Breaking through the clouds

Impact Paragraph

Skin cancer in the Netherlands

The Netherlands is among the five countries globally showing highest skin cancer rates. The time to act is now; estimations show that in the next decennia, skin cancer rates will be two to even five times higher (11). Unprotected sun exposure and sunburn are the most important risk factors for skin cancer, making it a highly preventable disease. Sun safety – being safe in the sun – for children is particularly important since sunburns during childhood profoundly increase skin cancer risk. As insight in children's sunburn, sun exposure and sun protection is very limited, our efforts to unravel children's sun safety in the Netherlands are imperative and timely.

Understanding children's sunburn, sun exposure and sun protection

As parents bear the main responsibility for their children's sun protection and are the most important caregivers and educators, we aimed to unravel children's sun safety from a parental perspective. The purposes of our research were threefold: 1) increasing knowledge about sun exposure and sunburn among children (aged 4 to 12 years old); 2) gaining insight in parents' and children's own sun protection behaviours, and; 3) understanding parental sun protection behaviours from an individual and environmental perspective. In brief, our most interesting findings indicated that;

1) More than 4 in every 10 children experienced one or more sunburns every year, with older children showing higher sunburn risk than the younger. Parent's reports indicated that children were often exposed to the sun's damaging UV-radiation in both high-risk situations (such as going to the beach or swimming pool) and while engaging in everyday activities (such as cycling or playing outside). Parents seemed less aware of sun exposure risks in these latter situations. Further, limiting sun exposure in high-risk situations seemed to decrease children's risk of sunburn.

2) Parents engaged in sun protection behaviours frequently and applied sunscreen most often, followed by putting on clothing and seeking shade. Parents also frequently supported their children in performing their own sun protection behaviours. Sun protection was more often performed in earlier mentioned high-risk, than in everyday situations. Among children themselves, older children and girls performed sun protection strategies most frequently.

3) From an individual-based perspective: a) parents' attitudes about sun protection behaviours, confidence about performing sun protection and preparing for sun exposure by making plans (e.g. making sure a bag with sunscreen is always readily available) were most important in predicting their behaviours; and b) parents held a positive attitude towards a tanned skin - indicating that they believed it looks more beautiful and healthy on their child, which may interfere with their sun protection behaviours. From an environmental perspective, we found that: a) many aspects of the physical environment either hinder (e.g. water-related activities burdening efficient sunscreen application) or promote (e.g. facilitating sunscreen or shade) parental sun protection behaviours; and b) some environmental 'cues' encouraging sun protection, such as provision of hats or shaded areas at schools or at playgrounds, are effective in enhancing children's sun safety.

The relevance of our findings

As high sunburn rates were found despite parents' fair reported sun protection behaviours, we conclude that sun safety among children in the Netherlands is in need for improvement. We recommend that besides targeting on groups (i.e. older children and boys), and developing tailored educational content (e.g. on attitudes, self-efficacy and action planning), the physical environment should deserve a role in future interventions.

We expect our results to have a potential impact on 1) development of public health interventions focused on children and parents, 2) the current and future scientific field of primary skin cancer prevention, and 3) the development of a national skin cancer prevention strategy in the Netherlands.

1. Practical relevance

We indicate that sun safety interventions for children and parents are warranted. Program planners can take into account the many concepts we identified related to children's sun safety when planning health education and health promotion programs. We provided recommendations for: a) educational content; and b) alterations in the physical environment.

Firstly, parents need education to increase their awareness about sunburn, sun exposure risk and effective sun protection strategies and guidance in how to perform them adequately. Furthermore, in preparation for the shift in behavioural responsibility, parental role modelling and support and children's mastery of own sun protection behaviours need focus in future interventions.

Secondly, characteristics in the environment, such as establishing shaded areas or providing sunscreen or sun protective clothing, are worthy of consideration for future interventions. Besides intervening in the family setting, our practical recommendations can also be applied to other settings where children are sun-exposed, such as at school, sports clubs or outdoor recreation. Health promotion professionals and policy makers at Municipal Public Health Services, communities, primary schools, after-school care, in urban design, and sports clubs can benefit from our results by taking the above recommendations into account when designing and implementing (multi-component) interventions.

2. Scientific relevance

We contributed to a scientific field that was so far limited in the Netherlands. We aimed to make our scientific output widely available, by posting our findings on the Open Science Framework (OSF) and submitting our work in Open Access Journals. Besides scientific publications, our main findings were also presented at both national (public health and health psychology focused) and international (skin cancer prevention focused) conferences. Furthermore, we organized a symposium consisting of international researchers involved in (primary) skin cancer prevention from the Netherlands, Australia, the United States and Denmark that will take place in the Autumn of 2021.

Scientists can benefit from our research when developing evidence-based sun safety interventions for parents and children and when ultimately systematically evaluating these interventions. While the composition of evidence-based skin cancer prevention programs is highly warranted, they are evidently lacking in the Netherlands up until now. It should be strived for that skin cancer prevention interventions are composed and officially recognised by the Centre for Healthy Living, thereby reaching broader audiences and enabling systematic evaluation. Further, since we identified gaps in the current scientific literature, we provided recommendations for further research, namely: a) objectively assessing children's sunburn and sun exposure; and b) investigating parental and children's sun protection behaviours in manipulated settings.

Firstly, our studies provided indications of children's sunburn and sun exposure, but objective information is currently missing. Objectively monitoring children's sunburn incidence and sun exposure patterns is likely to reveal more in-depth information regarding at-risk groups and at-risk situations or settings. This information will further optimize the content and targeting of interventions.

Secondly, we indicated that adaptations in the physical environment can encourage sun safety strategies. Since the effects of environmental cues on sun protection behaviours were not tested in a Dutch setting, our findings suggest developing, testing and, when proven effective, disseminating and testing such interventions (e.g. provision of shade and free sunscreen) in the Netherlands. This can provide information on sun protection preferences and shortcomings, which enables us to provide specific directions for interventions. Thus, studies comparing different types of environments, observing behavioural patterns and investigating the effects of implemented cues could be worthwhile. These future studies enable interventions to tailor on high-risk settings or at-risk groups, thereby potentially enhancing effectiveness of these interventions.

3. Societal relevance

Formulating a skin cancer prevention strategy that is adhering to societal needs, norms and considers the current political climate, is warranted. As the Netherlands faces many other public health challenges, the findings in this thesis can function as an entry point to put primary skin cancer prevention (more) on the political agenda. Our scientific efforts have potential impact on and contribute to shaping a sun safety policy framework in the Netherlands.

Support for sun safety policy

Our findings present an important signal towards the Dutch government and politics to start with efforts towards policy change. Public acceptance or support for policy measures can positively influence the effectiveness of policy and plays an important role in the policy-making process. With this in mind, we explored support for sun safety policy in several small-scaled exploratory studies, not reported on in this thesis (unpublished data) among: 1) parents; 2) teachers and directors of primary schools; and 3) operators of recreational venues and policy makers. In short, parents seemed supportive of the (further) implementation of sun safety policy, and were especially positive about sunbed-related and school-related policies. Furthermore, while only a minority of teachers and school directors indicated that a sun safety policy was in place at their schools, they were supportive of integrating sun safety in their schools.

These preliminary findings indicate opportunities to implement sun safety policy at primary schools in the Netherlands. For example, educational programs addressing both children and their parents and a shade policy for school playgrounds should be developed and maintained. The Healthy School concept, aimed at promoting children's health at several levels of education, should ideally integrate UV-exposure as one of the health themes in their approach.

Lastly, when interviewing operators of recreational venues and policy officers at local and regional health authorities, both groups expressed moderate to high interest in skin cancer prevention efforts and recognized the need for the development and implementation of sun safety policies. These findings, based on interviews and surveys, albeit preliminary, demonstrate a 'window of opportunity' for sun safety policy among relevant target groups, thereby encouraging the creation of policy on a (Dutch) societal level.

An integrative approach to climate-related health issues

Time is all we have and don't have; the right time for addressing skin cancer in the Netherlands is now. Fortunately, initiatives are currently unfolded, recognizing the need for skin cancer prevention. National policy goals addressing climatological issues and heat stress were presented in the 'Nationale Klimaatadaptatiestrategie' (NAS) in 2018 (458). The aims described in this strategy were further translated in a research agenda from the Dutch fund for health research (ZonMw) (459). The excessively increased

skin cancer incidence rates in the Netherlands were mentioned in this agenda, together with the call for efforts to reduce UVR-exposure on a societal level. In this ZonMw report, altering physical environments and thereby facilitating sun protection behaviours was acknowledged as an important strategy. We interpret this as a further opening up of the window of opportunity for the promotion of sun safety initiatives and advocate for the integration of strategies to tackle climate-related health problems - such as heat stress - and put a stop to the increasing incidence of skin cancer in the Netherlands.

A national 'call to action'

Another national initiative that was recently established is the so-called 'Zonkracht Actieplan' (ZAP)(460), appointed by the Dutch Ministry of Health, Welfare and Sports. This collaboration platform serves as a 'call to action' to increase skin cancer awareness among the Dutch general public. This initiative unites all Dutch parties involved in skin cancer prevention, including both governmental and non-governmental foundations, universities and medical centres. The department of Health Promotion of Maastricht University has been actively involved in this task force since its establishment in 2017. Together with other experts from various fields, we share (scientific) knowledge, develop communication and strategy plans, formulate national sun safety recommendations, and specify research agendas for the upcoming years. Parts of the research presented in this thesis has already found its way and will continue to find its way into recommendation guidelines and strategic plans. Continued involvement in and contribution to the ZAP in the future will further ensure the translation of our scientific observations regarding primary skin cancer prevention into practical value.

'Better by far to be good and courageous and bold and to make difference. Not change the world exactly, but the bit around you.'

—— David Nicholls, One Day