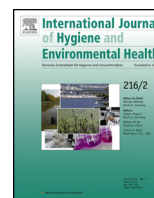




Contents lists available at ScienceDirect

# International Journal of Hygiene and Environmental Health

journal homepage: [www.elsevier.com/locate/ijheh](http://www.elsevier.com/locate/ijheh)

## Determinants of inadequate parental sun protection behaviour in their children – Results of a cross-sectional study in Germany

Swaantje Klostermann<sup>a</sup>, Gabriele Bolte<sup>a,b,\*</sup>, for the GME Study Group<sup>1</sup><sup>a</sup> Department of Occupational and Environmental Epidemiology, Bavarian Health and Food Safety Authority, Germany<sup>b</sup> Department of Social Epidemiology, Institute for Public Health and Nursing Research, University of Bremen, Germany

## ARTICLE INFO

## Article history:

Received 6 May 2013

Received in revised form 22 July 2013

Accepted 23 July 2013

## Keywords:

Skin cancer

Sunscreen

UV index

Ultraviolet radiation

Sun exposure

## ABSTRACT

**Objective:** Unprotected sun exposure especially during childhood is a risk factor for skin cancer. A combined use of sun protection measures is recommended to protect children. However, the prevalence and determinants for combined use have been scarcely studied in children. The objective of this study was to identify determinants of parental sun protection behaviour.

**Methods:** A cross-sectional survey was performed in five regions in Bavaria (Germany) during school entrance health examination (2010/2011). Parents of 4579 children (47% female, aged 5–6 years) completed a self-administered questionnaire (response 61%).

**Results:** Most children were regularly protected with single measures (shade (69%), clothes (80%), hat (83%), sunscreen (89%), sunglasses (20%). However, regarding regular and combined use, >50% of children were inadequately protected. Larger family size, lower household equivalent income, darker skin and sunburn history were associated with inadequate use of different sun protection measures. The less frequent use of one sun protection measure was associated with less frequent use of the others. Child's sex, migration background, parental education and sun exposure showed inconsistent results regarding the different sun protection outcomes.

**Conclusion:** Based on our results a regular, combined and correct use of multiple sun protection for children should be promoted independent of sociodemographic characteristics. Priority of shade, clothes and hat before sunscreen should be clarified.

© 2013 Elsevier GmbH. All rights reserved.

## Introduction

Ultraviolet radiation (UVR) is one of the major risk factors for skin cancer, a substantial and increasing health issue all over the world. History of sun exposure and sunburns are the most important behavioural risks (Balk, 2011; Berwick et al., 2009; Leiter and

Garbe, 2008; Narayanan et al., 2010; Robinson and Rademaker, 1998). Childhood sun exposure is considered as a substantial risk because child's skin has a thinner stratum corneum, lower levels of protective melanin and a higher surface area/body-mass-ratio. Thus, protection against UVR in childhood is essential (Paller et al., 2011).

To increase the awareness of UVR hazard, to reduce hazardous exposure and to lower the long-term skin cancer incidence, general population approaches are used to promote sun protection (Berwick et al., 2009). Regardless of the skin type it is recommended to seek shade particularly during the peak-intensity midday sun and to use clothes, wide-brimmed hats and sunglasses. To protect the remaining exposed skin, sunscreen (sun protection factor (SPF) 15+) should be applied (WHO, 2003). The UV index (UVI) predicts the intensity of UVR and should be used to indicate the need for protection (Balk, 2011; Berwick et al., 2009). Previous studies found that sunscreen is the most common but often inadequately used sun protection measure in adults and children (Balk, 2011; Paller et al., 2011). According to recommendations, a combination of different measures is required to be adequately protected (WHO, 2003). Up to now, the combined use of different sun protection measures has been investigated less and studies especially

\* Corresponding author at: Department of Social Epidemiology, Institute for Public Health and Nursing Research, University of Bremen, Grazer Straße 4, 28359 Bremen, Germany. Tel.: +49 421 218 68820; fax: +49 421 218 9868820.

E-mail address: [gabriele.bolte@uni-bremen.de](mailto:gabriele.bolte@uni-bremen.de) (G. Bolte).

<sup>1</sup> Health Monitoring Units (GME) Study Group of the 5th survey 2010/2011: Health Authority of the District Office of Bamberg (Angelika Pfister, Rosemarie Sittig, Winfried Strauch, Heidi Thamm, Anita Wunder); Health Authority of the District Office of Guenzburg (Tatjana Friess-Hesse, Dagmar Rudolph, Roland Schmid, Gudrun Winter); Health Authority of the City Ingolstadt (Isabella Bockmann, Christine Gampenrieder, Margot Motzet, Elisabeth Schneider, Traudl Tontsch, Gerlinde Woelk); Department of Health and Environment, City of Munich (Sylvia Kranebitter, Heidi Mayrhofer, Gertraud Rohrhirsch); Health Authority of the District Office of Schwandorf (Kornelia Baranek, Gitta Koch-Singer, Maximilian Kuehnel); Bavarian Health and Food Safety Authority, Munich and Oberschleissheim (Gabriele Bolte, Hermann Fromme, Lana Hendrowarsito, Caroline Herr, Joseph Kuhn, Bernhard Liebl, Uta Nennstiel-Ratzel, Manfred Wildner, Angelika Zirngibl).

targeting parents and children are scarce (Kasparian et al., 2009). Against this background, this study investigated the prevalence of combined, regular and correct application of different sun protection measures in children. The objective of this study was to identify determinants of parental sun protection behaviour.

## Study population and methods

### Study design and study population

A cross-sectional survey was performed during school entrance health examination (2010–2011) within the framework of the health monitoring units implemented in five regions in Bavaria, Germany (Bolte et al., 2007). In four regions (Bamberg, Ingolstadt, Günzburg, Schwandorf) a complete survey of all children was conducted. In Munich, a subsample comprising all children born between October and December 2004 was selected. Parents of 4579 children (47% female) aged 5–6 years completed a self-administered standardized questionnaire (response 61%). Parental informed consent was obtained. The first of a series of five surveys since 2004 within the health monitoring units in Bavaria was approved by the local ethics committee (Bolte et al., 2007).

### Sociodemographic and phenotypic characteristics

Sociodemographic circumstances of the child were assessed by questions about child's sex, family situation (parents' marital status, family size, single-parent family), migration background, parental education, employment status and the household equivalent income. Migration background was defined according to epidemiologic standards in Germany (Schenk et al., 2006). Parental education, employment status and household equivalent income were specified as described before (Bolte et al., 2009). Parental education was summarized into three categories (high/medium/low) that consider the highest education degree of mother or father. Employment was defined as working  $\geq 15$  h/week, marginally employment comprised  $< 15$  h/week. Child's skin type was assessed by asking about the colour of skin and eye as well as the reaction of unprotected skin to sun exposure. Hence the child was classified into one of four skin types according to Fitzpatrick (Fitzpatrick, 1988). There were only few children with skin type V or VI. These were considered in the fourth category.

### Sun exposure and sunburn

To estimate the amount of UVR exposure, questions about hours staying outside on sunny days (weekdays/weekend), number of visits to open pools, former holidays in sunny/mountainous areas or at the north-east-sea and lifetime experience of sunburn were asked. Regarding hours staying outside, the data referring to the weekend were chosen because they were assumed to reflect parent's behaviour more valid. Lifetime frequency and duration of holidays were obtained on a continuous scale. For the analysis, answers were summarized to no, 1–2 and  $> 2$  holidays. Duration was categorized into no holidays, 1–2 weeks and  $> 2$  weeks.

### Parental sun protection behaviour

Sun protection behaviour (shade, clothes, hat, sunscreen, sunglasses) used for children when outside on sunny days, was requested with given answers (never, rarely, sometimes, often, always). Sunscreen use was assessed in detail (SPF, UVA-filter, application time prior exposure, complete coverage of exposed

skin). Moreover parents were asked if they aligned sun protection to actual UVI information and if they used clothes with UPF  $> 30$ . Answers regarding sun protection were summarized to never/rarely, sometimes and often/always with the last category reflecting regular use.

### Sun protection behavioural outcomes

For the multivariate analysis single measures were combined to describe four types of inadequate sun protection behaviour. First, main messages of current sun protection campaigns were analysed to define inadequate behaviour (BfS, n.y.; StMUG, n.y.; WHO, 2003). Second, based on the recommendations of the campaigns inadequate protection was defined. The use of shade, clothes and hat as physical barriers against UV radiation and therefore the most important measures were defined inadequate if at least one of the single measures was used irregularly ( $< \text{often/always}$ ). The use of sunscreen was judged inadequate if one criterion was not fulfilled: use  $> \text{often/always}$ , SPF  $\geq 15$ , application to whole exposed skin,  $\geq 30$  min before exposure. The third outcome was the 'inadequate use of sunglasses' ( $< \text{often/always}$ ) and the fourth 'disuse of UVI'.

### Statistical analysis

Sociodemographic characteristics, prevalence of sun exposure, sun protection and sunburn were described using absolute and relative frequencies. Differences between strata were identified by Chi<sup>2</sup>-test; *p*-values were adjusted for multiple testing (Bonferroni–Holm).

Multiple logistic regression analyses were applied to identify determinants for each of the four types of inadequate sun protection behaviour separately. According to results of previous studies and bivariate associations (Chi<sup>2</sup> test  $p < 0.1$ ) possible determinants were preselected. Correlated variables (Cramer's  $V > |0.50|$ ) were excluded; afterwards all possible determinants were included simultaneously into one model to calculate the Variance Inflation Factor (VIF) to rule out potential multicollinearity. For the final models, two separate analyses were performed to firstly identify sociodemographic determinants and secondly further determinants (sun exposure, sunburn history, use of other sun protection) for each of the four types of inadequate sun protection behaviour using stepwise regression ( $p < 0.05$ ). In the first analysis all sociodemographic variables associated with at least one of the four outcomes were included into the final sociodemographic models. In the second analysis further determinants (sun exposure, sunburn history, use of other sun protection) adjusted for relevant sociodemographic factors from the first analysis were firstly examined for each outcome variable separately. Secondly, all exposure- and behaviour-related variables associated with at least one of the four outcomes were included into the final models still adjusted for sociodemographic determinants from the first analysis. Adjusted odds ratios (ORs) were estimated using reduced data sets without missing values in relevant variables ( $N = 3921$  for the first analysis and  $N = 3740$  for the second analysis).

Pairwise interactions were tested for skin type and sex. All analyses were controlled for region and skin type. Since survey period varied between study regions the variable region also reflects to some extent the season of data collection. Missing responses constitute  $< 5\%$  except for the item 'household equivalent income' (19.6%), therefore the category 'not indicated/refused' was created for the latter.

All statistical analyses were performed using the SAS software package version 9.2 (SAS Institute Inc., Cary, NC, USA).

Download English Version:

<https://daneshyari.com/en/article/2588653>

Download Persian Version:

<https://daneshyari.com/article/2588653>

[Daneshyari.com](https://daneshyari.com)