF (or colored cloth) provided the most protection from the rays. These findings would show the general public how important it is to be aware of the damage and to actively protect their skin from the UV rays.

The experiment was conducted by constructing a light proof box and mounting a UV light within the box, followed by covering a piece of glass with the following variables: white cloth, black cloth, SPF 4, SPF 15, SPF 30, SPF 50, SPF 70, and SPF 100. Then a UV meter was placed under the covered glass and then recorded the UV light amount. This was repeated for each variable for a total of 3 trials.

The hypothesis was that the 100 SPF sunscreen will block the most UV rays during the experiment was not supported. The most successful SPF was the SPF 70 sunscreen with an average of 0.67 microwatt per square centimeter, which is expressed as $\mu W/cm^2$. This was followed by the white cloth at 1 $\mu W/cm^2$. This means that both of these variables reflected most of the UV rays as opposed to absorbing them. The lower the number is, the less it absorbed. This is supported by the notion that white reflects light while black absorbs light and was supported by the results seen in the black and white cloth trials. The second part of the hypothesis that the control, or no type of protection, will provide the highest UV reading was also not supported. SPF 4 sunscreen allowed the most UV light rays to pass with an average reading of 12 $\mu W/cm^2$ compared to the average the control (no protection) received with 11.33 $\mu W/cm^2$. This might be because the SPF 4 sunscreen was also a tanning lotion and intensified the UV rays. Sunscreen with SPF 30, or greater, blocked over 50% of the harmful UV rays along with other protection, such as a t-shirt. More research needs to be conducted on why the SPF 100 was not as effective as the SPF 70.