

**THE SUN LESS STUDY: A  
RANDOMIZED TRIAL OF A SKIN  
CANCER PREVENTION  
INTERVENTION FEATURING  
SUNLESS TANNING**

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# RATIONALE

- The desire to be a tan is a strong motivator to sunbathe
- People desiring a tan tend to be resistant to sun safety messages
- Difficult to reduce the desire to be tan!
- Sun tanning alternatives might be a different approach
  - If you can't beat, join em?



# SUNLESS TANNING

- Sunless tanning are a non-UV tan alternative
  - Products containing dihydroxyacetone (DHA), a colorless vegetable-derived sugar that interacts with dead surface cells in the epidermis to stain the skin a tan color
  - Creams, foams, or sprays applied professionally
- Not a source of sun protection
- Relatively inexpensive alternative to indoor tanning (\$5 for bottle, \$30 for a spray)



# EVERYBODY'S DOING IT...



HERE'S THE ALTERNATIVE!



# SUNLESS TANNING HELPFUL OR HARMFUL?

- People attending a sunless tanning visit reported intentions to reduce their indoor tanning but not their outdoor tanning (Sheehan & Lesher, 2005)
- Sunless tanning users reported more use of indoor tanning and more burns than nonusers (Brooks et al 2006)
- Intervention promoting sunless tanning as part of a sun safety message found increases in sun protection but no effect on sunbathing (Mahler et al 2005)



# AIMS

- To compare a multi-component beach-based intervention featuring sunless tanning as a substitute for sunbathing to a survey-only control condition on sunbathing 2-months following the intervention.
- Secondary outcomes include frequency of sunburns, use of sunless tanning products, and sun protection.



# SETTING

- Massachusetts public beaches (Nantasket and Revere beaches)
- Beaches were 27 miles apart and randomly assigned as intervention or control on each of 11 days of data collection (average temp 78F)
- Randomization by beach allowed weather conditions and day to be held constant.



# RECRUITMENT

- Study site was set up in a central location at each beach.
- Research assistants actively approached female beach visitors to participate in a study about sun habits.
- Interested intervention participants were asked to have a seat in the tent to complete informed consent, questionnaires, and a brief intervention.
- Interested control participants were asked to complete informed consent and questionnaires.



# MEASURES

- **Sunbathing**

*In the last 2 months, how often did you spend time in the sun in order to get a tan?*

0 = never, 1 = once, 2 = once a month, 3 = twice a month, 4 = once a week, 5 = twice a week, 6 = almost every day and 7 = everyday.

- **Sunburns**

*In the last 2 months, how many times did you have a red OR painful sunburn that lasted a day or more?*

0 = not at all, 1 = once, 2 = twice, 3 = three times, 4 = four times and 5 = five times or more

- **Sun protection**

*Think about what you do when you are outside during the summer, how often do you: wear sunscreen or non-sunscreen protection (shirt with sleeves, hat, sunglasses, shade, umbrella).*

0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = always



## MEASURES (CONT)

- **Sunless tanning behavior**

*Sunless tanning, also known as self-tanning or fake tanning, involves the application of creams, foams, sprays that dye skin a tanned color, or spray tans that you can get at a tanning business. These do NOT include bronzing powders and creams which can be washed off with soap and water.*

*Have you used sunless tanning products or spray-on tans in the last 2 months?“*

Yes or No



## MEASURES (CONT)

- Indoor tanning

*Have you used an indoor UV tanning device in the last two months?*

Yes or No



# INTERVENTION

- Completed questionnaires
- Took a UV instant photo
- Skin cancer pamphlet
  - Skin cancer rates
  - Skin cancer detection, types, and symptoms
  - Skin cancer prevention
  - Suntanning Myths
  - Graphic photos of skin with heavy UV damage
  - Graphic photos of skin cancer lesions and scars
  - Attractive photos of women with protective clothing, using umbrellas and tents
- Free sunscreen sample with verbal and written instructions for use







# INTERVENTION (CONT)

- Free sunless tanning cream sample with verbal instructions for use
- Application of sunless tanning cream to small area of skin to demonstrate the color.
- Sunless tanning pamphlet
  - General information about sunless tanning
  - Application instructions for sunless tanning creams including common application errors
  - Attractive photos of women before and after sunless tans





# INTERVENTION (CONT)

- Show them their standard and UV photos and give them copies to take home.



# CONTROL CONDITION

- Completed the same questionnaires
- Received a free gift pack
  - Beauty product samples
  - Candy, snacks



# FOLLOW-UP

- Participants were contacted via the information they provided
  - Email
  - Phone
  - Home address
- 1-month following the beach contact.
- They were re-contacted in 1 week if no response, then in 2 weeks if no response, then in 3 weeks, etc.
- 77% completed follow-up at the end of the summer



<b>N=250</b>	
<b>Age</b>	M=31.21 (sd = 12.36)
<b>Ethnicity</b>	
<b>Caucasian</b>	85%
<b>Hispanic</b>	5% (4% multiracial)
<b>African American</b>	2%
<b>Education</b>	
<b>Less than college degree</b>	63%
<b>College degree</b>	22%
<b>Graduate degree</b>	12%
<b>Skin Type</b>	
<b>I</b>	8%
<b>II</b>	26%
<b>III</b>	45%
<b>IV</b>	21%
<b>Family hx of skin cancer</b>	30%
<b>Personal hx of skin cancer</b>	3%

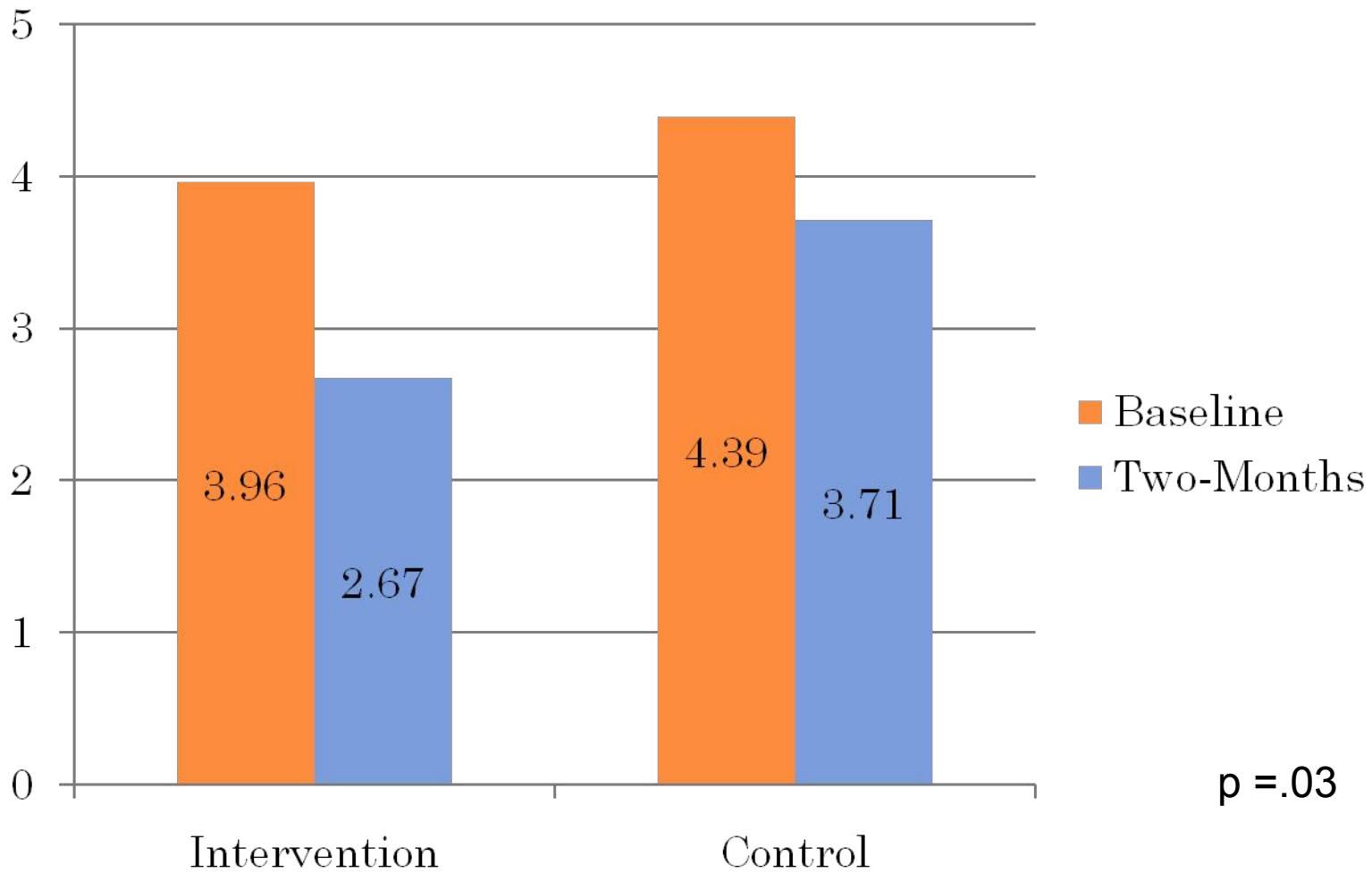


# RESULTS

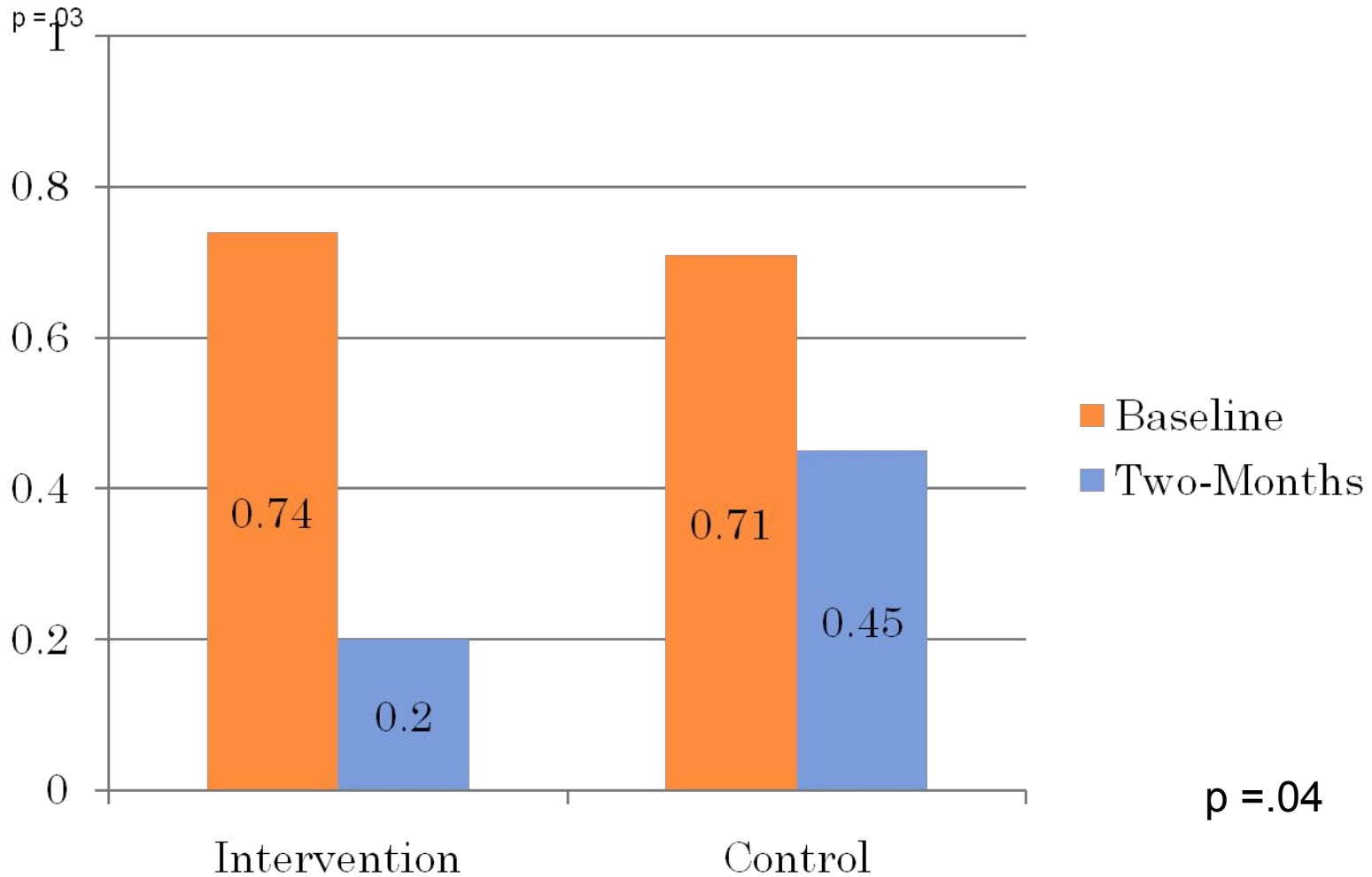
- Intention to treat analyses using mixed effects regression modeling with a random intercepts trend
- Age and skin type were covariates



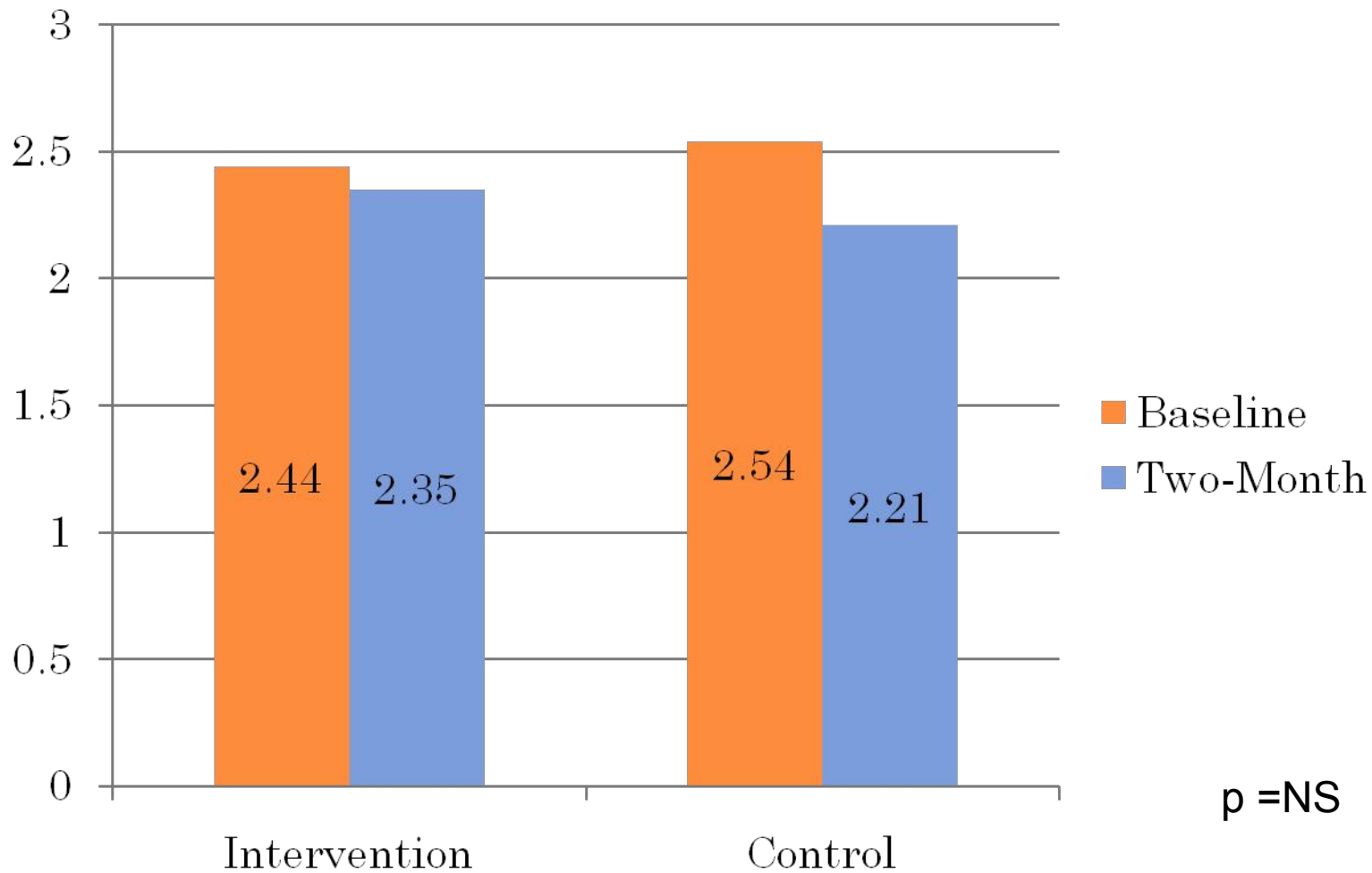
# SUNBATHING



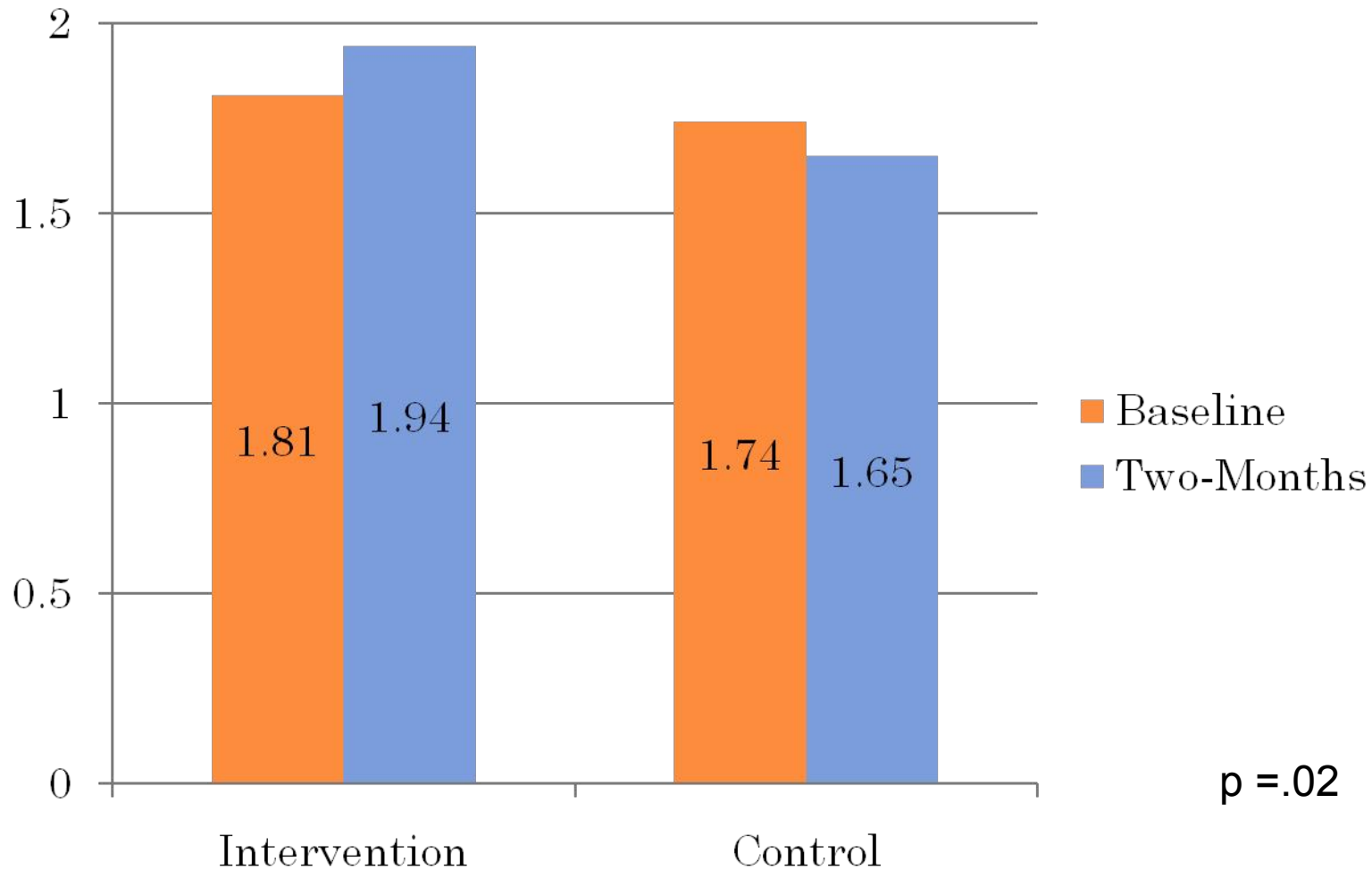
# SUNBURNS



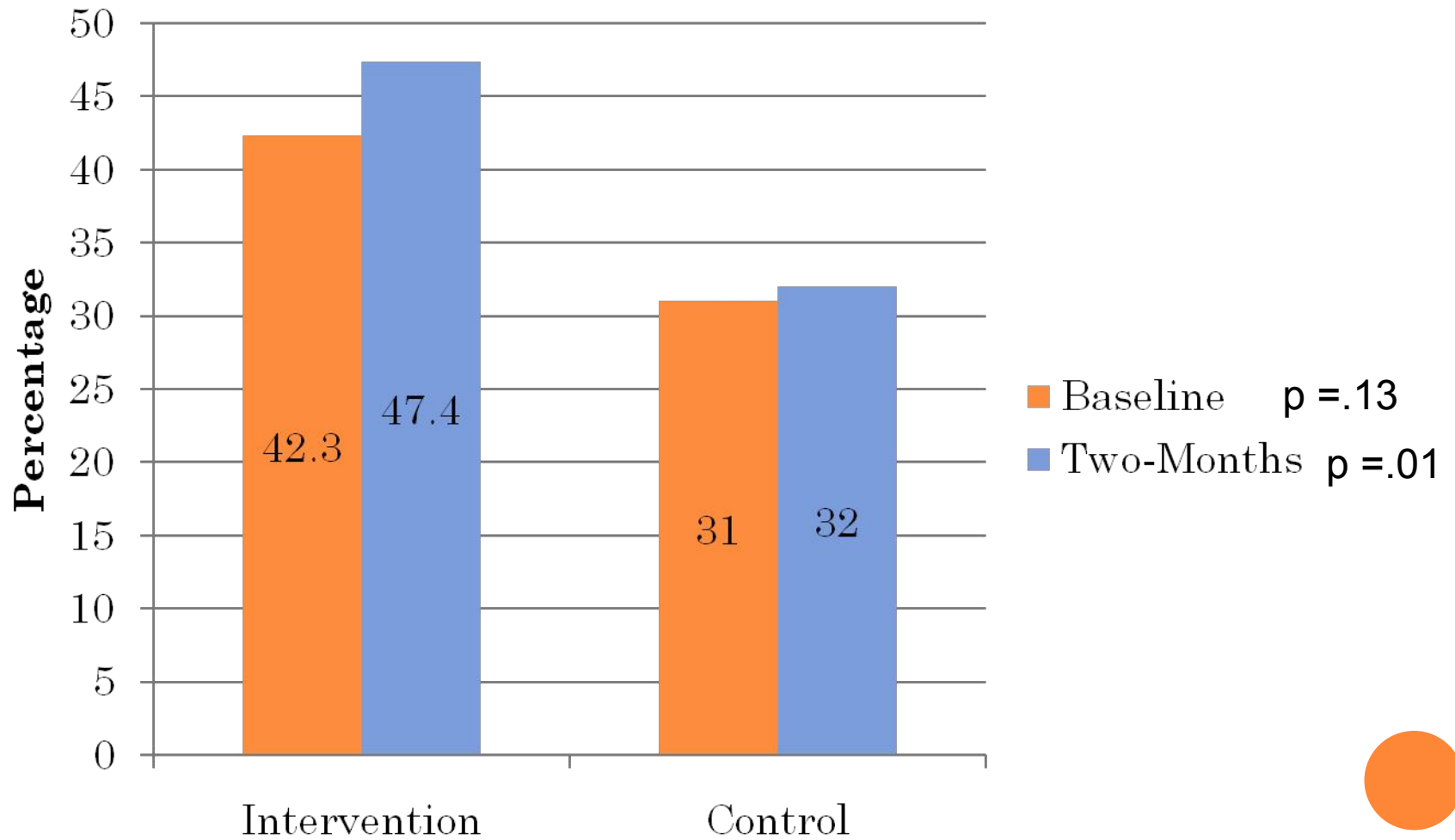
# SUNSCREEN USE



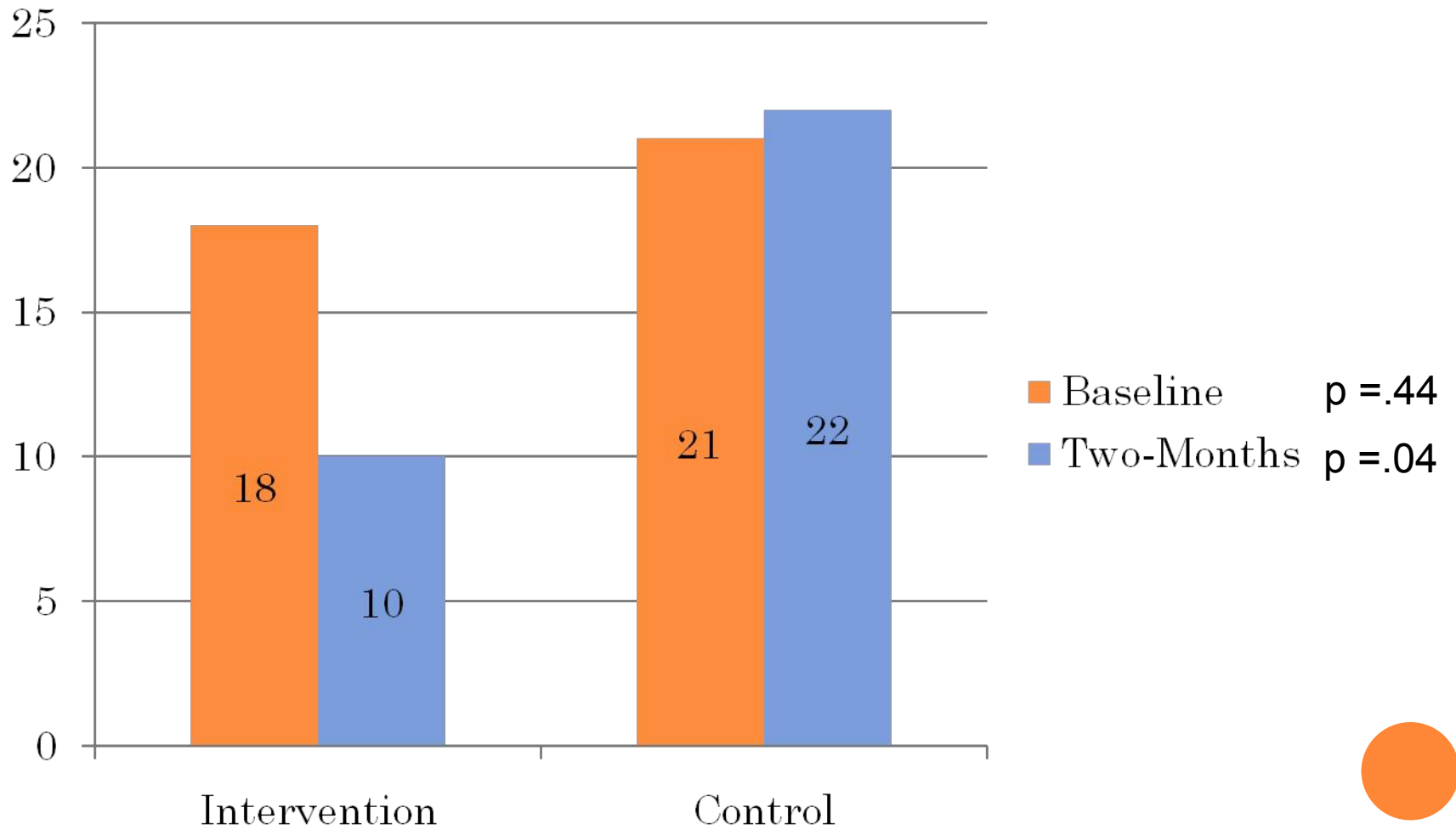
# OTHER PROTECTION (CLOTHES, SHADE, HAT, GLASSES)



# SUNLESS TANNING



# INDOOR TANNING



## MORE ON SUNLESS TANNING...

- 55% of participants in the Intervention condition reported having tried the free sample of sunless tanner.
- Those who used the sample were no different from nonusers in their sunbathing at two-months ( $p = .29$ )



# LIMITATIONS

- Randomization by individual not feasible in the beach setting
- No effect on sunscreen use
- Multi-component intervention makes it difficult to tell which components are the active ingredients and we cannot isolate the impact of sunless tanning.



# CONCLUSIONS

- A beach-based sun safety intervention that promotes sunless tanning appears to reduce sunbathing and indoor tanning and increase some forms of protection as well as use of sunless tanning
- No evidence of harm
- Sunless tanning is a desirable option for some but not all tanners, and might be a viable substitute for indoor tanners

