

ORIGINAL ARTICLE

CHILDREN SLEEPING OUTDOORS IN WINTER: PARENTS' EXPERIENCES OF A CULTURALLY BOUND CHILDCARE PRACTICE

Marjo Tourula, Arja Isola, Juhani Hassi

Institute of Health Sciences, University of Oulu, Oulu, Finland

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ABSTRACT

Objectives. The purpose of this study was to describe parents' opinions about their children sleeping outdoors during the Finnish winter and the prevalence of this practice in the city of Oulu.

Study Design. A cross-sectional study using a questionnaire.

Methods. Data were collected using a questionnaire compiled for the purpose of giving us a window into this childcare practice in northern Finland. The questionnaire was distributed to the parents of children under 2 years of age using the services of child welfare clinics in Oulu (n=116). The study was mainly quantitative and partly qualitative.

Results. Allowing children to sleep outdoors in the winter was considered a common practice and was taken for granted. It usually began when the child was 2 weeks old, and was carried out once a day. Children took longer naps outdoors compared with naps taken indoors. Outdoor temperatures ranged between -27 and +5°C. Parents' experiences were mainly positive and most parents had not faced potentially dangerous situations. However, parents reported that the children's fingers felt cold in 3% of the children sleeping in 0°C temperatures and in 25% sleeping in -15°C temperatures. Almost half of the children had sweaty necks at 0°C, but the most frequent symptoms were red cheeks and cold nose tips.

Conclusions. In addition to this cross-sectional study and the parents' subjective and mainly positive experiences, objective measurements and an extensive study about parents' experiences are needed before guidelines for allowing children to sleep outdoors in the winter can be updated. (*Int J Circumpolar Health* 2008; 67(2-3):269-278)

Keywords: cold climate, child welfare, health, infant

INTRODUCTION

Arvo Ylppö, a well-known Finnish paediatrician, started to distribute childcare guidelines to the mothers of infants in the 1920s. Infant mortality was high in Finland and the aim was to reduce mortality by giving mothers guidelines that might improve the care of their children (1). Guidelines for infants sleeping outdoors were premised on poor air quality inside the home, preventing rickets and creating sound blood. Fresh air and sunlight were considered important preventive factors against diseases. Cold air was thought to increase blood circulation in the linings of the nose and mouth and thus increase immunity against bacteria. Infants' faces could be exposed to wind, fresh air and sunlight with no harm if they were out regularly in cold air at an early stage (2). Newborn infants were regarded as being too sensitive to the cold, but by the time they were a few weeks old, they were allowed to be taken out into temperatures of -10°C to -15°C without any worries (3). Infants sleeping outdoors in the winter is a common phenomenon in Finland nowadays as well.

The geographical position of Finland is between the 60th and 70th northern parallels on the Eurasian continent's coast. Finland belongs to the temperate coniferous-mixed forest zone and experiences cold and wet winters, during which weather can change rapidly. In Finland, the mean winter temperature remains below 0°C and thus constitutes the longest season, 100 to 200 days. (5). A cold environment includes all the environmental conditions that activate body temperature regulation to help diminish heat loss and stimulate heat production (6,7).

Exposure to cold temperatures can cause cold-related complaints, symptoms and injuries (8). The type and intensity of cold exposure as well as many individual factors such as age, gender, the layer of insulating fat, previous adaptation and medication interact with cold-related symptoms (9). An infant's high surface area to volume ratio, thin layer of insulating fat and poorly developed shivering mechanisms can cause a greater risk of hypothermia (10). The heat production of the newborn infant is based on non-shivering thermogenesis from chemical reactions of adenosine triphosphate hydrolysis in brown adipose tissue (11). The importance of brown adipose tissue diminishes by the age of 2 (12).

Traditional life-styles and an individual's well-being are influenced by the environment (13). More research and information are needed and attention should be focused on life-styles today in order to gain a better understanding of the health effects of environmental exposures (14,15) and the sensitivities of infants and children to environmental hazards to give parents better possibilities of protecting their children's health (15). The purpose of this study was to examine children who sleep outdoors during the Finnish winter and the prevalence of this practice in northern Finland. Why do parents put their children out to sleep in cold weather and what are their opinions about the beneficial and adverse effects of infants sleeping outdoors in the winter? The inductive and directional hypothesis (16) was that children take longer naps outdoors in the winter compared with naps they take indoors, which was based on general observation and observed relationships.

MATERIAL AND METHODS

The approach of the study was mainly quantitative and partly qualitative. Empirical data were collected using a pre-tested questionnaire compiled for the purpose. The questionnaire was developed by interviewing 4 parents who were allowed to speak openly about their children sleeping outdoors. We also used theoretical background information (1–3,6,10,17–21) and questionnaires (22,23) from other studies designed for adults and adolescents to obtain information about how cold weather affected them. The questionnaire consisted of 3 sections: the background information of the family consisted of 7 questions (Table I); the practice of allowing children to sleep outdoors during the winter (for example, the nature and frequency of sleeping outdoors, how the practice was organized) consisted of 23 questions; and the parents' opinions and grounds for letting their children sleep outdoors in the winter consisted of 21 statements (Table II). Nominal, Interval and Likert Scales as well as open questions were used. A pilot study was conducted by students (n=15) from the Department of Nursing Science and Health Administration at the University of Oulu. A specialist on the cold was also heard from.

The questionnaires were distributed systematically to the parents (n=260) of children under 2 years of age using the services of public health nurses in the child welfare clinics in Oulu. Background information of the families is shown in Table I. Responding was voluntary and informed consent from parents was obtained. The privacy of participants was maintained

through anonymity. The material analysed consisted of 116 questionnaires (45%). In a questionnaire study, non-responder bias can affect the results (24), which is why a non-responder (n=10) analysis was conducted.

A limitation of the present study is its small sample size and low response rate (45%). Non-response analyses were made and responders and non-responders were nearly equal. These aspects lent support to external validity and generalization. Internal validity was based on interviews with parents and a pilot study in which students, most of whom had children, took part as well as hearing a cold research specialist. The answers to the open questions were similar to quantitative questions, which showed that the subject was broadly measured by the questionnaire. Reliability was assessed by using a pilot test and calculating Cronbach's alpha for some parts of the questionnaire, which were 0.6–0.81.

Quantitative material was statistically analysed using SPSS 12.0 for Windows and MS Excel. Cross-tabulation and the χ^2 test were used in statistical analysis, when follow-up density and using a baby monitor to listen for the baby were compared; this was then followed by comparing children who slept longer outdoors and those children who slept longer indoors with the number of siblings and the types of housing they lived in. The hypothesis was tested using the one-sample T test. Data from those who responded to the questionnaire and those who did not were compared in a non-response analysis, which was carried out using cross-tabulation, the χ^2 test and the Mann-Whitney test. Material from the open questions was content analysed.

Table I. Background information about the families.

Background variables	n	%	n	%
Age	Mother		Father	
20–29	67	58	54	47
30–39	46	40	50	44
40–60	3	2	10	9
Education				
No occupational education	13	11	6	5
Occupational courses	1	1	6	5
Vocational education	25	22	37	34
Polytechnic school	43	37	25	23
University	34	29	36	33
Housing			Family	
Semi-detached or terrace house			47	41
Block			51	44
One-family house			17	15
Country where family had lived				
Only in Finland			99	86
In the Nordic countries			3	3
In other part of Europe			3	3
Outside Europe			8	7
In many countries			2	1
Number of children				
1			58	50
2			34	29
3			15	13
4–8			9	8

Table II. Structure of the questionnaire.

Sections of the questionnaire	Subjects of variables
A. Background information	
B. Practices of children sleeping outdoors	Regularity, child's age, weather, temperature, sleeping outdoors when child is sick, child's symptoms related to too warm or too cold temperatures, clothes, place for outdoor sleeping, observation of the sleeping child, received guidelines
C. Opinions and grounds for sleeping outdoors	Positive effects, negative effects

RESULTS

Letting children sleep outdoors in the winter as a culturally bound childcare practice

The guidelines dealing with children sleeping outdoors had been given to the parents from different sources. Grandparents were the biggest group (39%), and they gave lots of advice. A great number of guidelines were received from friends (33%) and public health nurses (28%). Almost all parents estimated that they had received enough advice and that the guidelines were consistent: there was consensus on the content of the guidelines about letting children sleep outdoors. Only 3% of parents had received advice not to let their children sleep outside in the winter.

A child sleeping outdoors in the winter was common (95%) in the city of Oulu, and the custom was taken for granted (83%). The child was taken outdoors and was left to sleep in the pram while the rest of the family spent time indoors. The child also slept outdoors in the pram while the rest of the family did their outdoor activities. Sleeping outdoors usually commenced when the child was 2 weeks old, but could begin as early as 3 days to 7 months. It was usually stopped when the child was 1 (29%) or 2 years old (29%), but also ranged between 4 months and 3 years. The child was usually (52%) taken out once a day, the frequency ranging between 3 times a month and twice a day. Most of the parents (81%) felt that it was not inconvenient to take the child outdoors to sleep.

An illness such as a fever (97%) or otitis (85%) was an obstacle to taking the child outdoors. Almost a third of the parents took their child out to sleep when the child had the

sniffles (36%) or a cough (38%). Those families who did not take their child outside to sleep evaluated that there was no use for that practice. Smoking on the next balcony also prevented some parents from taking their child outdoors.

The sleeping child was frequently observed by her/his parent. In the group who did not use a baby monitor, the parent usually went outside to observe the sleeping child every 15 minutes (57%), and in the group using a baby monitor, the parent checked every half an hour (40%). The connection between follow-up density (15 minutes, 30 minutes, 1 hour or less frequently) and using a baby monitor was clear ($p=0.004$). Parents noted the child's breathing, babble, moving about and the amount and quality of sleep. The child's temperature was also evaluated by touching the child's skin or using a thermometer inside the pram. The risk of cheek frostbite was taken into account. Parents made sure that clothing such as gloves and hat stayed securely in place and that the child was wearing appropriate clothing.

The children were clad in layered clothing. Underclothes were the same in different outdoor temperatures, but the use of woollens and outerwear differed in temperatures of 0, -10 and -15°C. Clothing insulation was higher in colder conditions.

Environmental conditions

The best temperature for letting a child sleep outdoors was evaluated to be about -6°C. Many parents (34%) answered that the coldest temperature they had taken their child out was -15°C, but the temperature varied quite a lot (Fig. 1). One-third of the parents (29%) agreed with the statement that it is good for

the child to toughen up by sleeping outdoors so that he/she can withstand the cold Finnish climate. Many parents (43%) could not express an opinion about this statement.

Wind, the course of the wind, rain, sunshine, changes in weather and the climate as a whole were observed by the parents. The peacefulness of the immediate surroundings also comprised the safety of the outdoor environment: the parents monitored the level of noise, movements of passers-by and the activities of cats, birds and squirrels.

Subjective reports of the parents about beneficial and adverse effects of letting children sleep outdoors

Almost all parents (95%) thought that there were no disadvantages to letting their child sleep outdoors in the winter. The parents evaluated their child as being more active (66%) after naps taken outdoors compared with naps taken indoors and that the child (88%) clearly enjoyed sleeping outdoors. More than half of

the parents (54%) observed that their child ate better after sleeping outdoors. Most parents (94%) felt that sleeping outdoors was healthy because of the fresh air. However, 65% of the parents were not able to say whether their child might stay healthier because of sleeping outdoors.

A new variable was made by subtracting the duration of sleeping outdoors from the duration of sleeping indoors. The hypothesis was tested using this variable and the one-sample T test when the location was 0. The mean value was 0, 57 and 95% CI 0, 35-0, 79. Children took longer naps outdoors compared with naps taken indoors ($p < 0.001$). Half of children slept 1, 5-3 hours outdoor and 1 to 2 hours indoors (Fig. 2). Most of the children (57%) in the group that slept longer outdoors had siblings, while most of the children (74%) in the group that slept longer indoors were the family's only child ($p = 0.05$). Children took longer naps outdoors compared with naps taken indoors in all types of housing ($p = 0.004$).

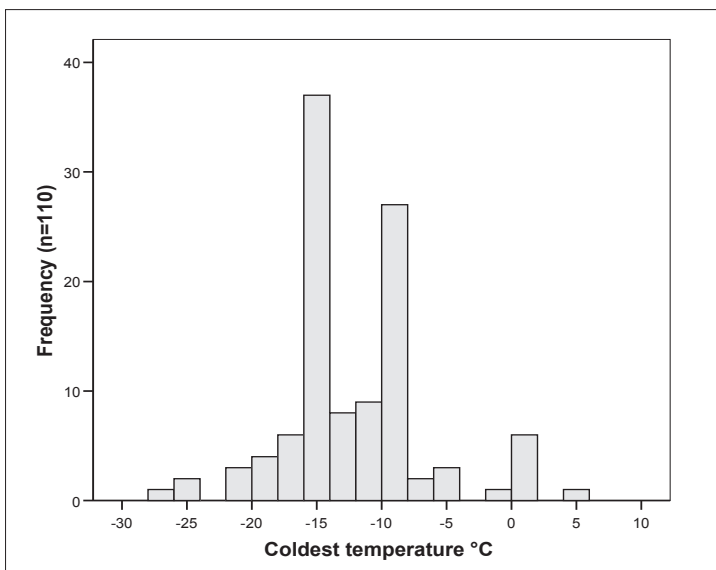


Figure 1. The coldest temperatures in which parents let their children sleep outside.

Most of the parents (88%) had not encountered potentially dangerous situations when letting their child sleep outdoors. Those who did experience dangerous situations described them as when cats, birds or squirrels had moved too close to the pram. Or when gloves had come off some of the children, or when the baby monitor connection had been broken off while the child was sleeping. Some parents were concerned

about problems with the child's breathing.

According to the subjective reports of the parents (Fig. 3), they found that the 3% of children had cold fingers in 0°C temperatures and that 25% had cold fingers at -15°C. Cold toes were noted less frequently. A white area on the cheek was uncommon, but red cheeks and cold nose tips were very common. Almost half of the children had sweaty necks at 0°C, with decreasing prevalence in colder temperatures.

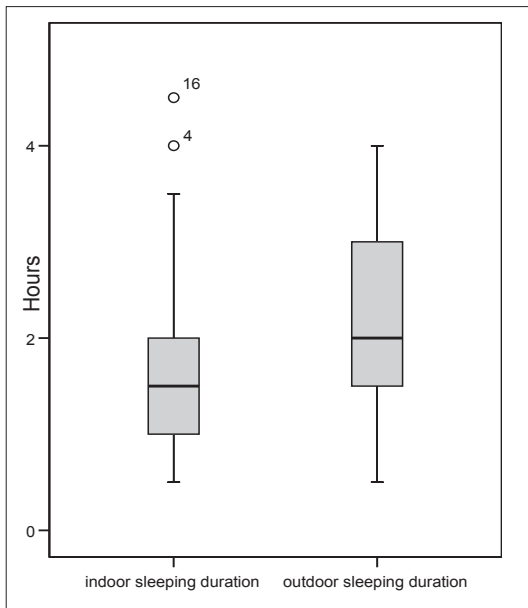


Figure 2. Sleeping durations indoors and outdoors. Box plots show median, first and third quartiles, minimum and maximum values (whiskers). Outliers are marked as data points and circles.

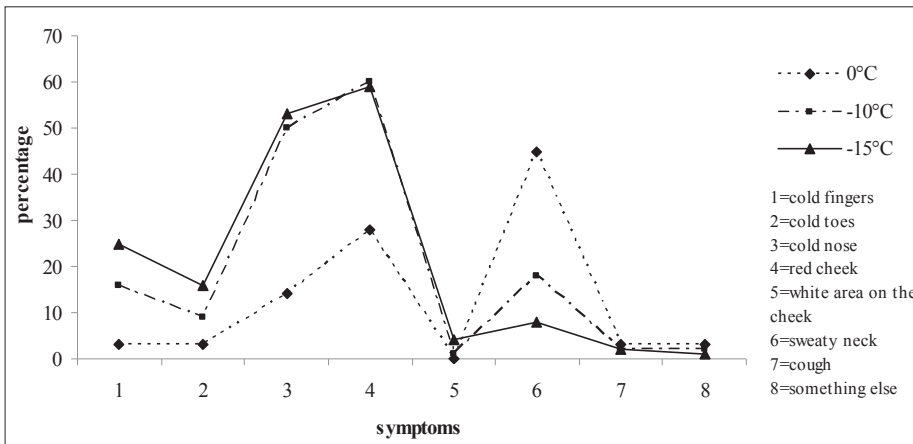


Figure 3. Parents' subjective reports about their children's symptoms after sleeping outdoors.

DISCUSSION

This study provides a window on a culturally bound childcare practice in northern Finland. Culture can be viewed as a broad and comprehensive way of knowing, explaining and predicting people's ways of life over time and in different geographic locations (25). At the beginning of the twentieth century, it was not so common to see infants sleeping outdoors during the winter. Public health nurses first had to demonstrate the importance of outdoor sleeping on a child's health in the 1940s and 1950s. Counselling evolved from emphasis of importance to practical instructions and advice about duration and clothing in the 1960s (26). The results of this study illustrate that children sleeping outdoors during Finnish winters is nowadays generally in accord with earlier guidelines given by paediatricians such as Arvo Ylppö in the 1940s. Sleeping outdoors has always been considered a practice that promotes children's health, although the aims have changed from preventing diseases such as rickets to the comprehensive well-being of children and families.

According to this study, a child sleeping outdoors in the winter was a common occurrence and was taken for granted. Usually the child was taken out once a day when the outdoor temperature was above -15°C , and the child slept longer outdoors than indoors. Parents' experiences were mainly positive and most parents had not faced potentially dangerous situations. This kind of childcare practice does not exist among the Inupiat in Alaska, where babies are kept outdoors and are commonly carried on the mother's back inside her parka (4). Childcare customs may

not have explicitly recognized meanings for the caretakers. They can be so commonly used by members of the community that they do not need individual rationalization and are not necessarily given conscious thought. (28.)

Besides all its opportunities, the cold environment in northern Finland and exposure to its cold temperatures did cause various cold-related complaints, symptoms and injuries (8). Nonetheless, most parents estimated that they dealt with their child's outdoor activity very well (20), and confirmed that they added layers to the child's clothing in colder conditions. However, the parents did report children having sweaty necks at 0°C , which might be a sign of overheating that is often connected to too much heavy clothing. Otherwise, cold fingers and toes at -15°C might indicate that children were cold and their clothing too light for the weather.

In the fetus and neonate, sleep is categorized into active and quiet sleep (27), and homeothermic processes in neonates are maintained and well-protected during these stages. Thermal responses are sometimes greater during the active sleep than those recorded during quiet sleep. (17.) The cool temperature increases body activity and tends to decrease total sleep time and especially total duration of quiet sleep (18,19). The duration of wakefulness after sleep increases with exposure to the cold (19,21). The result of this study does not replicate previous studies. Children took longer naps outdoors compared with naps taken indoors and they were livelier after naps taken outdoors. Presumably children were not exposed to very cold conditions because of the microclimate inside the prams. Heat

exchange is reduced according to a factor calculated by the effect of the clothing's insulation, and heat exchange depends on the temperature difference between the body and the microclimate established inside the pram or clothing (17). Clothing insulation was higher in colder conditions. Physiologic recordings were used in earlier studies dealing with cool exposure in sleeping neonates (17–19,21). In this study data were collected using a questionnaire designed to find out parents' opinions about children sleeping outdoors and results were based on their responses. Due to these different methods, results cannot be compared directly. Sleeping durations and cold-related symptoms were evaluated by the parents and further study will be conducted in order to measure infants' skin temperatures while they sleep outdoors in the winter.

In conclusion, subjective and objective information as well as further research are needed before a child sleeping outdoors in the winter can be evaluated more exactly and guidelines can be updated and more fully developed.

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Marjo Tourula, MNSc, Doctoral student
Finnish Post - Graduate School in Nursing Science
Institute of Health Sciences
P.O. Box 5000
FI-90014 University of Oulu
FINLAND
Email: marjo.tourula@oulu.fi