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SANNA SIPONEN

*Children's Health, Self-Care
and the Use of Self-Medication*
A Population-Based Study in Finland

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SANNA SIPONEN

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ABSTRACT

In this thesis, children's health, self-care process, the use of self-medication and factors associated with health, self-care and self-medication are described in the literature review. The empirical part of this thesis evaluates the health, the use of self-medication (including over-the-counter (OTC) medicines and complementary and alternative medicines (CAMs)) and factors associated with health and self-medication among Finnish children.

This study is based on a cross-sectional questionnaire survey for parents of children under 12 years of age that was carried out in spring 2007. The study population consisted of a random sample of Finnish children (n=6,000) aged under 12 years. A questionnaire was sent primarily to mothers, and a response rate of 67% (n=4,032) was gained.

The majority of children (97%) had good health status reported by their parent. One tenth of children had some long-term disease, mainly allergy or asthma, and over half (66%) of children had experienced some symptom(s) currently. Symptoms of common cold and eczema were the most common symptoms children had experienced. The prevalence of psychosomatic symptoms was 11%; sleep disorders and fatigue or dizziness were the most common among these.

Half of the children had used some self-medication (including OTC medicines, vitamins and CAMs). One fifth (17%) of the children had used OTC medicines, and one tenth (11%) had used CAMs. Analgesics and antipyretics, mainly paracetamol, were the most common OTC medicines used among children, and fish oils and fatty acids, followed by probiotics, the most common CAMs.

Parental socioeconomic background was not associated with health or the use of OTC medicines or CAMs, whereas parental attitudes toward medicines were especially associated with the use of CAMs. CAMs use was less likely among children whose parents had positive views toward prescription medicines. In addition, parental positive attitude toward OTC medicines, and on the other hand, worries about the risks of medicines predicted the use of CAMs among children.

The health of Finnish children was mainly good, even though the experience of symptoms and the use of self-medication were quite common among them. Parental socioeconomic background was not associated with health or the use of self-medication among children. Instead, parental attitudes, such as worries about the risks of medicines were found to be associated with the use of self-medication among children, predicting especially the use of CAMs among them. Health care professionals should ensure the safe use of self-medication among children administered by their parents, also taking into account parents' views on the use of medicines.

National Library of Medicine Classification: QV 55, QV 57, WB 120, WB 141.4, WB 327, WB 890

Medical Subject Headings: Health; Health Status; Self Care; Self Medication; Pharmaceutical Preparations; Nonprescription Drugs; Complementary Therapies; Chronic Disease; Signs and Symptoms; Psychophysiologic Disorders; Parents; Socioeconomic Factors; Attitude; Cross-Sectional Studies; Child; Finland

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Suomalaisten lasten terveys, itsehoito ja itselääkitys

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TIIVISTELMÄ

Tämän tutkimuksen kirjallisuuskatsauksessa käsitellään lasten terveydentilaa, itsehoidon prosessia lapsilla, itselääkityksen käyttöä sekä näihin yhteydessä olevia tekijöitä. Tutkimuksen tavoitteena on selvittää suomalaisten lasten terveydentilaa, lasten itselääkityksen, itsehoitolääkkeiden ja täydentävien ja vaihtoehtoisten valmisteiden käytön yleisyyttä sekä mitkä tekijät ovat yhteydessä suomalaisten lasten terveyteen ja itselääkitykseen.

Kyselytutkimus toteutettiin keväällä 2007. Tutkimusjoukko muodostui 6000 suomalaisesta alle 12-vuotiaasta lapsesta, jotka poimittiin satunnaisotannalla väestörekisterikeskuksen tietokannasta. Tutkimus tehtiin postikyselynä, joka lähetettiin lapsen vanhemmalle, ensisijaisesti lapsen äidille. Vastausprosentti oli 67 % (n = 4032).

Suurin osa vanhemmista (97 %) arvioi lapsensa terveydentilan olevan hyvä. Noin yhdellä kymmenestä lapsesta oli jokin pitkäaikais sairaus ja yli puolella (66 %) oli vähintään yksi oire tutkimukseen vastaamishetkellä. Flunssan oireet ja ihottuma olivat näistä yleisimmät. Psykosomaattisia oireita, yleisimmin unihäiriöitä sekä väsymystä tai heikotusta, oli kokenut 11 % lapsista.

Puolet lapsista oli käyttänyt jotain itselääkitystä (itsehoitolääkkeitä, vitamiineja ja/tai täydentäviä ja vaihtoehtoisia valmisteita). Viidesosa (17 %) lapsista oli käyttänyt jotain itsehoitolääkettä ja kymmenesosa (11 %) jotain täydentävää ja vaihtoehtoista valmistetta. Kipu- ja kuumelääkkeet, yleisimmin parasetamoli, olivat yleisin lasten käyttämä itsehoitolääkeryhmä. Kalaöljy ja rasvahapot sekä probiootit olivat lasten yleisimmin käyttämät täydentävät ja vaihtoehtoiset valmisteet.

Vanhemman sosioekonomisella asemalla, kuten koulutuksella ja tuloilla, ei ollut yhteyttä lasten terveyteen tai itselääkityksen käyttöön, kun taas vanhemman asenteella lääkkeiden käyttöä kohtaan oli yhteyttä etenkin täydentävien ja vaihtoehtoisten valmisteiden käyttöön. Lapset, joiden vanhemmat suhtautuivat positiivisesti reseptilääkkeiden käyttöön, käyttivät harvemmin täydentäviä ja vaihtoehtoisia valmisteita kuin ne lapset, joiden vanhemmat suhtautuivat niiden käyttöön negatiivisesti. Vanhemman positiivinen suhtautuminen itsehoitolääkkeiden käyttöön ja toisaalta myös pelot lääkkeiden käyttöä kohtaan olivat sen sijaan myötävaikuttavia tekijöitä lapsen täydentävien ja vaihtoehtoisten valmisteiden käytölle.

Tämän tutkimuksen mukaan suomalaisten lasten terveydentila on hyvä, vaikka oireiden esiintyminen ja itselääkityksen käyttö on yleistä. Vanhemman sosioekonominen asema ei ollut yhteydessä lasten terveyteen tai itselääkityksen käyttöön. Vanhempien asenteilla, kuten peloilla lääkkeiden käyttöä kohtaan, oli sen sijaan merkitystä lasten itselääkityksen, erityisesti vaihtoehtoisten ja täydentävien valmisteiden käyttöön. Terveystieteiden ammattilaisten tulisi varmistaa, että vanhempien lapsille antama itselääkitys toteutetaan kotona turvallisesti. Vanhempien näkemykset lääkkeiden käyttöä kohtaan tulee myös huomioida lääkeneuvonnassa.

Luokitus: QV 55, QV 57, WB 120, WB 141.4, WB 327, WB 890

Yleinen suomalainen asiasanasto: terveys; terveydentila; itsehoito; lääkkeet; käsikauppalääkkeet; vaihtoehtolääkintä; krooniset taudit; oireet; vanhemmat; sosioekonominen asema; asenteet; lapset; Suomi

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In Kuopio, March 2014

A handwritten signature in black ink, appearing to read 'Sanna Siponen', with a long horizontal stroke extending to the right.

Sanna Siponen

List of the original publications

This dissertation is based on the following original publications:

- I Siponen SM, Ahonen RS, Savolainen PH, Hämeen-Anttila KP. Children's health and parental socioeconomic factors: a population-based survey in Finland. *BMC Public Health* 11:457, 2011.
- II Ylinen S, Hämeen-Anttila K, Sepponen K, Lindblad ÅK, Ahonen R. The use of prescription medicines and self-medication among children – a population-based study in Finland. *Pharmacoepidemiology and Drug Safety* 19:1000–1008, 2010.
- III Siponen SM, Ahonen RS, Kettis Å, Hämeen-Anttila KP. Complementary or alternative? Patterns of complementary and alternative medicine (CAM) use among Finnish children. *European Journal of Clinical Pharmacology* 68:1639–1645, 2012.
- IV Siponen S, Ahonen R, Kiviniemi V, Hämeen-Anttila K. Association between parental attitudes and self-medication of their children. *International Journal of Clinical Pharmacy* 35:113–120, 2013.

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**APPENDICES: COVER LETTER OF THE QUESTIONNAIRE
QUESTIONNAIRE ABOUT THE CHILDREN’S MEDICINE USE 2007
ORIGINAL PUBLICATIONS (I-IV)**

Definitions

Complementary and alternative medicine (CAM)

Complementary and alternative medicines (CAMs) are usually regarded as products and practices that are not part of conventional medicine, and which may be used as a complement or alternative to conventional care (National Center for Complementary and Alternative Medicine (NCCAM) 2014). In the literature review of this thesis, the term CAM includes a broad concept of products and practices depending on the cited publications. In the empirical part of this study, CAM is defined as traditional herbal medicinal products, homeopathics and anthroposophic products, and food supplements (excluding vitamin supplements) that are not regarded as medicines in Finland. Thus, practices such as massage therapy, chiropractic and acupuncture are excluded.

Child

The term child usually refers to humans from birth up to 18 years of age (European Medicines Agency (EMA) 2013, Child Welfare Act 417/2007). Adolescents are usually defined as population over 11 years of age (e.g. Rimpelä et al. 2004, von Rueden et al. 2006, Johnson and Wang 2008). In the literature review, the term child/children refers to children mainly under 19 years of age depending on the reference used. In the empirical part of this study, the term child is defined as children under 12 years of age, following the International Conference of Harmonization (ICH 2000) definition of children as 2- to 11-year-old and adolescents from 12 up to 18 years.

Conventional care/medicine

Conventional care and/or medicine encompasses medical treatments that are provided by registered health care professionals (NCCAM 2014).

Food supplement

Food supplements are products that usually resemble a medicinal product in their purpose of use and as they have the form of a tablet, pill, capsule, extract, powder, concentrate or liquid (Asetus ravintolisistä 78/2010, 2§). However, no medicinal purpose for the use may be presented. Food supplements are used as small doses to complement the diet, but the amount of energy they contain is low. They may contain, e.g., vitamins and minerals, or other ingredients, such as fatty acids or garlic, that may have physiological effects (Finnish Food Safety Authority (Evira) 2011, Evira 2013).

Health

The medical definition for health could be absence of disease whereas, for example, psychologists' view on health concentrates on needs and need fulfilment (Schulz and Holdford 1996). World Health Organization (WHO) defines health as physical, mental and social well-being, which does not merely mean an absence of a disease (WHO 1948). In this study, health is operationalized as self-rated health, the prevalence of long-term diseases and the occurrence of psychosomatic symptoms among children reported by their parents.

Herbal medicinal product

Herbal medicinal products have been classified as traditional herbal medicinal products or herbal medicinal products since 2005 (Finnish Medicines Agency (Fimea) 2013a). A herbal medicinal product contains herbal substances, herbal preparations or a combination of these as their active agents. Also other terms, such as natural remedies, may be used when speaking about herbal medicines (Hanssen et al. 2005). They are usually abbreviated as CAMs. In Finland, however, herbal medicinal products need marketing authorization by Fimea or European Medicines Agency (EMA), and are thus regarded as medicines (Fimea 2013).

Home remedy

In this study, home remedy is used to refer to different ways to treat children's self-limiting conditions at home, excluding medicine use. This could include remedies such as onions with brown sugar for coughing or ice water for sore throat (Gerrits et al. 1996).

Homeopathic and anthroposophic products

Homeopathic and anthroposophic products are medicinal products that are manufactured of homeopathic stocks using homeopathic manufacturing procedure, which is described in the European Pharmacopoea (Läkelaki 395/1987, 5b§, Fimea 2013). The official Pharmacopoea of a member state may also be used if the manufacturing process is not described in the European Pharmacopoea.

Over-the-counter (OTC) medicine

Over-the-counter medicine is a product that can be purchased from pharmacies without a prescription (Sosiaali- ja terveysministeriön asetus lääkkeen määräämisestä 726/2003), and it may have the form of a tablet, capsule, liquid or suppository, for example. OTC medicines are meant for alleviating, treating or preventing self-limiting conditions or for improving health (Sosiaali- ja terveysministeriön asetus lääkkeen määräämisestä 726/2003).

Prescribed medicine

Prescribed medicine is a product that may be dispensed from a pharmacy only with a prescription prescribed by a physician (Sosiaali- ja terveysministeriön asetus lääkkeen määräämisestä 726/2003).

Psychosomatic symptom

Psychosomatic symptoms are usually regarded as various physical and mental symptoms that are connected to each other and for which no specific reason to a single symptom may be found. Different studies have included for example back pain, headache, sleep disorders and dizziness as psychosomatic symptoms (e.g. Berntsson and Köhler 2001, Reinhardt Pedersen and Madsen 2002). In the empirical part of this study, psychosomatic symptoms are operationalized as symptoms of anxiety, sleep disorders, fatigue or dizziness, and depression.

Self-care

Self-care is a broad concept that encompasses all kinds of practices people do to maintain and improve health and to treat and prevent illnesses (WHO 1998, Ministry of Social Affairs and Health 2011). It comprises both individual and environmental factors such as hygiene, nutrition, sports, living conditions and socioeconomic factors. Self-medication is also a part of self-care.

Self-medication

Self-medication is usually understood as a way of treating self-limiting conditions by using medicines (WHO 1998). It may also include herbal medicines, traditional products, and prescribed medicines not originally prescribed for the purpose at hand (WHO 1998, Lilja et al. 2008). In this study, self-medication is operationalized as the use of over-the-counter (OTC) medicines and complementary and alternative medicines (CAMs).

Socioeconomic background

Socioeconomic background has been defined in several ways depending on the source. Most of the studies concerning childhood health have included education level as one indicator of socioeconomic background in addition to income (e.g. Berntsson and Köhler 2001, Chen et al. 2006a, Chen et al. 2006b), whereas some studies have operationalized socioeconomic background only as occupational status of a parent (West and Sweeting 2004, Melchior et al. 2007). In the empirical part of this study, socioeconomic background is operationalized by the highest educational background of a responding parent, household net income/month, and working status.

Traditional herbal medicinal product

Traditional herbal medicinal product is a medicinal product that consists of herbal substances or herbal preparations or combinations of these as active ingredients, and is meant for human use (Lääkelaki 395/1987, 5a§, Fimea 2013). It may also include vitamins and minerals if they improve the effect of herbal substances.

Vitamin

In Finland, a vitamin product may be classified as a registered medicine by the Finnish Medicines Agency, or as a food supplement when announcement of a new product is required for the Finnish Food Safety Authority (Finnish Food Safety Authority 2011, Finnish Food Safety Authority 2013). The use of vitamins among Finnish children has been reported in study II.

1 Introduction

Self-care using self-medication is a common way to treat minor self-limited conditions (Lilja et al. 2008). It has been estimated that in 90% of cases, people treat their symptoms with self-medication (Ahonen 2008). Over-the-counter (OTC) medicines are typically used to treat symptoms, but complementary and alternative medicines (CAMs) also have an important role in self-care (WHO 1998).

The significance of self-medication has increased during the last decades due to, for example, an increasing trend of switching prescribed medicines to OTC medicine status in many countries (WHO 2000). In Finland, nearly 40 prescribed medicines have been switched to OTC medicine status since 1986 until 2007 (Pappila 2008). In European countries, the widest selection of OTC medicines can be found in the United Kingdom and Germany, and the smallest in Croatia and Greece (Niskanen 2012). The selection of OTC medicines in Finland may be considered as slightly smaller than in European countries on average. The general knowledge of self-medication has also increased among people, due to increased information sources of self-medication on the Internet and related communication systems (WHO 2000).

It has been estimated that about half of the customers in pharmacies in Finland purchase some self-medication (Ovaskainen and Teräsalmi 2010). In spite of the wide use of self-medication, OTC medicines, for example, accounted for only 12% (323 million euros) of the total sales in pharmacies in Finland 2012, while prescription medicines accounted for 71% (1943 million euros) (Finnish Medicines Agency and Social Insurance Institution 2013). There are no official sales figures for CAMs. According to a prognosis of sales in Pharmacies for the year 2013, 7% of sales consist of other products, not regarded as medicines, while the corresponding figure for OTC medicines was 14% (Suomen Apteekkariliitto 2013). However, most of the CAM products and practices are provided outside pharmacies. In 2012, analgesics and medicines for the alimentary tract were the most common OTC medicines that had been sold from pharmacies according to their retail sale price or wholesaling price (Finnish Medicines Agency and Social Insurance Institution 2013). Ibuprofen was the most common analgesic sold, followed by paracetamol; laxatives were the most common medicines for the alimentary tract.

Among adult population, the prevalence of the use of OTC medicines has been found to be 23–28 per cent, depending on the age groups and recall period used (Del Rio et al. 1997, Bradley et al. 1998, Sihvo et al. 2000, Martins et al. 2002). Antiobesity medicines, laxatives and analgesics/antipyretics have been the most common OTC medicines reported (Del Rio et al. 1997, Sihvo et al. 2000, Martins et al. 2002). In contrast, the prevalence of the use of CAMs has varied between 12 to 42 per cent depending on the definition of CAM and the recall period used (Eisenberg et al. 1998, Hanssen et al. 2005, Barnes et al. 2008). The most common CAM products used among adult population have been reported to be vitamins and minerals, and natural remedies (Hanssen et al. 2005, Eisenberg et al. 1998, Barnes et al. 2008). Among CAM therapies, homeopathics, chiropractic, massage and acupuncture have been the most widely reported.

Self-care among children differs from that among adults, since it is usually the parent who makes the decision on the treatment used for a child (Lilja et al. 2008). Self-care and the use of self-medication, especially OTC medicines, among children were a point of interest among researchers particularly in the 1990s (e.g. Irvine and Cunningham-Burley 1991,

Kogan et al. 1994, Holme 1995, Cantrill et al. 1996, Del Rio et al. 1997, Bruijnzeels et al. 1998). After that, research in this field has been less common (e.g. Allotey et al. 2004, Slone Epidemiology Center 2006, Uijen et al. 2008, Du and Knopf 2009a, Trajanovska et al. 2010a). Most of the studies have been carried out among selected population groups through schools (Cantrill et al. 1996) or health care centers, for example (e.g. Bruijnzeels et al. 1998, Uijen et al. 2008, Trajanovska et al. 2010a), but some are population-based (Kogan et al. 1994, Slone Epidemiology Center 2006, Du and Knopf 2009a). The use of CAMs among children has become a point of interest among researchers especially in the 2000s (e.g. Simpson and Roman 2001, Menniti-Ippolito et al. 2002, Smith and Eckert 2006, Barnes et al. 2008, Zuzak et al. 2010, Nichol et al. 2011). Most of the studies have been conducted among hospital patients, for example (e.g. Madsen et al. 2003, Lim et al. 2005, Jean and Cyr 2007, Zuzak et al. 2010), and fewer are population-based (Menniti-Ippolito et al. 2002, Barnes et al. 2008, Du and Knopf 2009). Only a few studies have studied the use of OTC medicines and CAMs together as population-based (Slone Epidemiology Center 2006, Du and Knopf 2009a, Du and Knopf 2009b).

In Finland, the latest studies about the use of self-medication among children have been carried out in the 1990's (Bush et al. 1996, Arinen et al. 1998). The use of self-medication among children has been studied as part of population-based interview studies to households about health and the use of health services in Finland (Klaukka et al. 1990, Arinen et al. 1998). These studies have been conducted since 1964 by the Social Insurance Institution, with the last ones carried out in 1995 and 1996 as a collaborative effort by the Social Insurance Institution and the National Research and Development Centre for Welfare and Health. The studies focused on the whole Finnish population including children under 15 year-old. The use of OTC medicines among children was measured in 1987 and 1995/96 in these studies, and the use of complementary and alternative medicines in 1995/96. However, there is a lack of information about the most common OTC and CAM products used in 1995/96 (Arinen et al. 1998). Self-care and self-medication in Finland has also been explored as part of international co-operation involving researchers from Greece, Spain, USA, Italy, Netherlands, Germany, Yugoslavia, Denmark, England and Finland (Bush et al. 1996). This study had both quantitative and qualitative components, including 19 to 215 children in different countries.

The aim of this study was to explore the health and the use of self-medication among Finnish children and factors associated with self-medication. Self-medication includes the use of OTC medicines and CAMs. In the literature review, self-care process and the use of self-medication among children are described, including factors associated with self-medication. Studies published mainly in the 2000s are included, with the exception of the last population-based Finnish studies (Klaukka et al. 1990, Arinen et al. 1998) and a few international studies of self-care and self-medication that were considered valuable for this survey (Kogan et al. 1994, Bush et al. 1996, Eisenberg et al. 1998). As the context of this thesis, the Finnish health care system and children's health in Finland are also described.

2 Context

2.1 HEALTH CARE IN FINLAND

In Finland, primary public health care services are offered to all citizens in municipalities for a small fee (Ministry of Social Affairs and Health 2013, Health Care Act 1326/2010, 4§ and 24§, Asiakasmaksulaki 734/1992, 1§ and 2§, Asiakasmaksuasetus 912/1992, 7§). Special health care is offered in twenty hospital districts with one central hospital in each. Five of these hospitals are University hospitals, in Helsinki, Turku, Tampere, Kuopio and Oulu. In addition, private health care supports public health care by offering services directly to citizens or municipalities (Ministry of Social Affairs and Health 2013). Part of the fees in private health care is reimbursed by Social Insurance.

Mothers' and children's health is monitored regularly in prenatal care and child welfare clinics when the child is under school age (Health Care Act 1326/2010, 15§, Valtioneuvoston asetus neuvolatoiminnasta, koulu- ja opiskeluterveydenhuollosta sekä lasten ja nuorten ehkäisevästä suun terveydenhuollosta 380/2009, 9§). The aim is to ensure the physical, psychological and social development of a child and to promote the welfare of the family. Up to the time when the child is one year old, there are at least nine actoral visits, at least two of them performed by a physician, at the ages of 4–6 weeks and 8 months. The health of children over one year of age is monitored at least yearly, and once the child is of school age, his/her health is monitored yearly by school health services (Health Care Act 1326/2010, 16§, Valtioneuvoston asetus neuvolatoiminnasta, koulu- ja opiskeluterveydenhuollosta sekä lasten ja nuorten ehkäisevästä suun terveydenhuollosta 380/2009, 9§). Prenatal care, child welfare clinic and school health care are all free of charge (Asiakasmaksulaki 734/1992, Ministry of Social Affairs and Health 2013).

2.2 THE REGULATORY FRAMEWORK AND SELLING PATHWAYS OF SELF-MEDICATION IN FINLAND

2.2.1 Over-the-counter medicines

Over-the-counter (OTC) medicines are medicinal products that need a marketing authorization by the European Medicines Agency (EMA) or Finnish Medicines Agency (Fimea) in Finland (Lääkelaki 395/1987, 20a§ and 21§, Table 1). Their quality, safety and effectiveness needs to be proven by pre-clinical and clinical studies and their benefit-harm interrelationship has to be positive when taking into account the purpose of use (Lääkelaki 395/1987, 21§, European Commission 2006).

Table 1. The legal requirements and selling pathways of self-medication (European Medicines Agency (EMA), Finnish Food Safety Authority (Evira), Finnish Medicines Agency (Fimea).

Product	Self-medication			
	Over-the-counter (OTC) medicine	Complementary and alternative medicine (CAM)		
		Traditional herbal medicinal product	Homeopathic and anthroposophic product	Food supplement
Legal requirements	Marketing authorization by FIMEA or EMA	Registration by FIMEA or EMA	Marketing authorization or registration by FIMEA or EMA	Reporting to Evira
Retail outlet	Community pharmacies without a prescription	Community pharmacies, some preparations also from grocery stores and health food shops		Community pharmacies, grocery stores and health food shops

There were 550 marketing authorizations in Finland in November 2013 that have the status of OTC medicine for humans (Voipio Tinna, Fimea, personal information 2013). OTC medicines can be sold only in pharmacies (Lääkelaki 395/1987, 38§). At the end of the year 2012, there were 818 pharmacies in Finland, 18 of which were owned by the Universities of Helsinki (17 pharmacies) and Eastern Finland (one pharmacy) (Suomen Apteekkariliitto 2012). This means that there is approximately one pharmacy per 6,600 inhabitants. This figure is higher than in other Nordic Countries. For example in Sweden there are approximately 7,800 inhabitants per one pharmacy and 6,960 in Norway. OTC medicines are not reimbursed by Social Insurance. However, some of the OTC medicines (e.g. eye drops for allergy symptoms, some corticosteroid ointments for atopic eczema) are reimbursed by the Social Insurance in Finland if purchased with a prescription (The Social Insurance Institution of Finland 2013a).

2.2.2 Complementary and alternative medicines

There is no consistent regulation concerning complementary and alternative medicine (CAM) products in Finland. If there is no basis for a marketing authorization, traditional herbal medicinal products need to be registered by Fimea or EMA before getting into market, whereas homeopathic and anthroposophic products need a marketing authorization or a registration (Lääkelaki 395/1987, 22§ and 22a§, Fimea 2013, Table 1). In contrast, the Finnish Food Safety Authority (Evira) monitors the marketing of food supplements (Maa- ja metsätalousministeriön asetus ravintolisistä 78/2010, Table 1). CAMs are not reimbursed by Social Insurance in Finland.

Traditional herbal medicinal products

The requirements for the registration of traditional herbal medicinal product are that it has been in medicinal use continuously at least 30 years, of which at least 15 years in the European Union (Lääkelaki 395/1987, 22§, Fimea 2013, Table 1). In May 2013, there were eight registered traditional herbal medicinal products (e.g. Atrogel®, Crataegus®,

Gingkomax® and Kingovital®) in Finland, and all of them may be sold not only in community pharmacies but also in grocery stores and health food shops (Lääkelaki 395/1987, 38a§, Fimea 2013).

Homeopathic and anthroposophic products

For the marketing authorization of homeopathic and anthroposophic products, the quality of the product must be proven as for medicines in general (Fimea 2013, Table 1). The safety of the product needs to be shown by presenting original studies or with published literature that show that the dilution is safe in relation to the administration route. The effect of the product does not have to be demonstrated, but the homeopathic use needs to be shown on the basis of literature. However, if the purpose of use for the product is presented, the effect of the product needs to be proven as for other medicinal products.

The requirements for the registration of homeopathic and anthroposophic products are that they are meant to be administered orally or externally, and no purpose of use is presented (Lääkelaki 395/1987, 22a§, Fimea 2013). Sufficient degree of dilution is also required to ensure safety: the medicinal product may not contain more than one part per 10,000 of the mother tincture, or at maximum 1/100th of the smallest dose used as allopathy that usually requires physician's prescription.

There are over 505 registered homeopathic products and 90 registered anthroposophic products on the Finnish market (Fimea 2013). Homeopathic products may be sold in grocery stores, for example, whereas most of the registered anthroposophic products may only be sold in pharmacies (Lääkelaki 395/1987, 38a§, Fimea 2013, Table 1). There are no homeopathic or anthroposophic products that have marketing authorization in Finland.

Food supplements

Before a new food supplement gets into the market, the Finnish Food Safety Authority (Evira) needs to be apprised (Maa- ja metsätalousministeriön asetus ravintolisistä 78/2010, Table 1). The Finnish Food Safety Authority also needs to be informed if there are some changes to the content of the product or if it leaves the market. The food supplement needs to be suitable for human use in terms of its chemical, microbiological and physical quality, and the information included may not be misleading for the consumer (Elintarvikelaki 23/2006).

There are approximately 3500–4000 food supplements on the market in Finland, which are usually sold in community pharmacies, grocery stores and health food shops (Finnish Food Safety Authority 2011, Table 1). Food supplements are not reimbursed by the Social Insurance in Finland.

2.3 BENEFIT AND RISKS OF SELF-MEDICATION

Self-care and self-medication (including over-the-counter (OTC) medicines and complementary and alternative medicines (CAMs)) have many benefits for individuals and for society as well. For individuals, they are a rapid and easy way to treat self-limiting conditions with lower total costs compared to prescribed medicines (WHO 2000). It also highlights individuals' own responsibility for their health. For society, the use of self-medication is beneficial since it decreases health care costs (WHO 2000, Pappila 2008), which tend to be rising in many countries (National Institute for Health and Welfare 2013, Organization of Economic Cooperation and Development (OECD) 2011). Self-medication

also decreases costs for employers because it enables employees to continue their work instead of contacting health care services and taking sick leave (WHO 2000).

However, self-medication may also have health risks if the dosage instructions are not followed, and if it is used for the wrong indication, in which case it may cover the symptoms of a more serious disease (WHO 2000, Reinstein 2005, European Commission 2006). It may also involve risk of interactions when used together with prescribed medicines (WHO 2000, Reinstein 2005, Ahonen 2008). Since self-medication is an easy way to prevent and take care of health, it may sometimes be associated with low motivation to life-style changes; for example, if antacids are used instead of reducing coffee intake.

Among children, the use of self-medication may be beneficial to parents in a situation where they need to continue their own work and the child is having a symptom that does not require the child to stay at home (Allotey et al. 2004). However, self-medication might also predispose to inappropriate use if it is given to a child in a case when the parent needs to go work and the child should have been cared for at home.

2.4 HEALTH OF FINNISH CHILDREN

In 1996, nearly 22% of Finnish children under 15 years of age had some long-term disease (Arinen et al. 1998, Takala et al. 2001). Based on a population-based survey, the prevalence had increased since the year 1987, when approximately 12% of children of this age were reported to have some long-term disease. Having a long-term disease has been more common among older children, aged 7–14 years, than among younger ones, but the prevalence increased significantly among both age groups between the two studies (from 15% to 23% among 7-to 14-year-old children, and from 9% to 20% among 0- to 6-year-old children). However, among Finnish adolescents (aged 12 to 18 years) the prevalence of long-term disease was quite stable between the years 1980 and 2007, approximately 10% (range 7 to 12% during these years) (Rimpelä et al. 2004, Luopa et al. 2008).

The most common long-term diseases among Finnish children have been asthma and allergies (Arinen et al. 1998, Takala et al. 2001). Asthma medications have also been the most common medicines reimbursed for children, followed by medicines for diabetes, epilepsy and rheumatoid arthritis (Arinen et al. 1998, Takala et al. 2001, The Social Insurance Institution of Finland 2013b). The prevalence of asthma and allergies has increased among children during the past decades, which also mostly explains the increase in the prevalence of long-term diseases between the study years 1987 and 1996 among children aged under 15 years (Takala et al. 2001).

3 Self-Care Process Among Children

Self-care consists of several actions laymen need to consider based on the present illness, how they evaluate the severity of the symptom and how they consider the needed action. When a child gets ill, this procedure is exceptional, because the decision-maker on behalf of a child is usually the parent not the child him- or herself (Lilja et al. 2008). Thus, the decision-process of how different illnesses should be treated is largely based on the views of a parent. Figure 1 provides one model of how the self-care process among children can be described.

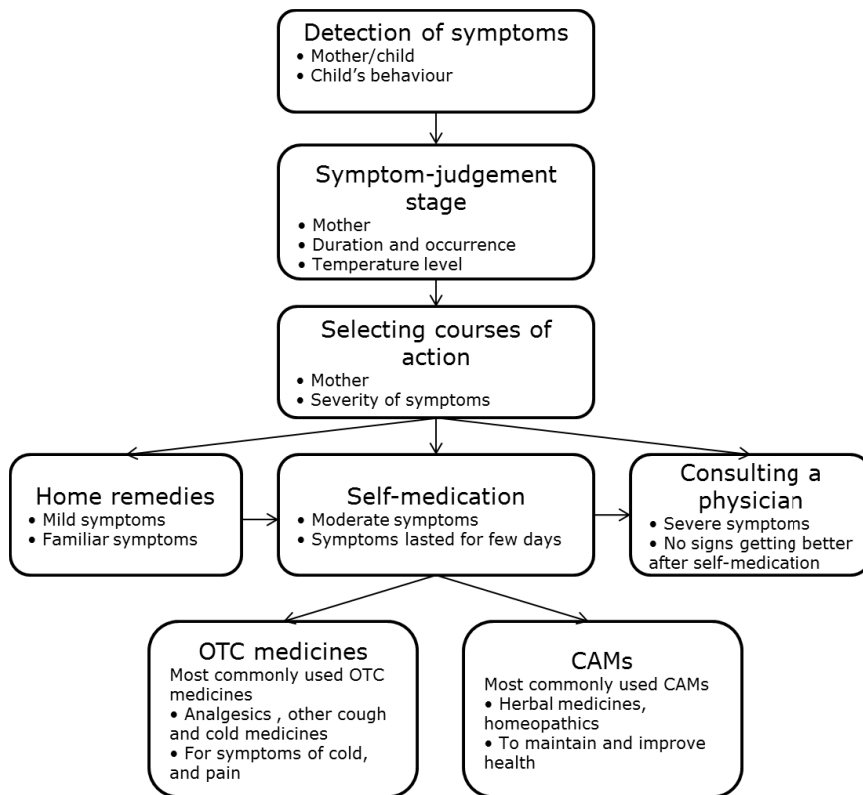


Figure 1. Self-care process among children (modified from Lilja 2008).

3.1 DETECTION OF SYMPTOMS

The first stage in the self-care process is that a persistent illness is detected (Figure 1). Usually it is a family member who may notice a symptom first rather than the individual him/herself (Lilja et al. 2008).

In the case of children, it is usually the mother who notices first that the child is not feeling well (Aramburuzabala et al. 1996, Vaskilampi et al. 1996, Figure 1). Sometimes also the child

him/herself may first notice being ill, which is afterwards confirmed by the mother (Aramburuzabala et al. 1996, Gerrits et al. 1996). Parents typically compare the child's behaviour to what is normal for their child (Lagerløv et al. 2003). Consequences of an illness may be that the child does not eat or drink as usual, or the parent sees some changes in the child's behaviour (Gerrits et al. 1996, Vaskilampi et al. 1996).

The most common symptoms children experience are usually respiratory symptoms; symptoms of cold, high temperature, cough, headache or other pains, and stomach ailments (Spencer and Coe 2000, Hay et al. 2005, Wong et al. 2007, von Linstow et al. 2008, Ishida et al. 2012). Usually, especially high fever is seen as an obvious sign of an illness (Lagerløv et al. 2003). The symptoms of cold and respiratory symptoms are common particularly among children under school age, whereas the prevalence of headaches and other pains usually increase with age and are more prevalent among adolescents (Halldórsson et al. 2000, Haugland et al. 2001, Reinhardt Pedersen and Madsen 2002, Petersen et al. 2003, Uijen et al. 2008, Ishida et al. 2012). Children experience also different psychosomatic symptoms, such as tension, nervousness, dizziness and sleep disorders, which are more prevalent among adolescents than younger children (Halldórsson et al. 2000, Reinhardt Pedersen and Madsen 2002). Despite the fact that children experience various symptoms during their life, their overall health status has usually been reported as being excellent, good or fairly good by their parents or by the children themselves (e.g. Office for National Statistics 2002, Rimpelä et al. 2004, Emerson et al. 2006, Johnson and Wang 2008, National Institute for Health and Welfare 2012).

3.2 SYMPTOM-JUDGEMENT STAGE

After a symptom is detected, its seriousness needs to be evaluated (Figure 1). It is usually the mother who evaluates the severity of the child's symptom (Vaskilampi et al. 1996, Figure 1). Depending on the severity of the symptom, parents may consult their family and friends or a pharmacy to ask for help or share the responsibility when evaluating their child's symptom (Birchley and Conroy 2002, Lilja et al. 2008). If they regard the symptom as minor, they usually only want to have reassurance for their own thoughts.

Parents evaluate the severity of the symptom on the ground of the child's behaviour, face colour and occurrence of uncommon symptoms (Gerrits et al. 1996, Figure 1). The temperature level plays a major role when determining the severity of an illness and the action applied. Many parents regard high temperature as one of the signs of severe symptoms and base their decision as to how to treat an illness on the temperature level (Gerrits et al. 1996, Vaskilampi et al. 1996). However, there are differences in the temperature level parents regard as fever, and also in how they define high temperature (Walsh et al. 2007). The level considered as fever by parents has varied between 36.7°C and 40.5°C in different studies (Vaskilampi et al. 1996, Walsh et al. 2007, Walsh et al. 2008, Erkek et al. 2010).

3.3 THE STAGE OF SELECTING COURSES OF ACTION

After a child's symptom is evaluated, the parents need to decide how to deal with the symptom, and whether the child should stay at home or whether he/she may go to school (Aramburuzabala et al. 1996, Gerrits et al. 1996, Vaskilampi et al. 1996). The decision is mainly based on the severity of the illness.

It has been shown that it is the mother who takes care of the child and decides how to treat the symptom when the child is ill (e.g. Aramburuzabala et al. 1996, Gerrits et al. 1996, Vaskilampi et al. 1996, Geissler et al. 2000, Lagerløv et al. 2003, Figure 1). However, in a study of different locations in Spain, Greece, Finland, and the United States, the parents in Finland and Spain also mentioned the father as a decision-maker more often than parents in other locations, whereas in Spain and Greece also grandparents had a role in taking care of their grandchild during an illness episode (Aramburuzabala et al. 1996, Vaskilampi et al. 1996).

3.3.1 Home remedies

If the parent considers the child to have non-severe, mild illness, it is usually taken care at home (Gerrits et al. 1996, Figure 1). Parents may wait and see how the symptom develops and use home remedies to help the child to feel better. Various drinks, such as tea and fruit juices, and massage e.g. in the case of back and belly pain may be given to the child.

3.3.2 Self-medication

Self-medication is usually given as a first course of action if the parent considers that the child has more severe, moderate symptoms, or if the symptoms have lasted for a few days without any progress (Gerrits et al. 1996, Wong et al. 2007, Figure 1). Parents may consider the need for self-medication also on the ground of additional factors, such as the child's behaviour and well-being, and whether there are, e.g., sleep disturbances or loss of appetite (Walsh et al. 2007). Usually the action applied is based on their own experience and information they have (Gerrits et al. 1996). Family and friends may also have a role, mainly to share experiences with rather than asking for advice. Mass media may also be a source of information for parents.

3.3.2.1 Over-the-counter (OTC) medicines

OTC medicines purchased from a pharmacy or independently taken prescription medicines from a medicine cabinet at home, even if not originally prescribed for the present illness, are typically used as a form of self-medication (Gerrits et al. 1996, Lilja et al. 2008, Figure 1). They may also be used together with home remedies (Ahonen et al. 1996). According to different studies, 8–63% of children had used some OTC medicine depending on the recall period, age of the children, and how the use of OTC medicines is defined in different studies (e.g. Kogan et al. 1994, Westerlund et al. 2008, Carrasco-Garrido et al. 2009, Du and Knopf 2009a, Moraes et al. 2011). In Finland, the last studies from 1987 and 1995–96 showed that approximately 13% of children under 7 years of age and 8% of children 7–14 years of age had used some OTC medicine in the preceding two days in 1995–96 (Arinen et al. 1998). The proportions were mainly on the same level as in the year 1987, with a slight decrease among 0- to 6-year-old children (15% of 0- to 6-year-old children and 8% of 7- to 14-year-old children in 1987) (Klaukka et al. 1990).

The use of OTC medicines has been common especially among children under school age (under 7 years) (Klaukka et al. 1990, Arinen et al. 1998). However, some studies have found the use of self-medication to be most common among adolescents (14- to 17-year-old) (Du and Knopf 2009a, Ishida et al. 2012). According to genders, the findings of the use of OTC medicines are somewhat inconsistent. A few studies have indicated that the use of OTC medicines is more common among girls than among boys (Ahonen et al. 1996, Tobi et al. 2003, Du and Knopf 2009a), especially at the age of 7 years and over (Arinen et al. 1998, Holstein et al. 2003, Tobi et al. 2003), whereas one study found this association to be reversed if used occasionally (Westerlund et al. 2008).

The most common OTC medicines given to children have been analgesics and antipyretics, especially paracetamol, and other cough and cold medicines (e.g. Klaukka et al. 1990, Kogan et al. 1994, Arinen et al. 1998, Vernacchio et al. 2009), which are medicines that may be used to treat typical childhood symptoms, such as fever and pain (Lagerløv et al. 2003, Trajanovska et al. 2010b). These medicines have also been the most common preparations that parents usually purchase from the pharmacy and already have at home, in addition to vitamin and mineral supplements (Ahonen et al. 1996, Wong et al. 2007, Trajanovska et al. 2010a, Trajanovska et al. 2010b). However, parents have sometimes reported using OTC medicines such as paracetamol or sedative antihistamines as “social medication” to induce sleep or to calm the child down (Allotey et al. 2004, Trajanovska et al. 2010b).

3.3.2.2 Complementary and alternative medicines (CAMs)

CAMs, including different products and therapies, may also be used as a form of self-medication, although they are not usually the first course of action (Gerrits et al. 1996). Based on previous studies, the use of CAMs among children varies between 4% and 67%, depending on how CAM has been defined and/or the length of the recall period (e.g. Menniti-Ippolito et al. 2002, Slone Epidemiology Center 2006, Smith and Eckert 2006, Barnes et al. 2008, Wadhera et al. 2011, Gottschling et al. 2013). The use has been common especially in families where either parent uses some CAM (e.g. Menniti-Ippolito et al. 2002, Barnes et al. 2008). In Finland, the prevalences of the use of CAMs among children was found to be approximately 4% among children aged under 7 years and 6% among 7- to 14-year-old children in 1996 (Arinen et al. 1998).

CAM use has been consistently found to be equally common among both genders (Simpson and Roman 2001, Madsen et al. 2003, Crawford et al. 2006, Barnes et al. 2008, Du and Knopf 2009b), whereas according to age, there are distinctions in the results between different studies. Some studies have reported CAM use to increase with age, being most common among adolescents (Arinen et al. 1998, Loman et al. 2003, Lim et al. 2005, Barnes et al. 2008), while some studies have not found any association between child’s age and CAM use (Simpson and Roman 2001, Madsen et al. 2003, Noonan et al. 2004, Crawford et al. 2006, Smith and Eckert 2006). Some studies have found an association between age and gender and CAM use depending on the type of CAM used. For example, in the USA according to National Health Statistics reports 2008, girls were more likely to use mind-body therapies than boys (Barnes et al. 2008), and in an Australian study, massage was most commonly used among children aged 0–4 years (Smith and Eckert 2006).

The most commonly reported CAMs given and used among children have been herbal medicines, chiropractic treatment, homeopathy, massage, and vitamins and minerals (e.g. Simpson and Roman 2001, Menniti-Ippolito et al. 2002, Madsen et al. 2003, Smith and Eckert 2006, Jean and Cyr 2007, Barnes et al. 2008). In Finland, the most commonly used CAM products among children were not reported in the last study 1996, but the most frequently used CAMs in the whole study population, including children and adults, were calcium, silicon and vitamin C preparations (Arinen et al. 1998).

Indications for the use of CAM

The reasons for using CAM for children have most commonly been to prevent, maintain and improve health, and to strengthen the immune system (e.g. Lim et al. 2005, Cincotta et al. 2006, Smith and Eckert 2006, Zuzak et al. 2009, Gottschling et al. 2013); especially herbal medicines and vitamins have been used for these purposes (Madsen et al. 2003, Smith and Eckert 2006). However, also a number of health conditions have been found to be associated with CAM use (Madsen et al. 2003, Barnes et al. 2008), and it has been reported that CAMs are also given to children for the treatment of typical childhood symptoms, such as respiratory symptoms, fever, cough and cold, colic or diarrhoea (e.g. Pitetti 2001, Smith and Eckert 2006, Walsh et al. 2007, Barnes et al. 2008, Araz and Bulbul 2011, Italia et al. 2012). Various treatments are used for these symptoms, such as herbal medicines and homeopathics (Lim et al. 2005, Italia et al. 2012). Sometimes CAMs are used for the treatment of musculoskeletal problems, such as back or neck pain (Loman 2003, Smith and Eckert 2006, Jean and Cyr 2007, Barnes et al. 2008); massage and chiropractic therapy are most commonly used for this purpose (Loman 2003, Smith and Eckert 2006).

Many studies have also reported CAM use among children that have some chronic disease (Simpson and Roman 2001, Noonan et al. 2004, Low et al. 2008, Oshikoya et al. 2008, Wood and Finlay 2011), such as cancer (e.g. Laengler et al. 2008, Tomlinson et al. 2010), asthma (e.g. Sidora-Arcoleo et al. 2007, Oshikoya et al. 2008, Shen and Oraka 2012), autism (Wong and Smith 2006), or diabetes (Loman 2003, Miller et al. 2008). In chronic diseases, CAMs are usually mainly meant for strengthening the immune system and helping to cope with the side effects of conventional care or symptoms of a disease rather than for treating a specific disease (e.g. Madsen et al. 2003, Wong and Smith 2006, Laengler et al. 2008, Wood and Finlay 2011). Usually they are used alongside conventional care (Shaw et al. 2006, Laengler et al. 2008, Wood and Finlay 2011). Among cancer patients one of the predictive factors where parents have given or considered giving CAM for their child have included poor prognosis, relapse of a disease or a child in palliative care, which implies that CAM is also used as a last resort (Gomez-Martinez 2007, Tomlinson et al. 2010). Among asthmatic children, poorly controlled asthma and the prescribed medication not having been effective have also been associated with the use of CAM (Shen and Oraka 2012).

Referral for CAM use

Most of the CAM treatments administered to children are self-initiated by the parents, or recommended by relatives and/or friends (e.g. Simpson and Roman 2001, Lim et al. 2005, Cincotta et al. 2006, Crawford et al. 2006, Zuzak et al. 2009, Wood and Finlay 2011, Gottschling et al. 2013). Parents have usually reported giving CAM to their child after having tried conventional medicines without success (Simpson and Roman 2001, Nichol et al. 2011, Wood and Finlay 2011). Sometimes CAM is used together with conventional medicines (Jean and Cyr 2007, Wood and Finlay 2011). However, one study reported that sometimes parents give OTC medicines to their child after trying CAMs without a success (Walsh et al. 2007). The reasons for choosing CAM have been the idea that they are safe, and on the other hand, fear of side effects and dissatisfaction with conventional medicines (Simpson and Roman 2001, Menniti-Ippolito et al. 2002), but also the opportunity to have more options in health care of children and to increase the likelihood that something is helpful for their child (Zuzak et al. 2009, O'Keefe and Coat 2010, Nichol et al. 2011).

3.3.3 Consulting a physician

A physician is usually consulted in severe symptoms of a child, if the symptoms have lasted for a few days without any signs of getting better in spite of the self-medication or home remedies used (Ahonen et al. 1996, Gerrits et al. 1996, Ecklund and Ross 2001, Uijen et al. 2008, Trajanovska et al. 2010a). A physician is also consulted if the symptoms appear rapidly and/or are such that the parent does not know how to treat them (Ecklund and Ross 2001, Lagerløv et al. 2003). Usually the decision-maker as to whether a physician should be contacted is the mother, but also fathers have a role in these decisions, especially in acute cases and at weekends (Gerrits et al. 1996).

The most common reasons for consulting a physician have been respiratory symptoms, mainly ear infections, fever and rashes (Ecklund and Ross 2001, Takala et al. 2002, Hay et al. 2005, Uijen et al. 2008). The type of symptom may have an effect on how soon a physician is consulted. For example, if the child has a high temperature, wheeziness, vomiting or diarrhoea, rash or earache, parents would seek advice within two days (Trajanovska et al. 2010a). In contrast, in the case of sleep difficulties, for example, they would wait one week.

A physician is usually consulted more often when the child is under school-age (Office for National Statistics 2002, Halldórsson et al. 2002, Uijen et al. 2008, Ishida et al. 2012), which is natural considering that younger children experience most often different symptoms, such as respiratory symptoms, especially infections, compared to older ones (Victorino and Gauthier 2009). Younger maternal age has been found to predict the use of health care service in children's conditions (Ecklund and Ross 2001, Birchley and Conroy 2002, Hay et al. 2005), which may be due to less experience in treating different symptoms compared to older parents. Also parents with one child have been found to consult a physician more commonly than parents with more than one child (Ishida et al. 2012). Families with one child have also been found to have more often prescribed medicines at home than families with more than one child (Ahonen et al. 1996).

Living area may also have an effect on how common it is to consult a physician in children's ailments. Some studies have shown that children living in urban areas use more health services than children living in rural areas (Halldórsson et al. 2002, Takala et al. 2002, Uijen et al. 2008). However, one study showed this association as reverse, and it was found that rural parents consulted a physician more often as a first course of action in a mild illness while urban parents tried first self-treatment (Hoa 2007). The decision-process may also depend on the costs and accessibility of health care services (Lilja et al. 2008, Aoyama et al. 2012). In addition, if the child has private insurance, parents may contact medical care more readily than if they do not have insurance for their child (Duderstadt et al. 2006).

3.4 FACTORS ASSOCIATED WITH HEALTH, SELF-CARE AND SELF-MEDICATION AMONG CHILDREN

3.4.1 Culture

Culture plays an important role in how different symptoms are detected and regarded as a medical problem (Lilja et al. 2008, Figure 2). There are distinctions between countries in how parents perceive children's symptoms and which actions they choose to take. There might also be cultural variations in the use of self-medication within a country. These differences have been found for example among children with the use of anti-asthmatic medication (Cantarero-Arévalo et al. 2013, Cantarero-Arévalo et al. 2014).

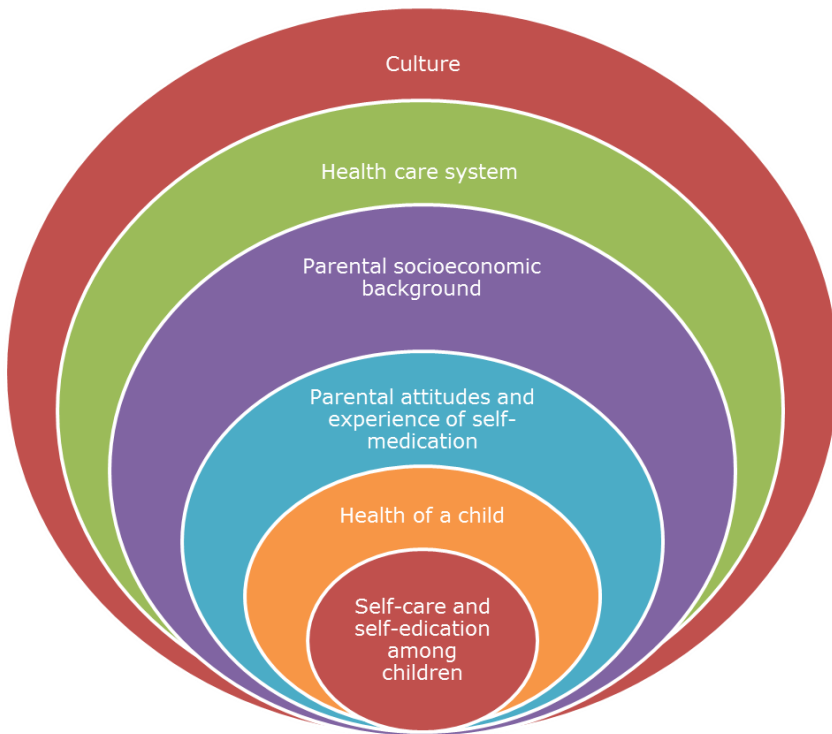


Figure 2. Factors associated with self-care and self-medication among children.

Variations have been observed in the use of OTC medicines as symptom treatment concerning specific childhood symptoms (Vaskilampi et al. 1996). In Finland, parents usually try home remedies first, such as hot or cold drinks (Ahonen et al. 1996). This was also found in a descriptive study of different locations in Europe and the USA (Vaskilampi et al. 1996). In the USA, Spain and Greece, a majority of responding parents reported treating the child with OTC medicine when the child had fever compared to children in Finland, where only about half of the children were given OTC medicine to treat fever. In addition, the majority of responding parents (70%) in Greece and Spain consulted their physician when their child had fever whereas half of the parents in the USA and only one third of the parents in Finland consulted a physician (Vaskilampi et al. 1996). Consulting a physician rather than using OTC medicines for a child's fever has also been found in Denmark and Japan. According to qualitative and quantitative studies, over 90% of parents reported taking their child to see a physician if he/she had high (39°C) fever (Jensen et al. 2010, Aoyama et al. 2012). The reasons for this were that parents felt they should not make their own judgements, and also because the medical treatment of children is free of charge (Aoyama et al. 2012). In contrast, no cultural differences have been seen as to which OTC medicine is most commonly used among children. Analgesics and antipyretics, especially paracetamol, have been the most widely reported OTC medicines in different studies from Europe and the USA (e.g. Klaukka et al. 1990, Kogan et al. 1994, Arinen et al. 1998, Slone Epidemiology Center 2006).

There are also cultural differences in the use of CAMs among children, determining which products and practices are most commonly used in different countries. Herbal medicine use in children has been commonly reported in Australia, United States and in Northern and Western Europe, such as Ireland, Wales and Denmark (e.g. Madsen et al. 2003, Lim et al. 2005, Crawford et al. 2006, Smith and Eckert 2006, Low et al. 2008, Barnes et al. 2008, Huillet et al. 2011, Wadhwa et al. 2011), whereas homeopathic remedies, for example, have been quite widely used in Canada, England, and Southern and Central Europe, such as in Italy, Germany and Switzerland (Pitetti 2001, Simpson and Roman 2001, Menniti-Ippolito et al. 2002, Jean and Cyr 2007, Zuzak et al. 2010, Italia et al. 2012, Gottschling et al. 2013).

There are also distinctions in the symptom treatment and CAM use between developing and developed countries. In developing countries, self-treatment has a major role in health care due to higher costs of private health care (Geissler et al. 2000). Herbal medicines are widely used for example for abdominal pain, wounds and skin infections. However, quite many (58%) of the mild symptoms in particular are also left untreated. The use of traditional medicines as symptom treatment in developing countries may also depend on the socioeconomic background of the parent. According to a qualitative study from South Africa, more highly educated parents preferred using OTC medicines for their child as symptom treatment whereas parents with low education preferred traditional medicines (Friend-du Preez et al. 2013).

3.4.2 Parental socioeconomic background

Parental socioeconomic background, mainly education, income and/or employment status, has been shown to have an impact not only on the use of self-medication among children, but also on the health of children (Figure 2).

Several studies have shown that low parental socioeconomic background is associated with different adverse health variables of children (Emerson et al. 2006, von Rueden et al. 2006, Victorino and Gauthier 2009), such as psychosomatic symptoms, chronic illnesses, and/or poorer self-rated health reported by their parent or themselves compared to children with high parental socioeconomic background (e.g. Halldórsson et al. 2000, West and Sweeting 2004, Bauman et al. 2006, Currie and Lin 2007, Johnson and Wang 2008, Victorino and Gauthier 2009). In addition, a few studies have also indicated that the presence of multiple social risk factors (e.g. poor education, poverty, family structure, and family conflict) have a cumulative effect on children's poor health (Bauman et al. 2006, Larson et al. 2008) and that parental low socioeconomic background in childhood may also predict poor health in adulthood (Melchior et al. 2007). However, one study suggests that family income is not a major determinant of predicting child's health (Currie et al. 2007).

There are only few studies that have explored the association between parental socioeconomic background and children's use of OTC medicines. Most studies have found that high socioeconomic background of at least one parent is positively associated with OTC medicine use among children and adolescents (Kogan et al. 1994, Ecklund and Ross 2001, Tobi et al. 2003, Ishida et al. 2012). It might be that more highly educated parents are more confident in using OTC medicines for their child (Aoyama et al. 2012). However, a reverse finding was made in a Danish study where low social class of adolescents, according to parents occupation, was found to be associated with increased use of medicines for specific symptoms compared to adolescents from higher social class (Holstein et al. 2004).

CAM use among children has typically been found to be more common in high-income families, and/or with a more highly educated parent (e.g. Crawford et al. 2006, Smith and Eckert 2006, Du and Knopf 2009b, Zuzak et al. 2009, Birdee et al. 2010, Gottschling et al. 2013). However, some studies have not found any significant association between parental

income and/or education and CAM use among children (e.g. Pitetti 2001, Simpson and Roman 2001, Zuzak et al. 2009, Huillet et al. 2011, Italia et al. 2012). Sometimes CAMs form an important part of symptom treatment in self-care due to their lower costs compared to conventional medicines, especially in low socioeconomic families (Barnes et al. 2008).

3.4.3 Parental attitudes

Attitudes have an impact on how different forms of self-medication are seen by the parents, and it has been shown that parental attitudes also affect how children's self-limiting conditions are treated (Figure 2).

Attitude toward OTC medicines

Parents have various views concerning OTC medicines and medicine use for their children. According to a descriptive study, some parents consider that OTC medicines are not as effective as prescribed medicines, except for the ones that have been transferred from prescription only status (Ahonen et al. 1996). In addition, some OTC medicines, such as paracetamol, are regarded as safe by parents (Birchley and Conroy 2002, Lagerlöv et al. 2003), especially since they are sold over-the-counter (Birchley and Conroy 2002). In contrast, sometimes parents think that OTC medicines are unnatural for the human body (Ecklund and Ross 2001) and should only be used when needed (Ahonen et al. 1996, Gerrits et al. 1996). Parents have been shown to be worried about the adverse effects of medications used for fever and pain and regard them as harmful for the child (Walsh et al. 2007, Rony et al. 2010). According to descriptive studies, many parents also think that OTC medicines should be administered only at the lowest dose that helps (Gerrits et al. 1996, Rony et al. 2010).

However, the treated symptom may also cause worry for the parents if left untreated. For example, according to studies concerning the management of fever, most parents think that fever could be harmful for their child, causing e.g. seizure or brain damage (Walsh et al. 2008, Erkek et al. 2010, Jensen et al. 2010). To avoid these harmful effects, lowering temperature level with OTC medicines is preferred, sometimes also at quite low levels of temperature.

Previous studies have also shown that parental views, experiences, and attitudes toward medicines influence how they assess the need for medication for their children in different health conditions (Ecklund and Ross 2001, Kankkunen et al. 2008, Jensen et al. 2010). For example, it has been shown that parents with positive attitudes toward medicines are more willing to medicate their child's pain than those who have negative thoughts on the matter (Rony et al. 2010).

Attitude toward CAMs

A typical feature of CAMs is that they are often regarded as natural and safe compared to Western drugs (Crawford et al. 2006, Hoa et al. 2007, Jean and Cyr 2007, Nichol et al. 2011, Wadhwa et al. 2011). Some parents regard illness as a nutritional or chemical imbalance, and CAM is seen as a support for the body helping natural healing to occur (O'Keefe and Coat 2010). It also offers holistic care for the treatment of illnesses, not only concentration on a specific symptom (Simpson and Roman 2001, Nichol et al. 2011).

Some parents think that CAMs are more effective than conventional therapies (Wadhwa et al. 2011), and many parents have reported that CAM has been at least partially helpful for their child (Pitetti 2001, Simpson and Roman 2001, Lim et al. 2005, Zuzak et al. 2010, Wadhwa et al. 2011). However, according to a cross-sectional survey, parents have considered CAM to be less effective than conventional medicines, but they think that in

certain cases it may also be more effective than conventional medicines (Zuzak et al. 2010). CAMs that have been reported to be helpful for children have included special diets, melatonin, megadoses of vitamins and massage (Huillet et al. 2011).

4 Summary of the Literature

The most common symptoms experienced by children are symptoms of common cold, especially among young children under school age. In contrast, among school-aged children, different psychosomatic symptoms become prevalent and tend to increase with age. Among long-term diseases, allergy and asthma have been found to be the most common among children. Despite the common experience of different symptoms, children's health is usually reported as being good by the parents.

In families, it is usually the mother who detects and evaluates the child's symptoms and makes the decision on the treatment chosen. For mild symptoms, the first course of action is usually to use home remedies and wait and see how the health of the child develops. Self-medication is typically used for moderate symptoms, if the symptoms have lasted for a few days, and/or if there is no help from home remedies. Analgesics and antipyretics, especially paracetamol, are the most common OTC medicines used, while herbal medicines are the most common CAMs used. The main purpose of the use of CAM is especially to improve and maintain health. If the symptoms are severe, uncommon and/or self-medication does not help, a physician is usually consulted.

Parental socioeconomic background was found to be associated with children's health and also with the use of self-medication, especially CAMs. Low parental socioeconomic background was associated with poor health among children. In contrast, high parental socioeconomic background was found to predict the use of OTC medicines and CAMs.

Parents also have various thoughts concerning medicine use for their children, which sometimes affect how they medicate their children with self-medication. Parental attitudes toward medicines are associated with the use of OTC medicines and CAMs; parental positive attitude toward medicines predicts the use of OTC medicines, and on the other hand, parental negative orientation and worry about medicine use predicts the use of CAMs for their children.

5 Aims of the Study

The aim of this study was to explore the health of Finnish children under 12 years of age and the patterns of the use of self-medication, including OTC medicines and CAMs among them.

The specific aims were to:

1. determine children's health, including the self-rated health reported by the parent, prevalence of long-term diseases and the experience of symptoms,
2. assess how common the use of self-medication is among children and which types of self-medication are most commonly used,
3. determine which factors, such as parental socioeconomic background and attitudes toward medicines, are associated with health and the use of self-medication among children.

6 *Methods*

6.1 STUDY POPULATION AND DATA COLLECTION

This survey was conducted in the spring (February–April) of 2007 as a postal survey by the School of Pharmacy, University of Eastern Finland. As a research method, postal survey was chosen in order to gain information on medicine use among children in a large sample. The study population consisted of a representative sample of 6,000 Finnish children under 12 years of age, living in Finland in the end of 2006 (Figure 3). Children under this age were selected to the study population since the International Clinical Harmonization (ICH 2000) classifies children aged 2–11 years as children, and children over 11 years as adolescents. In addition, children older than 11 years of age became more independent in medicine use. The respondents should have been the children themselves if children older than 11 years of age had been included.

The size of the study population was considered, in co-operation with a statistician, according to the previous population-based study in Finland (Klaukka et al. 1990) to have significant differences in the results when using age groups of 0–2, 3–6 and 7–11 if a response rate of 70% was gained (Figure 3). The study population was randomly selected from the database of the Finnish National Population Register Centre which covers information on everyone living permanently in Finland. Children in institutional care, under custody or those in situations with a restraining order of the parent were excluded from the study.

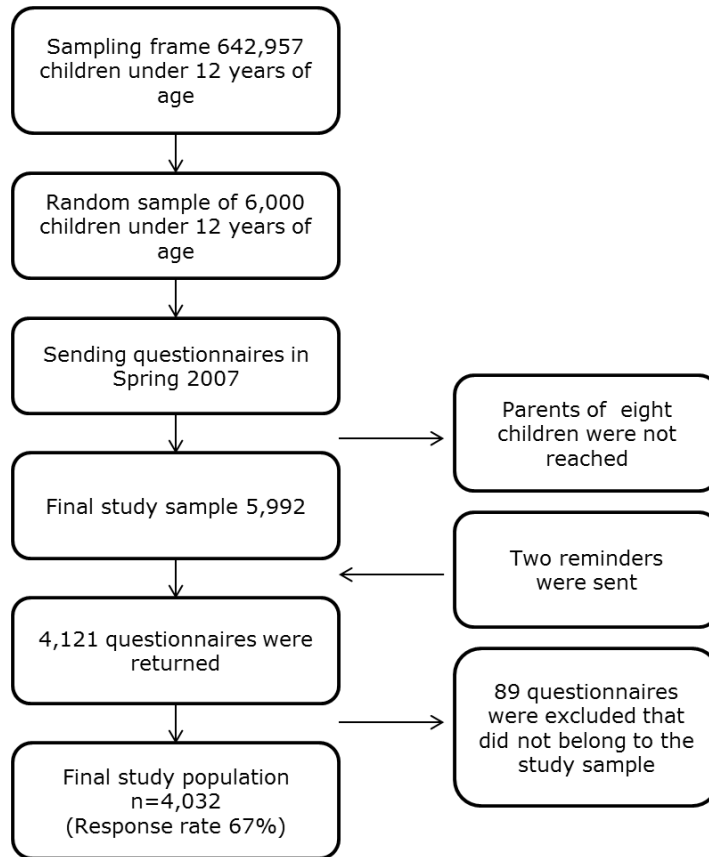


Figure 3. Data collection process.

A 6-page questionnaire was sent to parents, primarily to the mothers, and it was directed to the parent who usually takes care of the child's medication (Appendix 1, Appendix 2). The questionnaire was available in Finnish and Swedish, both of which are official languages in Finland. The child's name was printed on the questionnaire to indicate which child in the family was included in the study sample. On return of the questionnaire, the name of the child was removed and replaced by a random number to ensure confidentiality.

Two reminders were sent. However, parents of eight children were not reached by mail, and thus the study sample consisted of 5,992 children. In total, 4,121 questionnaires were returned after the reminders. In 89 of the questionnaires, the parent had filled in information on behalf of a child who was not included in the initial study population, and these were excluded from the study population. Thus, the final study population included 4,032 children, with a response rate of 67%. Most of the respondents (95%) were mothers.

6.2 CONTENT OF THE QUESTIONNAIRE

The questionnaire consisted of the following sections: background information of the child (e.g. age, gender and current symptoms), the child's medicine use, the information sources used about the child's medication, and background information of the parent (e.g. medicine use by the parent and statements of parental attitudes toward medicines) (Appendix 2). Before sending the questionnaire, it was pilot-tested with a convenience sample of 61 mothers, and minor modifications were made based on the pilot. The pilot-study also included a focus group discussion of a convenience sample of five mothers.

6.2.1 Main outcome measures

The main outcome measures of this study were child's health (I) and the use of self-medication; OTC medicine (II, IV) and CAM use by the child (II, III, IV, Table 2).

Table 2. Description of the main outcome measures, background variables and statistical analyses used in different studies.

	Main outcome measures	Background variables	Statistical analyses
Study I	<ul style="list-style-type: none"> • Child's self-rated health reported by the parent • Current psychosomatic symptoms of a child • Current long-term disease of a child diagnosed by a physician 	<ul style="list-style-type: none"> • Socioeconomic status: <ul style="list-style-type: none"> - highest level of education of a parent - household net income/month (€) - working status of a parent • Adjusted for: <ul style="list-style-type: none"> - Child's age and gender - number of long-term diseases - presence of impairments - presence of other diseases - number of psychosomatic symptoms - number of other symptoms 	<ul style="list-style-type: none"> • Pearson's Chi-square-test • Multivariate logistic regression analysis
Study II	<ul style="list-style-type: none"> • The current use of prescribed medicines • The use of self-medication: OTC medicines, vitamins and CAMs use in the preceding two days 	<ul style="list-style-type: none"> • Child's <ul style="list-style-type: none"> - age and gender 	<ul style="list-style-type: none"> • Pearson's Chi-square-test

(Table 2. Continued)

Table 2. (Continued)

	Main outcome measures	Background variables	Statistical analyses
Study III	<ul style="list-style-type: none"> The use of CAMs in the preceding two days 	<ul style="list-style-type: none"> Child's <ul style="list-style-type: none"> age and gender birth order number of prescribed medicines used number of OTC medicines used number of vitamins used health status number of symptoms number of doctor-diagnosed illnesses Parent's <ul style="list-style-type: none"> age highest level of education households net income/month (€) working status number of prescribed medicines used number of OTC medicines used number of vitamins used number of CAMs used 	<ul style="list-style-type: none"> Pearson's Chi-square-test Multivariate logistic regression analysis
Study IV	<ul style="list-style-type: none"> The use of OTC medicines and CAMs in the preceding two days 	<ul style="list-style-type: none"> Parental attitudes toward medicines: <ul style="list-style-type: none"> General attitude toward medicines Attitude toward prescription medicines Attitude toward OTC medicines Attitude toward the risks of medicines Attitude toward the long-term use of pain-killers Adjusted for: <ul style="list-style-type: none"> Child's <ul style="list-style-type: none"> age and gender presence of doctor-diagnosed illnesses number of symptoms health status number of children in the family Parent's <ul style="list-style-type: none"> age highest level of education households net income/month (€) working status use of prescribed medicines use of OTC medicines use of CAMs 	<ul style="list-style-type: none"> Pearson's Chi-square-test Univariate logistic regression analysis Multivariate logistic regression analysis

Child's health

Child's health was determined with self-rated health, the prevalence of long-term diseases and psychosomatic symptoms. Self-rated health was explored by asking the parent to report the current health status of the child on a 5-item Likert scale (good, fairly good, moderate, fairly poor or poor), and classified as "Good n=3,249", "Fairly good n=631", and "Moderate

n=106, fairly poor n=25 and poor n=5" (Appendix 2). However, for the purpose of the analysis of study I, children's self-rated health was classified as "Moderate or poor" (including moderate, fairly poor and poor), and as "Good" (including fairly good and good) to make a distinction between poor and good health as has been done in some other studies in this field (e.g. West and Sweeting 2004, Chen et al. 2006a, Chen et al. 2006b, Luopa et al. 2008).

The prevalence of long-term diseases was identified by asking the parent to report if the child had any diseases or injuries currently diagnosed by a physician (Appendix 2). Of the reported diseases, asthma, allergy, epilepsy, diabetes, lactose-intolerance, migraine, attention deficit hyperactivity disorder (ADHD), heart defect, atopy, rheumatoid arthritis, and coeliac disease were considered long-term diseases.

The prevalence of psychosomatic symptoms was determined by presenting a list of 11 symptoms and asking a parent to circle "Yes" or "No" depending on whether the child had any of these symptoms currently, i.e. at the moment when answering the questionnaire (Appendix 2). There was also a possibility to answer "Don't know" or to report other symptoms not presented in the list. In the symptoms list, the following symptoms were classified as psychosomatic symptoms: sleep disorders, fatigue or dizziness, anxiety and depression.

Use of self-medication

The use of self-medication was determined by instructing the parent to write down the names of any OTC medicines given to their child, including vitamin products, in the preceding two days (Appendix 2). In a similar way, the use of CAMs was measured by asking the parent to report the names of medicinal herbs, botanicals or homeopathic remedies that the child had used in the preceding two days. The short recall period of two days was chosen in order to limit recall bias and to get comparable results with a previous population-based study in Finland (Arinen et al. 1998).

6.2.2 Background variables

Parental socioeconomic background

Parental socioeconomic status was measured by asking the parent to report the highest education level from a 7-item list and household net income/month from an 11-item list (Appendix 2). The highest education of parent was classified as Junior high school or less (≤ 9 years), Senior high school/vocational school (11–13 years), Polytechnic, College or university degree (≥ 15 years). In addition, the following categories were formed of the household monthly net income/month: below €1,999, €2,000–2,999, €3,000–3,999 and €4,000–10,000. Working status of the parent was classified as "Working" and "Not in work" in studies I and III. Class "Not in work" included parents who were unemployed, at home with children, retired, studying, or on sick leave. In study IV, working status of a parent was classified as "Working or studying", "Home with children", and "Not in work" (including persons on sick leave and retired or unemployed persons).

Parental attitudes

Parental attitudes toward medicines were measured by a 21-item list of statements concerning medicine use in general and giving medicines to a child (Appendix 2). The attitudinal scale was created by the researchers on the basis of previous research results and it is described elsewhere (Hämeen-Anttila et al. 2011). Dimensions concerning parental attitudes toward medicines were discovered in the pilot focus group discussion; as a result, it was assessed whether the statements covered these dimensions.

Based on the focus group discussion, the statement “interactions between medicines worry me” was added to the statement list.

Parents were directed to answer the statements according to a 6-item Likert scale (1=I disagree completely, 2=I disagree, 3=I don't agree or disagree, 4=I agree, 5=I agree completely, or 0=no opinion). A Principal Components Analysis with oblimin rotation, which is described elsewhere (Hämeen-Anttila et al. 2011), was used to discover dimensions in parental attitudes. Based on the analysis, five principal components were formed (including 18 statements) (Table 3). The principal components were named as follows: “General attitude toward medicines”, “Attitude toward prescription medicines”, “Attitude toward OTC medicines”, “Attitude toward the risks of medicines”, and “Attitude toward the long-term use of pain-killers”. The reliability of the Principal Component Analysis was satisfactory (Cronbach's alpha between 0.566 and 0.754).

Table 3. The five principal components of parental attitudes and the statements they include (Hämeen-Anttila et al. 2011).

Component
<p>Component 1: general attitude toward medicine Fever, a natural means of defence of the child's body, should not be lowered artificially with medicines The child needs to learn how to bear pain I try to take care of my child's ailments by some other means than using medicines I try to avoid giving medicines to my child I usually give less analgesics to the child than recommended in the instructions Medicines can disturb the body's own capability to heal illnesses Medicines are unnatural to the human body</p>
<p>Component 2: attitude toward prescription medicines Prescription medicines are effective Prescription medicines are safe Medicines that a doctor has prescribed for the child are necessary Medicines are necessary in treating illnesses</p>
<p>Component 3: attitude toward OTC medicines OTC medicines are effective I take care of my child's minor ailments by using OTC medicines Over-the-counter (OTC) medicines are safe</p>
<p>Component 4: attitude toward the risks of medicines Interactions between medicines worry me Side effects of children's medicines worry me</p>
<p>Component 5: attitude toward the long-term use of pain-killers Long-term use of analgesics reduces the pain threshold The more you need to use analgesics the less effective they are against pain</p>

Scale scores were created by computing the averages of the original responses to the items in each scale, and they were afterwards categorized into three classes as follows. Scale score values 1–2.4 were defined as “Negative regard”, 2.5–3.4 as “Neutral regard”, 3.5–5 as “Positive regard” in terms of Attitude toward prescription medicines and Attitude toward OTC medicines. For General attitude toward medicines, Attitude toward the risks of medicines, and Attitude toward the long-term use of pain killers, scale score values 1–2.4 were defined as “Positive regard”, 2.5–3.4 as “Neutral regard”, and 3.5–5 as “Negative regard”. Consequently, positive regard actually indicates positive and negative regard indicates negative.

6.3 CLASSIFICATION OF SELF-MEDICATION

Over-the-counter medicines

OTC medicines, including registered vitamins, were coded according to their Anatomical-Therapeutic-Chemical (ATC) classification system in 2007 (National Agency for Medicines 2007). If the parent had reported the name of the product, it was coded according to the chemical substance. If the trade name of the product was not reported by the parent, the product was coded according to the closest level that was possible.

Complementary and alternative medicines

The reported CAM products were mainly classified according to the content of the product as probiotics, fish oils and fatty acids, homeopathics and other CAMs that included products for constipation and stomach function and preparations for cold, for example (Table 4). The use of non-registered vitamins was combined with registered vitamins, and reported in the results of study II.

Table 4. The classification of Complementary and alternative medicines (CAMs).

CAM product	The number of reported products	Per cent of cases
<i>Probiotics</i>	142	16.7
<i>Fish oils and fatty acids</i>	228	26.8
<i>Homeopathics</i>	48	5.6
<i>Other CAMs</i>	114	13.4
Preparations for a cold	20	2.3
Preparations for warts	7	0.8
Preparations for muscle pains	2	0.2
Other ointments	20	2.3
Xylitol preparations	7	0.8
Preparations for constipation and stomach function	4	0.5
Other*	54	6.3

*ginger preparations, preparations for dieting

6.4 STATISTICAL ANALYSIS

The data were analysed with Statistical Package for Social Sciences for Windows, Version 14.0 and 17.0 (SPSS Inc., Chicago, IL, USA). To describe the results, frequencies, percentages, Pearson's Chi-square -test (I, II, III, IV) and univariate logistic regression model (IV) were used. P-values of less than 0.05 were considered statistically significant. As a multivariate analysis, logistic regression model was used to determine factors associated with children's health and self-medication (I, III, IV). The discriminating ability of the analysis was measured by receiver operating characteristic (ROC) curve analysis in each of these studies.

6.5 ETHICS OF THE STUDY

The study setting and research process was in accordance with the local and national ethical instructions for research (National Advisory Board on Ethics: <http://www.tenk.fi/en/index.html>). No ethical approval from the ethical review board was required for a postal survey. The questionnaire was addressed to either parent of the

children and since answering the questionnaire was voluntary, returning a questionnaire was seen as an informed consent from the parent.

6.6 REPRESENTATIVENESS OF THE STUDY POPULATION

The representativeness of the respondents and non-respondents was analysed and compared with the target population (II). The analysis showed that the study sample was representative of the target population regarding age and gender of the child. Minor differences were found in the regional distribution: Southern, 40.7% (the actual proportion of the children in that area is 41.1%); Western, 32.6% (34.9%); Eastern, 12.8% (9.9%); Oulu region, 10.1% (10.4%); Lapland, 3.4% (3.3%); and Åland 0.5% (0.5%). On the other hand, analysis of the non-respondents showed no significant differences compared with the target population in terms of age, sex, or regional distribution.

7 Results

7.1 HEALTH AND THE USE OF SELF-MEDICATION AMONG CHILDREN (I, II, III)

7.1.1 Health of children (I)

The majority (97%) of children had good health status reported by their parent (I, Table 5). However, 11% of children had some long-term disease, and 66% of children had experienced some symptom. Approximately one third of the children had experienced one and one third two or more symptoms (data not shown). Psychosomatic symptoms had been experienced by 11% of children (I, Table 5).

Table 5. Self-reported health among Finnish children under 12 years of age and the prevalences of the three most common long-term diseases, reported symptoms and psychosomatic symptoms.

	Age, years			Total % (n)	p
	0–2 % (n)	3–6 % (n)	7–11 % (n)		
Health status (n=4,015)					<0.05
Good	94 (932)	98 (1,256)	98 (1,692)	97 (3,880)	
Moderate or poor	6 (65)	2 (28)	2 (42)	3 (135)	
The prevalence of long-term diseases (n=4,009)	9 (93)	10 (131)	13 (232)	11 (456)	0.002
Allergy	3 (31)	3 (42)	5 (93)	4 (166)	0.003
Asthma	2 (23)	4 (52)	4 (77)	4 (152)	0.015
Atopy	4 (39)	3 (44)	2 (34)	3 (117)	0.006
The prevalence of all reported symptoms (n=3,985)*	72 (723)	65 (824)	63 (1,085)	66 (2,632)	<0.05
Symptoms of common cold	43 (434)	37 (464)	26 (446)	34 (1,344)	<0.05
Eczema	29 (291)	25 (313)	20 (344)	24 (948)	<0.05
Flatulence	12 (115)	8 (101)	14 (238)	11 (454)	<0.05
The prevalence of psychosomatic symptoms (n=3,984)*	13 (133)	8 (97)	12 (207)	11 (437)	<0.05
Sleep disorders	10 (104)	4 (49)	4 (65)	6 (218)	<0.05
Fatigue or dizziness	5 (45)	3 (40)	7 (111)	5 (196)	<0.05
Anxiety	1 (10)	2 (24)	5 (80)	3 (114)	<0.05

*at the moment when answering the questionnaire

Good health status was most commonly reported for children aged over 2 years (98% of children aged 3–6 and 7–11 years) (I, Table 5). Children in these older age groups had also most commonly some long-term disease (10% and 13%, respectively). In contrast, the experience of symptoms was most prevalent among children under three years of age (72% of children at this age) compared to older ones. The prevalence of psychosomatic symptoms

was more common among children under three years of age (13% of children at this age) and 7- to 11-year-old children (12%) than among 3- to 6-year-old children. Child's gender was not significantly associated with any of these health variables (I).

The most common long-term diseases among children were allergy (4% of children) and asthma (4%) (I, Table 5). Having an allergy was most prevalent among children aged 7 to 11 years (5% of the children in this age group), whereas asthma was equally common among children 3 to 6 years of age and 7 to 11 years of age (4%).

Symptoms of common cold (34% of children) and eczema (24%) were the most common symptoms children had experienced at the time of answering the questionnaire (I, Table 5). Both of these symptoms were more prevalent among children under 3 years of age (43% for symptoms of cold and 29% for eczema) than among older children.

Of psychosomatic symptoms, sleep disorders (6% of children) and fatigue or dizziness (5%) were the most common symptoms children had experienced (I, Table 5). Sleep disorders had most commonly been experienced by children under three years of age (10%), whereas fatigue or dizziness were most prevalent among the oldest children (7% of 7- to 11-year-old children).

7.1.2 The use of self-medication (II, III)

In total, 50% of the children had used some self-medication, OTC medicines, vitamins, and/or CAMs (II, Table 6). One fifth of the children had used some OTC medicines (excluding vitamins) and one tenth some CAM (excluding vitamin use) (II, III, Table 6). The majority of the CAM users had used CAM in conjunction with OTC and/or prescribed medicines (7% of children), and three per cent of children had used only some CAM (III).

Table 6. The overall use of self-medication, and the proportions of users of OTC medicines and CAMs in the preceding two days among Finnish children under 12 years of age.

	Overall use of self-medication†	Proportion of OTC medicine users*	Proportion of CAM users‡
	% (n)	% (n)	% (n)
Age, years	p<0.05	p<0.05	p=0.08
0–2	73 (723)	24 (232)	12 (121)
3–6	48 (606)	16 (202)	10 (124)
7–11	39 (662)	13 (221)	12 (207)
Gender	p=0.39	p=0.51	p=0.14
Boy	49 (1028)	16 (335)	12 (251)
Girl	51 (963)	17 (320)	11 (201)
Total	50 (1,991/3,986)	17 (655/3,942)	11 (452/3,958)

†use of OTC medicines, vitamins and/or CAMs *also other types of self-medication (CAMs, vitamins) may be in use ‡also other types of self-medication (OTC medicines, vitamins) may be in use

The overall use of self-medication and the use of OTC medicines were most common among children under 3 years of age; 73% of children of this age had used some self-medication, and the figure for the use of OTC medicines in this age group was 24% (II, Table 6). No differences were seen in the use of CAMs according to different ages (II, III, Table 6). In contrast, the use of only CAMs was most common among children aged 7 to 11 years (5%), and the complementary use of CAMs among children aged under three (11%) (III). Child's gender was not significantly associated with any of these variables (II, III, Table 6).

Analgesics and antipyretics, including non-steroidal anti-inflammatory (NSAIDs) drugs were the most commonly used OTC medicines among children (7%), followed by cough and cold preparations (2% of children) (II, Table 7). Paracetamol was the most common

analgesic and antipyretic the children had used in the preceding two days (II). The use of analgesics and antipyretics, including NSAIDs, was most common among children under three years of age (9% of children of this age) (II, Table 7).

Table 7. Three most commonly used OTC medicines and CAMs among Finnish children under 12 years of age in the preceding two days.

	Age, years			Total (n=3,892*) % (n)	p
	0–2 (n=966) % (n)	3–6 (n=1,252) % (n)	7–11 (n=1,674) % (n)		
OTC medicines					
Analgesics and antipyretics, including NSAIDs	9 (91)	5 (59)	7 (109)	7 (259)	<0.05
Cough and cold medicines	2 (18)	4 (45)	2 (29)	2 (92)	0.002
Preparations for treatment of wounds and ulcers	4 (39)	2 (30)	1 (18)	2 (87)	<0.05
CAMs					
Fish oils and fatty acids	2 (15)	5 (63)	8 (135)	6 (213)	<0.05
Probiotics	8 (75)	3 (42)	1 (23)	4 (140)	<0.05
Homeopathics	1 (10)	1 (10)	1 (11)	1 (31)	0.58

*Study population consists of children that had no missing data on any of the questions of prescription medicines, OTC medicines and CAMs use

Of CAMs, the children had most commonly used fish oils and fatty acids (6%) and probiotics (4%) (II, III, Table 7). Homeopathics had been used by 1% of the children. The use of fish oils and fatty acids was most common among children aged 7 to 11 years, whereas the use of probiotics was most common among children under 3 years of age (II, Table 7).

7.2 FACTORS ASSOCIATED WITH HEALTH AND THE USE OF SELF-MEDICATION AMONG CHILDREN (I, III, IV)

7.2.1 Parental socioeconomic background (I, IV)

The association of parental socioeconomic background was explored with regard to children's health (I, Table 8) and the use of OTC medicines and CAMs (IV, Table 9). No significant association was found between parental socioeconomic background and children's health (self-rated health, the prevalence of long-term diseases or the prevalence of psychosomatic symptoms), OTC medicines or CAM use among children (I, Table 8, Table 9).

Table 8. A multivariate logistic regression analysis of factors associated with children's health (n=4032).

	Poor health status	Psychosomatic symptoms	Long-term diseases
	OR (95%CI)	OR (95%CI)	OR (95%CI)
Child's			
<i>Gender</i>	p=0.61	p=0.42	p=0.05
Girl	1.00	1.00	1.00
Boy	0.90 (0.59–1.37)	0.92 (0.74–1.14)	1.23 (1.00–1.51)
<i>Age, years</i>	p<0.05	p<0.05	p<0.05
0–2	1.00	1.00	1.00
3–6	0.35 (0.20–0.61)	0.53 (0.39–0.72)	1.22 (0.90–1.66)
7–11	0.33 (0.20–0.57)	0.93 (0.71–1.23)	1.67 (1.24–2.23)
<i>Number of long-term diseases</i>	p<0.05	p<0.05	-
0	1.00	1.00	-
1	1.48 (0.83–2.63)	1.62 (1.19–2.22)	-
≥2	5.51 (2.53–12.0)	1.62 (0.92–2.85)	-
<i>Presence of impairments*</i>	p=0.01	p<0.05	p=0.05
0	1.00	1.00	1.00
1	3.17 (1.26–7.98)	2.27 (1.31–3.95)	1.76 (1.01–3.06)
<i>Presence of other diseases*</i>	p<0.05	p<0.05	p=0.64
0	1.00	1.00	1.00
1	9.39 (5.94–14.85)	1.65 (1.16–2.33)	0.91 (0.61–1.35)
<i>Number of psychosomatic symptoms</i>	p<0.05	-	p<0.05
0	1.00	-	1.00
1	4.50 (2.78–7.27)	-	1.64 (1.20–2.25)
≥2	8.51 (4.47–16.23)	-	1.44 (0.85–2.43)
<i>Number of other symptoms*</i>	p<0.05	p<0.05	p<0.05
0	1.00	1.00	1.00
1	3.19 (1.18–8.63)	1.78 (1.29–2.47)	2.00 (1.50–2.67)
2	6.34 (2.37–16.96)	3.30 (2.35–4.64)	2.72 (1.98–3.73)
≥3	12.53 (4.81–32.66)	7.70 (5.53–10.73)	4.06 (2.93–5.64)
Parent's			
<i>Highest level of Education</i>	p=0.61	p=0.80	p=0.05
Polytechnic, college, or university degree (≥15 years)	1.00	1.00	1.00
Senior high school/vocational school (11–13 years)	1.23 (0.76–1.98)	1.07 (0.83–1.37)	0.78 (0.62–0.98)
Junior high school or less (≤9years)	0.89 (0.32–2.50)	1.16 (0.72–1.85)	0.63 (0.38–1.04)
<i>Working status</i>	p=0.27	p=0.11	p=0.28
Working	1.00	1.00	1.00
Not in work	0.77 (0.48–1.22)	1.22 (0.96–1.56)	0.88 (0.69–1.12)
<i>Monthly net income of the household in euros</i>	p=0.36	p=0.35	p=0.59
4,000–10,000	1.00	1.00	1.00
3,000–3,999	0.88 (0.38–2.06)	0.78 (0.52–1.19)	1.26 (0.85–1.86)
2,000–2,999	1.32 (0.57–3.10)	0.97(0.63–1.48)	1.12 (0.74–1.69)
≤1,999	1.42 (0.58–3.49)	0.98 (0.62–1.54)	1.25 (0.81–1.94)

*described in study I

Table 9. A multivariate logistic regression analysis of factors associated with children's use of OTC medicines and CAMs (n=4032).

	The use of OTC medicines by children OR (95%CI)	The use of CAMs by children OR (95%CI)
Child's		
<i>Gender</i>	p=0.52	p=0.16
Girl	1.00	1.00
Boy	0.94 (0.78–1.14)	1.17 (0.94–1.47)
<i>Age, years</i>	p<0.05	p=0.24
0–2	1.00	1.00
3–6	0.66 (0.51–0.86)	0.84 (0.60–1.17)
7–11	0.48 (0.36–0.63)	1.05 (0.74–1.49)
<i>Presence of doctor-diagnosed illnesses</i>	p=0.005	p=0.09
No	1.00	1.00
Yes	0.70 (0.54–0.90)	1.28 (0.96–1.71)
<i>Number of symptoms</i>	p<0.05	p<0.05
0	1.00	1.00
1	2.82 (2.07–3.83)	1.33 (0.98–1.80)
≥2	6.54 (4.84–8.84)	1.88 (1.39–2.55)
<i>Health status reported by the parent</i>	p<0.05	p=0.51
Good	1.00	1.00
Fairly good	1.87 (1.47–2.37)	1.15 (0.85–1.56)
Moderate, fairly poor or poor	2.53 (1.63–3.92)	1.30 (0.75–2.28)
<i>Number of children in the family</i>	p=0.60	p=0.02
1	1.00	1.00
2	1.02 (0.78–1.34)	0.81 (0.59–1.11)
≥3	0.91 (0.68–1.22)	0.62 (0.44–0.88)
Parent's		
<i>Prescribed medicine use</i>	p=0.41	p=0.15
No	1.00	1.00
Yes	1.09 (0.89–1.32)	0.84 (0.66–1.06)
<i>OTC medicine use</i>	p=0.02	p=0.43
No	1.00	1.00
Yes	1.27 (1.04–1.55)	1.11 (0.87–1.41)
<i>CAM use</i>	p=0.29	p<0.05
No	1.00	1.00
Yes	1.14 (0.90–1.45)	7.25 (5.75–9.13)
<i>Parental age, years</i>	p=0.13	p=0.78
≤30	1.00	1.00
31–45	1.30 (1.01–1.68)	1.09 (0.79–1.49)
≥46	1.34 (0.79–2.28)	1.21 (0.70–2.11)
<i>Highest level of education</i>	P=0.57	p=0.07
Junior high school or less (≤9years)	1.00	1.00
Senior high school/vocational school (11–13 years)	1.06 (0.70–1.62)	1.45 (0.79–2.64)
Polytechnic, college, or university degree (≥15 years)	0.95 (0.60–1.49)	1.82 (0.97–3.40)
<i>Working status</i>	p=0.72	p=0.07
Not working (including persons on sick leave, retired, or unemployed)	1.00	1.00
Working or studying	0.84 (0.54–1.30)	1.56 (0.85–2.87)
Home with children	0.86 (0.54–1.37)	1.97 (1.04–3.73)
<i>Monthly net income of the household in euros</i>	p=0.88	p=0.51
≤1,999	1.00	1.00
2,000–2,999	1.03 (0.79–1.34)	0.94 (0.68–1.31)
3,000–3,999	0.93 (0.71–1.24)	1.13 (0.81–1.57)
4,000–10,000	1.01 (0.67–1.53)	1.24 (0.77–1.98)

(Table 9. continued)

Table 9. (continued).

	The users of OTC medicines by children	The users of CAMs by children
	OR (95%CI)	OR (95%CI)
General attitude toward medicine:	p=0.19	p=0.86
Negative regard	1.00	1.00
Neutral regard	1.23 (0.91–1.67)	0.92 (0.67–1.27)
Positive regard	1.36 (0.98–1.91)	0.96 (0.66–1.38)
Attitude toward prescription medicines:	p=0.10	p<0.001
Negative regard	1.00	1.00
Neutral regard	2.68 (0.89–8.09)	0.46 (0.23–0.92)
Positive regard	3.03 (1.03–8.98)	0.24 (0.12–0.46)
Attitude toward OTC medicines:	p=0.04	p=0.02
Negative regard	1.00	1.00
Neutral regard	1.00 (0.71–1.40)	1.49 (0.97–2.30)
Positive regard	1.28 (0.93–1.78)	1.78 (1.16–2.72)
Attitude toward the risks medicines:	p=0.61	p=0.01
Negative regard	1.00	1.00
Neutral regard	1.03 (0.82–1.31)	0.82 (0.61–1.10)
Positive regard	1.20 (0.84–1.73)	0.43 (0.24–0.77)
Attitude toward the long-term use of pain-killers:	p=0.76	p=0.72
Negative regard	1.00	1.00
Neutral regard	1.03 (0.83–1.29)	1.08 (0.83–1.39)
Positive regard	0.93 (0.70–1.23)	1.14 (0.82–1.58)

7.2.2 Parental attitudes (IV)

The association of parental attitudes toward medicines and the use of OTC medicines and CAMs among children were assessed in study IV. The results are also presented in Table 9.

Of parental attitudes, only the attitude toward OTC medicines was associated with the use of OTC medicines among children ($p=0.04$) (IV, Table 9). However, no specific differences were found between the categories of parental views toward OTC medicines and in the use of OTC medicines among children.

In contrast, parental attitude toward prescription medicines, OTC medicines and the risks of medicines was significantly associated with the use of CAMs among children (IV, Table 9). Children whose parent had positive views toward prescription medicines were less likely to use CAM compared to children with parents having negative attitudes toward prescription medicines. In contrast, children whose parents had a positive regard toward OTC medicines were more likely to use CAMs compared to children with parents having negative views about OTC medicines. Worries about the risks of medicines on the part of the parent also predicted the use of CAMs among children.

7.2.3 Other factors (I, IV)

Of other factors, age was found to be associated with children's health; the probabilities for moderate or poor health status were lower among 3- to 6-year-old and 7- to 11-year-old children than among children aged 0 to 2 years, and for psychosomatic symptoms among 3- to 6-year-old children (I, Table 8). In contrast, the probability of having a long-term disease was highest among children aged 7 to 11 years. A number of different adverse health variables (e.g. number of long-term diseases, number of psychosomatic and other symptoms) were also associated with children's poor health status, psychosomatic symptoms and the prevalence of long-term diseases among children. Especially an

increasing number of long-term and other diseases, psychosomatic and other symptoms predicted poor health status of children.

Factors that were found to predict the use of OTC medicines among children were the young age of a child, child's poor health status reported by the parent, the child having one or more symptoms, and parental use of OTC medicines (IV, Table 9). If the child had some illness diagnosed by a physician, the use of OTC medicines was less likely than among children with no diseases diagnosed by a physician.

On the other hand, parental use of CAMs, illness diagnosed by a physician, and the child having one or more symptoms predicted the use of CAMs among children (IV, Table 9). In addition, if there were three or more children in the family, the use of CAMs was less likely than among children in families with one child.

7.3 SUMMARY OF THE RESULTS

The health of Finnish children was most commonly reported to be good by the parents (Figure 4). One tenth of the children had some long-term disease, and over half of them had experienced some symptom(s) currently. The prevalence of psychosomatic symptoms was 11%. Allergy and asthma were the most common long-term diseases, and symptoms of common cold and eczema the most common symptoms children had experienced at the time when answering the questionnaire. Of psychosomatic symptoms, sleep disturbances and fatigue or dizziness were most common ones experienced by the children.

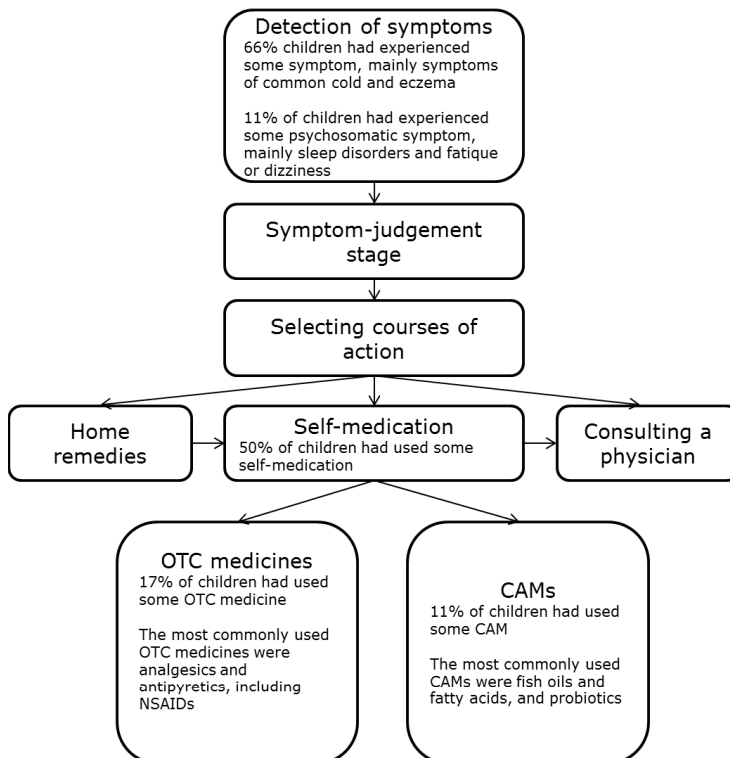


Figure 4. Results of the study applied to the self-care process among Finnish children.

In total, half of the children had used some self-medication (Figure 4). The proportion of users of OTC medicines and CAMs was 17% and 11%, respectively. The most commonly used OTC medicines among children were analgesics and antipyretics, including NSAIDs, mainly paracetamol. Fish oils and fatty acids and probiotics were the most commonly used CAM products among children.

The number of various symptoms and diseases was found especially to be associated with poor health of the child. In contrast, poor health of a child and parental own use of self-medication was associated with the use of self-medication among children (Figure 5). No significant differences were found between parental socioeconomic background and children's health or the use of self-medication. Parental attitudes toward medicines were found to be associated with the use of self-medication among children, and especially with the use of CAMs. Children whose parent had positive views toward prescription medicines were less likely to use CAMs compared to children with parents having a negative regard toward prescription medicines. In contrast, parental positive regard toward OTC medicines, and on the other hand, worries about the risks of medicines, predicted the use of CAMs among children.

Health (Self-rated health, prevalence's of long-term diseases and psychosomatic symptoms)	OTC medicines use	CAMs use
<ul style="list-style-type: none"> • Increase • Increasing number of long-term diseases, presence of impairments, other diseases, psychosomatic and other symptoms were associated with poor health status of a child and the experience of psychosomatic symptoms • Older age of a child, having one psychosomatic symptom and increasing number of other symptoms were associated with the prevalence of long-term diseases • Decrease • The prevalence of poor health status was lowest among children older than 2 years of age • The prevalence of psychosomatic symptoms was lowest among 3- to 6-year-old children • No significant association • Parental socioeconomic background 	<ul style="list-style-type: none"> • Increase: • Young age of a child • Increasing number of symptoms • Poor health status of a child • Parental use of OTC medicines • Decrease • Doctor-diagnosed illness • No significant association • Parental socioeconomic background 	<ul style="list-style-type: none"> • Increase • Increasing number of symptoms • Doctor-diagnosed illness • Parental use of CAMs • Parental worries about the risks of medicines • Parental positive attitude toward OTC medicines • Decrease • Increasing number of children in family • Parental positive attitude toward prescription medicines • No significant association • Parental socioeconomic background

Figure 5. Factor's related to children's health and the use of self-medication (OTC medicines and CAMs) according to the results of this study.

8 Discussion

8.1 CHILDREN'S HEALTH

This study showed that the general health among Finnish children is good, as has also been found in previous studies (e.g. Office for National Statistics 2002, Rimpelä et al. 2004, Emerson et al. 2006, Johnson and Wang 2008, National Institute for Health and Welfare 2012). One tenth of the children had some long-term disease. The prevalence of long-term diseases among children in Finland was significantly lower than in 1995/96, when approximately 20% of children under 15 years of age had some long-term disease (Arinen et al. 1998). However, the figures for adolescents (aged 12 to 18 years) during the years 1980 and 2007 were similar as in this study, approximately 10% (Rimpelä et al. 2004, Luopa et al. 2008).

There are some differences in the measurement of long-term disease compared to previous studies from Finland and some studies abroad, which may explain the difference in the results. The prevalence of long-term diseases was measured according to the child's current diseases diagnosed by a doctor, and the classification was made by the research group. In the previous study from Finland, the prevalence of long-term diseases was measured by asking a parent to report whether the child had some injury or current long-term disease affecting his/her daily life (Arinen et al. 1998). The question was similar as was used for adolescents (Rimpelä et al. 2004, Luopa et al. 2008). Despite this similarity, the prevalences of long-term disease differed among children under 12 years of age and adolescents (Arinen et al. 1998, Rimpelä et al. 2004). In addition, some other previous studies from abroad have measured the prevalence of long-term diseases, for example, as an illness or disability that has lasted at least three months during the past year (Halldórsson et al. 2000, Berntsson and Köhler 2001, Reinhardt Pedersen and Madsen 2002). Thus, these previous studies may also include different disabilities, which were not included in our definition, but exclude newly diagnosed long-term diseases, which could be reported in our study. However, in spite of this difference in the methods used the results that allergy and eczema were the most common long-term diseases among children were consistent with previous findings (Arinen et al. 1998, Takala et al. 2001, Victorino et al. 2009).

The majority (66%) of the children had currently, i.e. at the moment when answering the questionnaire, experienced some symptom(s), mostly symptoms of common cold and eczema. Psychosomatic symptoms had been experienced by 11% of the children. Our results were not in accordance with the previous findings that the prevalences of psychosomatic symptoms increase with age (Halldórsson et al. 2000, Haugland et al. 2001, Reinhardt Pedersen and Madsen 2002, Petersen et al. 2003, Emerson et al. 2006, Ishida et al. 2012). In our study, sleep disorders were the most common symptoms the children had experienced, especially among children under three years. In many previous studies that have included sleep disorders as psychosomatic symptoms, only children aged two years and/or over have been included in the study population (Halldórsson et al. 2000, Berntsson and Köhler 2001, Haugland et al. 2001, Reinhardt Pedersen and Madsen 2002, West and Sweeting 2004). In addition, the definitions of psychosomatic symptoms also vary between different studies. Some of the studies have included different pains, such as stomach ache and headache, as psychosomatic symptoms (Halldórsson et al. 2000, Berntsson and Köhler 2001, Reinhardt Pedersen and Madsen 2002), which tend to be more common among older children and

adolescents (Halldórsson et al. 2000, Haugland et al. 2001, Reinhardt Pedersen and Madsen 2002, Petersen et al. 2003, Emerson et al. 2006, Uijen et al. 2008). In this study, symptoms of pains were not regarded as psychosomatic symptoms.

8.1.1 Factors associated with children's health

The results indicated that adverse health variables have a cumulative effect on children's health. Children who had poor health status reported by their parent, some long-term disease or had experienced of some psychosomatic symptoms, also had some other health burden currently, such as other symptoms, diseases and/or impairments.

In contrast, parental socioeconomic factors were not found to be associated with children's health in this study. This was in contrast to previous findings of parental socioeconomic background being a predictive factor especially for poor health in children (e.g. Halldórsson et al. 2000, West and Sweeting 2004, Bauman et al. 2006, Chen et al. 2006a, Currie and Lin 2007, Johnson and Wang 2008, Victorino and Gauthier 2009). In an older Finnish study, a slight significant association was seen between mother's education and children's health in 1996; children with lower educated mothers had fewer diseases than children with higher educated mothers (Takala et al. 2001). This was seen also in the case of asthma and allergies. It was speculated that a child with a higher educated mother may possibly be taken earlier to see a physician than a child with a lower educated mother. Having private insurance also increased the possibility for some diseases, especially asthma and allergy (Takala et al. 2001). A private insurance might make it easier to contact medical services (Duderstadt et al. 2006), and families with higher educated parents may have better possibilities to acquire insurance for their child. In this study, we do not know whether or not the child was covered by private insurance.

It is difficult to estimate the main reasons for the differences in the results of present and previous studies. Reasons may possibly be found from the definition of socioeconomic background, age of the study population and/or socioeconomic background of the parents. Education level and/or income have been widely used indicators of socioeconomic status also in previous studies (e.g. Halldórsson et al. 2000, Berntsson and Köhler 2001, Bauman et al. 2006, Chen et al. 2006b, von Rueden et al. 2006, Larson et al. 2008, Victorino and Gauthier 2009), of which the classification of education level, especially, is mainly comparable with these previous studies (e.g. Halldórsson et al. 2000, Berntsson and Köhler 2001, Bauman et al. 2006, Victorino and Gauthier 2009). However, there were some differences in the age of the study populations. Most of the previous studies have also included adolescents, children aged under 18 years, as one homogenous group in their study population (e.g. Berntsson and Köhler 2001, Bauman et al. 2006, Chen et al. 2006a, Larson et al. 2008, Victorino and Gauthier 2009), which may indicate that parental socioeconomic background is a more predictive factor for children's health in adolescence than in childhood.

The parents in our study were quite well educated, which may be one reason for the distinction in the results. When comparing the education level of the respondents (mothers) to the education level of all women in Finland, it may be seen that the respondents in our study were slightly more highly educated than women over 14 years of age on average in 2007 (Statistics Finland 2012). Around one third (32%) of the respondents had a polytechnic, college or university degree (≥ 15 years), whereas the proportion of women with some tertiary education was 29% in 2007 (and 26% among all citizens). In addition, it has also been explored previously that non-respondents are usually people with low socioeconomic background (Halldórsson et al. 2002, Tolonen 2005, Slone Epidemiology Center 2006, Trajanovska et al. 2010b). However, the socioeconomic status of non-respondents could not be identified in this study.

Even though no differences were seen between parental socioeconomic background and childhood health variables in this study, socioeconomic differences in health can also be observed in Finland, despite the fact that the overall health of people has improved during the last decades (Arinen et al. 1998, Palosuo et al. 2007, Lahelma et al. 2007, Ministry of Social Affairs and Health 2012). Socioeconomic differences in health have increased especially in mortality during the last decades (Palosuo et al. 2007), also among children (Remes 2012). Minimizing health inequalities between different population groups has also been one of the objectives for health policy in Finland since 1986 (Ministry of Social Affairs and Health 2001, Palosuo et al. 2007, Ministry of Social Affairs and Health 2012).

8.2 THE USE OF SELF-MEDICATION

The results of this study highlighted that the role of self-medication in self-care among children has increased in Finland during the last decade (Arinen et al. 1998, Figure 6). The results also indicate that parents are more aware of using self-medication as symptom treatment, but also as a preventive measure and to maintain good health.

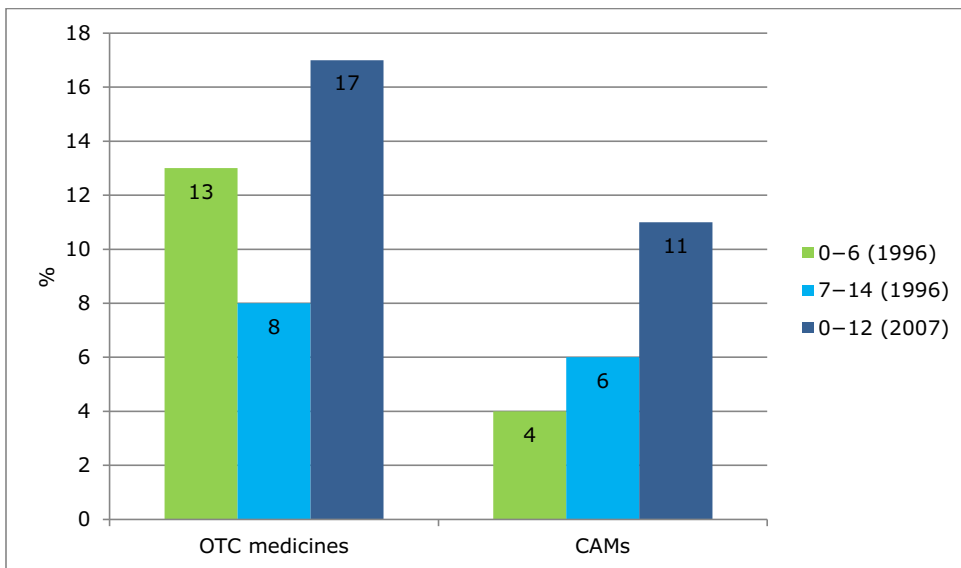


Figure 6. The prevalences of OTC medicine and CAM use in the preceding two days among children in Finland in 1996 (children aged 0–6 and 7–14 years) and in 2007 (children aged 0–12 years) (Arinen et al. 1998).

A slight increase in the use of self-medication, especially analgesics use, has also been shown in Spain among children under 16 years of age (Carrasco-Garrido et al. 2009). The trend in CAM use has not been explored in previous studies among children abroad, but an increasing trend in CAM use has also been seen among adults in the USA and Italy, for example (Eisenberg et al. 1998, Menniti-Ippolito et al. 2002, Su and Li 2011).

A reason for the increased use of self-medication might be the increased availability of OTC medicines and CAMs (WHO 1998, WHO 2000). Increased education level among

citizens may also be one reason for the use (WHO 1998). People with higher education may have more interest in taking care of their own health, have better knowledge of medicines, and it has also been indicated that higher educated people have better health literacy than people with lower education (Calamusa et al. 2012). In addition, the use of different sources of information, such as health care professionals, books and package information leaflets has been found to be more common among parents with high education than among lower educated parents (grades 11 and over) (Jensen et al. 2010, Calamusa et al. 2012, Holappa et al. 2012).

The current medicines policy of the Ministry of Social Affairs and Health in Finland (2011) states that the good availability of medicines should be kept in Finland in the future. One of the basics for this aim has been the extensive pharmacy network and its quality that covers the whole of Finland (Ministry of Social Affairs and Health in Finland 2011, Suomen Apteekkariliitto 2012, Suomen Apteekkariliitto 2013). Other aims expressed in the current medicines policy are to increase the status of self-medication and to increase the active role of consumers in their own self-care (Ministry of Social Affairs and Health 2011). On the other hand, pharmaceutical industry has proposed that more medicines should be switched from prescription status to OTC medicine status (Lääketeollisuus ry 2010, Lääketeollisuus ry 2012, Association of the European self-medication industry (AESGP) 2013). Furthermore, The Finnish Grocery Trade Association has advocated that a restricted selection of some OTC medicines, e.g., analgesics and cough and cold medicines, should be available for consumers via grocery stores, as has been done in countries such as Norway, Denmark and Sweden (Anell 2005, Mankinen and Rantala 2009). Thus, the role of self-medication is under debate at the moment, but all quarters agree that the role of patients will increase.

8.2.1 Factors associated with the use of self-medication

Parental socioeconomic background

No significant differences were found between parental socioeconomic background and children's self-medication. Previously, the use of OTC medicines and CAMs had been found to be more common among children with a highly educated parent (e.g. Kogan et al. 1994, Ecklund and Ross 2001, Tobi et al. 2003, Crawford et al. 2006, Smith and Eckert 2006, Du and Knopf 2009b, Zuzak et al. 2009, Birdee et al. 2010). One reason for this distinction may be in the definition of OTC medicine and especially of CAM. Most of the previous studies have also included CAM therapies, such as acupuncture and chiropractic treatment, in their definition, which were excluded from our study (e.g. Menniti-Ippolito et al. 2002, Zuzak et al. 2009, Birdee et al. 2010).

Parental attitudes

The results showed that parental attitudes are related to the use of self-medication for their child. Worries about the adverse events, e.g. interactions of medicines were found to predict the use of CAMs among children. It has also been found in some previous studies that parents typically perceive CAMs as natural and safe (Crawford et al. 2006, Hoa et al. 2007, Jean and Cyr 2007, Nichol et al. 2011, Wadhwa et al. 2011), and the fear of side-effects of conventional medicines, for example, has been one of the reasons for giving CAMs to children (Simpson and Roman 2001). If the parent felt the use of prescription medicines to be safe, the use of CAMs among children was less likely. CAM use among children was also more likely if the parent felt confident about using OTC medicines. Reasons for this result may be that the distinction between CAMs and OTC medicines may sometimes be unclear to parents (Furnham 2002) since most of the CAM products children had used are also sold

in pharmacies in Finland. Some of the CAMs used may also have been recommended by health care professionals, such as probiotics, which may be used for the treatment of infantile colic, for example (Savino et al 2007). These parents with a positive attitude toward OTC medicines may also be positively oriented toward self-medication overall.

Even though a significant association between parental attitudes and the use of self-medication was found, the results indicated that other factors, especially the experience of symptoms and parental use of self-medication, are more predictive factors for the use of self-medication among children than attitudes themselves.

8.3 SAFE USE OF SELF-MEDICATION

One aim of the current medicines policy of the Ministry of Social Affairs and Health in Finland (2011) is to increase availability of reliable sources of information about medicines for health care professionals and consumers and to ensure the safe use of medicines. This may be done by developing tools for safe use of self-medication with support from the health care professionals (Ministry of Social Affairs and Health 2011). One tool is to develop reliable sources of information about medicines for consumers and to improve the health literacy of the general public (Fimea 2012). Consumers' possibility to gain reliable information about medicines would increase by improving the understandability of package information leaflets and gathering reliable links of the sources of information about medicines on the Internet.

Earlier studies indicate that the improvement of information sources concerning self-medication is needed, not only for OTC medicines, but for CAMs as well. Research shows that therapeutic errors do sometimes happen when medicines are administered for children at home (McD Taylor et al. 2009). Usual errors are connected with the dose, such as giving double the dose that has been recommended. However, in this study, the doses of OTC medicines or CAMs administered at home for children were not studied.

Parents were found to feel safe in using CAMs for their child in this study and earlier, and to sometimes use them especially if they are worried about the adverse effects of conventional medicines (e.g. Simpson and Roman 2001, Menniti-Ippolito et al. 2002). In addition, according to a qualitative study, parents that had given CAM to their child had less knowledge about the possible harmful effects of CAM than the non-users of CAM (Araz and Bulbul 2011). It has also been found in this study and previously that the use of CAMs besides conventional care is quite common (Shaw et al. 2006, Laengler et al. 2008, Du and Knopf 2009b, Wood and Finlay 2011). This may increase the risk for interactions. In addition, parents do not always tell their child's physician of the use of CAMs. According to different studies, approximately 33 to 53 per cent of the responding parents had reported CAM use to their child's physician (Simpson and Roman 2001, Cincotta et al. 2006, Jean and Cyr 2007, Low et al. 2008, Zuzak et al. 2009, Huillet et al. 2011).

The safe use of self-medication should be discussed with parents by health care professionals. As stated in the current medicines policy, attention should also be paid to the use of non-medicinal treatments, such as CAMs (Ministry of Social Affairs and Health in Finland 2011). Health care professionals should find out if CAMs are used in conjunction with conventional medicines. Information should be given to parents that also CAMs may have some risks. By giving reliable information to parents about self-medication it could also be possible to affect their attitudes toward self-medication and to avoid risks that may occur with complementary use of medicines and CAMs.

8.4 METHODOLOGICAL CONSIDERATIONS

Questionnaire as a survey method was selected since it is an easy and rapid way to gain representative information about a large population that cannot be obtained from registers, for example (Turunen 2008). The response rate in this study was 67%, which may be considered as good for a questionnaire survey (Tolonen 2005). Such high response rates varying 61% to 92% have also been obtained in other studies concerning self-medication among children (e.g. Arinen et al. 1998, Madsen et al. 2003, Smith and Eckert 2006, Barnes et al. 2008, Du and Knopf 2009a, Vernacchio et al. 2009, Zuzak et al. 2010), which indicates parental interest in this subject. The analysis of the representativeness showed the study population to be representative of the target population according to age and gender. Minor differences were seen in the regional distribution of children.

Despite the good response rate gained, there might be differences in health and the use of self-medication between the respondents and non-respondents. Since the non-respondents have usually lower socioeconomic background than the respondents (Halldórsson et al. 2002, Tolonen 2005, Slone Epidemiology Center 2006, Trajanovska et al. 2010b), it is possible that these children have also worse health status and more medicines in use than the respondents. In addition, since the socioeconomic differences are increasing in Finland it is apparent that also the differences in health will increase. Via maternity clinics, for example, it could be possible to explore the differences in health and in the medicine use of children with different socioeconomic backgrounds, since they are served all families free of charge.

The health measures described the children's health status, long-term diseases and the experience of symptoms. Since the current health of the children was identified, the questions were not very vulnerable to recall bias. The proportions of parents that answered these questions were high, with only 0.4% missing cases for self-rated health, 0.6% for long-term diseases, and 1.2% for symptoms experience. As mentioned previously, self-rated health is a valid and well-comparable question used in many studies (e.g. Office for National Statistics 2002, Rimpelä et al. 2004, Emerson et al. 2006, Johnson and Wang 2008, National Institute for Health and Welfare 2012). To obtain more comparable results particularly about the prevalence of long-term diseases the question could have been formulated in a similar way as in the earlier Finnish studies (Arinen et al. 1998, Rimpelä et al. 2004). It would also have been possible to ask the parent to report if the child has a reimbursement number for some long-term disease(s) by the Social Insurance Institution. If medicine use for long-term diseases were the focus of research then the sample should have been taken from children having specific long-term diseases. However, the aim of this study was to explore the use of medicines among children in general. The question of long-term diseases was open-ended, but for the symptoms experience, a list of symptoms was given with the possibility to report also other symptoms not mentioned in the list. Such a list may give a higher proportion of children that were having some symptoms currently since it helps parents to report also symptoms that may not be very severe in nature.

The main outcome measures of the use of self-medication were chosen based on the last population-based surveys in Finland in order to obtain comparable results and to minimize recall bias (Klaukka et al. 1990, Arinen et al. 1998). The proportions of missing cases were low for the questions of self-medication, 2.2% for OTC medicines use and 1.8% for CAMs use. The questionnaire was addressed to the parent who mainly takes care of the child's medication; the mother was typically the one who answered the questionnaire. It cannot be known if there is a proportion of children who have taken self-medication by themselves.

The reported OTC medicines (including registered vitamins) were coded according to ATC codes, but there was no official classification that could have been used for the CAMs reported. CAMs were coded mainly based on their content (e.g. probiotics, fish oils and fatty acids), but some CAMs were classified according to their purpose of use (e.g. products for constipation and stomach function). Products that could have been used for several purposes were difficult to classify. However, since the prevalences of most of the CAMs classified were quite low, they were combined under the class "other CAMs" in the final analysis. The most common classes, fish oils and fatty acids, and probiotics, were analysed as their own groups. Homeopathics were also selected as their own group for the analysis so that a cultural comparison of the use could be considered with other studies abroad.

The results were also analysed by using multivariate logistic regression model, adjusted with confounding factors, which increase the reliability of the results. The discriminating ability of the logistic regression models were also reassured in the studies I, III and IV with receiver operating characteristic (ROC) curve analysis which showed the discriminating ability of the models to be mainly good for different variables.

This survey may be considered to have been successful with regard to response rate, valid measurements that were used and the low proportions of missing cases in single questions. The results can be considered as representative, with regard to age and gender, of children under 12 years of age in Finland.

9 Conclusions

1. The overall health among Finnish children is good. Over half of the children had experienced some symptom(s), mainly of common cold and eczema. One tenth had some long-term disease or had experienced some psychosomatic symptom. Allergy and asthma were the most common long-term diseases, while sleep disturbances and fatigue or dizziness were the most common psychosomatic symptoms.
2. Half of the children had used some self-medication; approximately one fifth of the children had used some OTC medicine and one tenth some CAM. Analgesics and antipyretics, including NSAIDs, especially paracetamol, were the most common OTC medicines, and fish oils and probiotics the most common CAMs used.
3. Parental socioeconomic background was not associated with health or the use of self-medication among Finnish children.
4. Parental attitudes have an impact on the use of self-medication among children, especially CAM use. Parents who were worried about the risks of medicines were more likely to medicate their child with CAMs.

9.1 SUGGESTIONS FOR FURTHER STUDIES

Based on this study, the following suggestions for further studies can be made:

1. Up-to-date information should be obtained about the self-care process among children: detection of symptoms, evaluation of symptoms and the action applied for the treatment of symptoms.
2. It should be explored how parents perceive the use of OTC medicines compared to CAMs in treating children's self-limiting conditions.
3. It should be identified how parents administer OTC medicines and/or CAMs when treating their child's symptoms.
4. Further studies are needed about parental socioeconomic background with regard to children's health and the use of medicines at different ages.

10 References

Ahonen R: Self-care medicines – savings for health care. In: *Medicines and Health 2008*. pp. 141–145. Eds. Pharmaceutical Information Centre Ltd, Helsinki 2008

Ahonen R, Kalpio O, Vaskilampi T, Hallia O: Self-medication among families with children in Jyväskylä, Finland. In: *Children, Medicines, and Culture*. pp. 275–288. Eds. Bush PJ, Trakas DJ, Sanz EJ, Wirsing RL, Vaskilampi T, Prout A. Pharmaceutical Products Press, New York 1996

Allotey P, Reidpath DD, Elisha D: “Social medication” and the control of children: A qualitative study of over-the-counter medication among Australian children. *Pediatrics* 114(3):e378-e383, 2004

Anell A: Deregulating the pharmacy market: the case of Iceland and Norway. *Health Policy* 75(1):9–17, 2005

Aoyama I, Koyama S, Hibino H: Self-medication behaviors among Japanese consumers: sex, age, and SES differences and caregivers’ attitudes toward their children’s health management. *Asia Pac Fam Med* 11(1):7, 2012 doi: 10.1186/1447-056X-11-7

Aramburuzabala P, García M, Almarsdottir A, Sanz E, Polaino-Lorente A: Decision makers in the treatment of childhood illness in Madrid, Tenerife, and Chapel Hill. In: *Children, Medicines, and Culture*. pp. 155–168. Eds. Bush PJ, Trakas DJ, Sanz EJ, Wirsing RL, Vaskilampi T, Prout A. Pharmaceutical Products Press, New York 1996

Araz N, Bulbul S: Use of complementary and alternative medicine in a pediatric population in southern Turkey. *Clin Invest Med* 34(1):E21–E29, 2011

Arinen S, Häkkinen U, Klaukka T et al.: Health and the use of health services in Finland: main findings of the Finnish Health Care Survey 1995/96 and changes from 1987. *Stakes and Kela, SVT Health Care*, Helsinki 1998

Association of the European self-medication industry (AESGP): *Smart Regulation 2015*. The future regulation of self-care (accessed 11.10.2013). Available at: <http://www.aesgp.eu/self-care/smart-regulation-2015/>

Barnes PM, Bloom B, Nahin RL: Complementary and alternative medicine use among adults and children: United States, 2007. *Natl Health Stat Report* (12):1–23, 2008

Bauman LJ, Silver EJ, Stein RE: Cumulative social disadvantage and child health. *Pediatrics* 117(4):1321–1328, 2006

Berntsson LT, Köhler L: Long-term illness and psychosomatic complaints in children aged 2–17 years in the five Nordic countries. Comparison between 1984 and 1996. *Eur J Public Health* 11(1):35–42, 2001

- Birchley N, Conroy S: Parental management of over-the-counter medicines. *Pediatr Nurs* 14(9):24–28, 2002
- Birdee GS, Phillips RS, Davis RB, Gardiner P: Factors Associated With Pediatric Use of Complementary and Alternative Medicine. *Pediatrics* 125(2):249–256, 2010
- Bradley CP, Riaz A, Tobias RS, Kenkre JE, Dassu DY: Patient attitudes to over-the-counter drugs and possible professional responses to self-medication. *Fam Pract* 15(1):44–50, 1998
- Bruijnzeels MA, Foets M, van der Wouden JC, van den Heuvel WJA, Prins A: Everyday symptoms in childhood: occurrence and general practitioner consultation rates. *Br J Gen Pract* 48(426):880–884, 1998
- Bush PJ, Trakas DJ, Sanz EJ, Wirsing RL, Vaskilampi T, Prout A: *Children, Medicines, and Culture*. Pharmaceutical Products Press, New York 1996
- Calamusa A, Di Marzio A, Cristofani R et al.: Factors that influence Italian consumers' understanding of over-the-counter medicines and risk perception. *Patient Educ Couns* 87(3):395–401, 2012
- Cantarero-Arévalo L, Holstein BE, Andersen A, Kaae S, Nørredam M, Hansen EH: Inequalities in asthma treatment among children by country of birth and ancestry: a nationwide study in Denmark. *J Epidemiol Community Health* 67(11):912–917, 2013
- Cantarero-Arévalo L, Ersbøll AK, Holstein BE, Andersen A, Kaae S, Hansen EH: Ethnic and migrant differences in the use of anti-asthmatic medication for children: the effect of place and residence. *Pharmacoepidemiol Drug Saf* 23(1):95–104, 2014
- Cantrill JA, Johannesson B, Nicolson M, Noyce PR: Management of minor ailments in primary schoolchildren in rural and urban areas. *Child Care Health Dev* 22(3):167–174, 1996
- Carrasco-Garrido P, Jiménez-García R, Barrera VH, de Andrés AL, de Miguel AG: Medication consumption in the Spanish paediatric population: related factors and time trend, 1993–2003. *Br J Clin Pharmacol* 68(3):455–461, 2009
- Chen E, Martin AD, Matthews KA: Understanding Health Disparities: The Role of Race and Socioeconomic Status in Children's Health. *Am J Public Health* 96(4):702–708, 2006a
- Chen E, Martin AD, Matthews KA: Socioeconomic status and health: do gradients differ within childhood and adolescence? *Soc Sci Med* 62(9):2161–2170, 2006b
- Cincotta DR, Crawford NW, Lim A et al.: Comparison of complementary and alternative medicine use: reasons and motivations between two tertiary children's hospitals. *Arch Dis Child* 91(2):153–158, 2006
- Crawford NW, Cincotta DR, Lim A, Powell CV: A cross-sectional survey of complementary and alternative medicine use by children and adolescents attending the University Hospital of Wales. *BMC Complement Altern Med* 6:16, 2006

Currie J, Lin W: Chipping Away At Health: more on the relationship between income and child health. *Health Aff (Millwood)* 26(2):331–344, 2007

Currie A, Shields MA, Price SW: The child health/family income gradient: Evidence from England. *J Health Econ* 26(2):213–232, 2007

Del Rio MC, Prada C, Alvarez FJ: The use of medication by the Spanish population. *Pharmacoepidemiol Drug Saf* 6(1):41–48, 1997

Du Y, Knopf H: Self-medication among children and adolescents in Germany: results of the National Health Survey for Children and Adolescents (KiGGS). *Br J Clin Pharmacol* 68(4):599–608, 2009a

Du Y, Knopf H: Paediatric homoeopathy in Germany: results of the German Health Interview and Examination Survey for Children and Adolescents (KiGGS). *Pharmacoepidemiol Drug Saf* 18(5):370–379, 2009b

Duderstadt KG, Hughes DC, Soobader MJ, Newacheck PW: The impact of public insurance expansions on children's access and use of care. *Pediatrics* 118(4):1676–1682, 2006

Ecklund CR, Ross MC: Over-the-counter medication use in preschool children. *J Pediatr Health Care* 15(4):168–172, 2001

Eisenberg DM, Davis RB, Ettner SL et al.: Trends in alternative medicine use in the United States, 1990–1997: results of a follow-up national survey. *JAMA* 280(18):1569–1575, 1998

Emerson E, Graham H, Hatton C: Household income and health status in children and adolescents in Britain. *Eur J Public Health* 16(4):354–360, 2006

Erkek N, Senel S, Sahin M, Ozgur O, Karacan C: Parents' perspectives to childhood fever: comparison of culturally diverse populations. *J Paediatr Child Health* 46(10):583–587, 2010

European Commission: A guideline on changing the classification for the supply of a medicinal product for human use. European Commission 1.2006 (accessed 11.10.2013). Available at: http://ec.europa.eu/health/files/eudralex/vol-2/c/switchguide_160106_en.pdf

European Medicines Agency: Medicines for children 2013 (accessed 26.9.2013). Available at: http://www.ema.europa.eu/ema/index.jsp?curl=pages/special_topics/general/general_content_000302.jsp&mid=WC0b01ac058002d4ea

Finnish Food Safety Authority (Elintarviketurvallisuusvirasto, Evira): Ravintolisäopas elintarvikevalvojille ja elintarvikealan toimijoille. Eviran ohje 17012/4, Tuoteturvallisuusyksikkö, 08/2011

Finnish Food Safety Authority (Elintarviketurvallisuusvirasto, Evira): Ravintolisät 8.4.2013 (accessed 16.9.2013). Available at: http://www.evira.fi/portal/fi/elintarvikkeet/valmistus_ja_myynti/ravintolisat/

Finnish Medicines Agency, Social Insurance Institution: Finnish Statistics on Medicines 2012. Helsinki 2013

Finnish Medicines Agency (Fimea): Tiedolla järkevään lääkkeiden käyttöön. Lääkeinformaatiotoiminnan nykytila ja strategia vuoteen 2020. Fimea kehittää, arvioi ja informoi -julkaisusarja 1/2012, Lääkealan turvallisuus- ja kehittämiskeskus Fimea, 2012

Finnish Medicines Agency (Fimea): Herbal medicinal products 2013 (accessed 12.9.2013). Available at: http://www.fimea.fi/laakealan_toimijat/rohdosvalmisteet

Friend-du Preez N, Cameron N, Griffiths P: "So they believe that if baby is sick you must give drugs..." The importance of medicines in health-seeking behavior for childhood illnesses in urban South Africa. *Soc Sci Med* 92:43–52, 2013

Furnham A. Exploring attitudes toward, and knowledge of, homeopathy and CAM through focus groups. *Complement Ther Nurs Midwifery* 8(1):42–47, 2002

Geissler PW, Nokes K, Prince RJ, Odhiambo RA, Aagaard-Hansen J, Ouma JH: Children and medicines: self-treatment of common illnesses among Luo schoolchildren in western Kenya. *Soc Sci Med* 50(12):1771–1783, 2000

Gerrits T, Haaijer-Ruskamp F, Hardon A: "Preferably Half a Tablet": Health-seeking behavior when Dutch children get ill. In: *Children, Medicines, and Culture*. pp. 209–224. Eds. Bush PJ, Trakas DJ, Sanz EJ, Wirsing RL, Vaskilampi T, Prout A. Pharmaceutical Products Press, New York 1996

Gomez-Martinez R, Tlacuilo-Parra A, Garibaldi-Covarrubias R: Use of complementary and alternative medicine in children with cancer in Occidental, Mexico. *Pediatr Blood Cancer* 49(6):820–823, 2007

Gottschling S, Gronwald B, Schmitt S et al.: Use of complementary and alternative medicine in healthy children and children with chronic medical conditions in Germany. *Complement Ther Med* 21:S61–69, 2013

Halldórsson M, Kunst AE, Köhler L, Mackenbach JP: Socioeconomic inequalities in the health of children and adolescents. A comparative study of the five Nordic countries. *Eur J Public Health* 10(4):281–288, 2000

Halldórsson M, Kunst AE, Köhler L, Mackenbach JP: Socioeconomic differences in children's use of physician services in the Nordic countries. *J Epidemiol Community Health* 56(3):200–204, 2002

Hanssen B, Grimsgaard S, Launsø L, Fønnebø V, Falkenberg T, Rasmussen NK: Use of complementary and alternative medicine in the Scandinavian countries. *Scand J Prim Health Care* 23(1):57–62, 2005

Haugland S, Wold B, Stevenson J, Aaroe LE, Woynarowska B: Subjective health complaints in adolescence. A cross-national comparison of prevalence and dimensionality. *Eur J Public Health* 11(1):4–10, 2001

Hay AD, Heron J, Ness A; ALSPAC study team: The prevalence of symptoms and consultations in pre-school children in the Avon Longitudinal Study of Parents and Children (ALSPAC): a prospective cohort study. *Fam Pract* 22(4):367–374, 2005

Hoa NQ, Ohman A, Lundborg CS, Chuc NT: Drug use and health-seeking behavior for childhood illness in Vietnam—A qualitative study. *Health Policy* 82(3):320–329, 2007

Holappa M, Ahonen R, Vainio K, Hämeen-Anttila K: Information sources used by parents to learn about medications they are giving their children. *Res Social Adm Pharm* 8(6):579–584, 2012

Holme CO: Incidence and prevalence of non-specific symptoms and behavioural changes in infants under the age of two years. *Br J Gen Pract* 45(391):65–69, 1995

Holstein BE, Holme Hansen E, Due P, Birna Almarsdóttir A: Self-reported medicine use among 11- to 15-year-old girls and boys in Denmark 1988–1998. *Scand J Public Health* 31(5):334–341, 2003

Holstein BE, Hansen EH, Due P: Social class variation in medicine use among adolescents. *Eur J Public Health* 14(1):49–52, 2004

Huillet A, Erdie-Lalena C, Norvell D, Davis BE: Complementary and alternative medicine used by children in military pediatric clinics. *J Altern and Complement Med* 17(6):531–537, 2011

Hämeen-Anttila K, Halonen P, Siponen S, Holappa M, Ahonen R: Parental attitudes toward medicine use in children in Finland. *Int J Clin Pharm* 33(5):849–858, 2011

International Conference on Harmonization (ICH): ICH Harmonized Tripartite Guideline: Clinical investigation of medicinal products in the pediatric population E11 20.7.2000 (accessed 26.11.2013). Available at: http://www.ich.org/fileadmin/Public_Web_Site/ICH_Products/Guidelines/Efficacy/E11/Step4/E11_Guideline.pdf

Irvine S, Cunningham-Burley S: Mothers' concepts of normality, behavioural change and illness in their children. *Br J Gen Pract* 41(350):371–374, 1991

Ishida Y, Ohde S, Takahashi O et al.: Factors affecting health care utilization for children in Japan. *Pediatrics* 129(1):e113–e119, 2012

Italia S, Batscheider A, Heinrich J et al.: Utilization and costs of conventional and alternative pharmaceuticals in children: results from the German GINIplus and LISAplus birth cohort studies. *Pharmacoepidemiol Drug Saf* 21(10):1102–1111, 2012

Jean D, Cyr C: Use of complementary and alternative medicine in a general pediatric clinic. *Pediatrics* 120(1):e138–e141, 2007

Jensen JF, Tønnesen LL, Söderström M, Thorsen H, Siersma V: Paracetamol for feverish children: parental motives and experiences. *Scand J Prim Health Care* 28(2):115–120, 2010

Johnson SB, Wang C: Why do adolescents say they are less healthy than their parents think they are? The importance of mental health varies by social class in a nationally representative sample. *Pediatrics* 121(2):e307–e313, 2008

Kankkunen PM, Vehviläinen-Julkunen KM, Pietilä AM et al.: A tale of two countries: comparison of the perceptions of analgesics among Finnish and American parents. *Pain Manag Nurs* 9(3):113–119, 2008

Klaukka T, Martikainen J, Kalimo E: *Drug Utilization in Finland 1964–1987. Publications of the Social Insurance Institution, Helsinki 1990*

Kogan MD, Pappas G, Yu SM, Kotelchuck M: Over-the-counter medication use among US preschool-age children. *JAMA* 272(13):1025–1030, 1994

Laengler A, Spix C, Seifert G, Gottschling S, Graf N, Kaatsch P: Complementary and alternative treatment methods in children with cancer: A population-based retrospective survey on the prevalence of use in Germany. *Eur J Cancer* 44(15):2233–2240, 2008

Lagerløv P, Helseth S, Holager T: Childhood illnesses and the use of paracetamol (acetaminophen): a qualitative study of parents' management of common childhood illnesses. *Fam Pract* 20(6):717–723, 2003

Lahelma E, Rahkonen O, Koskinen S, Martelin T, Palosuo H: Sosioekonomisten terveyserojen syyt ja selitysmallit. In: *Terveyden eriarvoisuus Suomessa. Sosioekonomisten terveyserojen muutokset 1980–2005. Sosiaali- ja terveysministeriön julkaisuja 2007:23, Sosiaali- ja terveysministeriö, Helsinki 2007*

Larson K, Russ SA, Crall JJ, Halfon N: Influence of multiple social risks on children's health. *Pediatrics* 121(2):337–344, 2008

Lilja J, Salek, Alvarez A, Hamilton D: Patient's attitudes and behavior. In: *Pharmaceutical systems. Global perspectives.* pp. 277–299. Eds. Lilja J, Salek, Alvarez A, Hamilton D, Wiley 2008

Lim A, Cranswick N, Skull S, South M: Survey of complementary and alternative medicine use at a tertiary children's hospital. *J Paediatr Child Health* 41(8):424–427, 2005

Loman DG: The use of complementary and alternative health care practices among children. *J Pediatr Health Care* 17(2):58–63, 2003

Low E, Murray DM, O'Mahony O, O'B Hourihane J: Complementary and alternative medicine use in Irish paediatric patients. *Ir J Med Sci* 177:147–150, 2008

Luopa P, Pietikäinen M, Jokela J: *Kouluterveyskysely 1998–2007: Nuorten hyvinvoinnin kehitys ja alueelliset erot. Stakes, raportteja 23/2008, Sosiaali- ja terveysalan tutkimus- ja kehittämiskeskus, Helsinki 2008*

Lääketeollisuus ry: *Itsehoitolääkkeitä potilaan ja yhteiskunnan hyväksi. Lääketeollisuus ry, Helsinki 2010*

Lääketeollisuus ry: *Itsehoitolääkinnän taloudelliset vaikutukset ja itsehoidon institutionaalinen toimintaympäristö. Loppuraportti 5.3.2012. Lääketeollisuus ry, Helsinki 2012*

Madsen H, Andersen S, Nielsen RG, Dolmer BS, Høst A, Damkier A: Use of complementary/alternative medicine among paediatric patients. *Eur J Pediatr.* 162(5):334–341, 2003

Mankinen R, Rantala O: Itsehoitolääkkeiden kaupan vapauttamisen merkitys kuluttajille ja kaupalle, ETLA discussion paper, No. 1204. Elinkeinoelämän Tutkimuslaitos (ETLA), The Research Institute of the Finnish Economy, Helsinki 2009

Martins AP, Miranda Ada C, Mendes Z, Soares MA, Ferreira P, Nogueira A: Self-medication in a Portuguese urban population: a prevalence study. *Pharmacoepidemiol Drug Saf* 11(5):409–414, 2002

McD Taylor D, Robinson J, Macleod D, MacBean CE, Braitberg G: Therapeutic errors among children in the community setting: nature, causes and outcomes. *J Paediatr Child Health* 45(5):304–309, 2009

Melchior M, Moffitt TE, Milne BJ, Poulton R, Caspi A: Why do children from socioeconomically disadvantaged families suffer from poor health when they reach adulthood? A life-course study. *Am J Epidemiol* 166(8):966–974, 2007

Menniti-Ippolito F, Gargiulo L, Bologna E, Forcella E, Raschetti R: Use of unconventional medicine in Italy: a nation-wide survey. *Eur J Clin Pharmacol.* 58(1):61–64, 2002

Miller JL, Binns HJ, Brickman WJ: Complementary and alternative medicine use in children with type 1 diabetes: a pilot survey of parents. *Explore (NY)* 4(5):311–314, 2008

Ministry of Social Affairs and Health: Valtioneuvoston periaatepäätös. Terveys 2015-kansanterveysohjelmasta. Sosiaali- ja terveysministeriön julkaisuja 2001:4, Ministry of Social Affairs and Health, Helsinki 2001

Ministry of Social Affairs and Health: Lääkepolitiikka 2020. Kohti tehokasta, turvallista, tarkoituksenmukaista ja taloudellista lääkkeiden käyttöä. Sosiaali- ja terveysministeriön julkaisuja 2011:2, Ministry of Social Affairs and Health, Helsinki 2011

Ministry of Social Affairs and Health: Sosiaali- ja terveydenhuollon kansallinen kehittämissuunnitelma KASTE 2012–2015. Sosiaali- ja terveysministeriön julkaisuja 2012:1. Sosiaali- ja terveysministeriö, Helsinki 2012

Ministry of Social Affairs and Health: Terveyspalvelut 6.6.2013 (accessed 16.9.2013). Available at: http://www.stm.fi/sosiaali_ja_terveyspalvelut/terveyspalvelut

Moraes AC, Delaporte TR, Molena-Fernandes CA, Falcão MC: Factors associated with medicine use and self medication are different in adolescents. *Clinics (Sao Paulo)* 66(7):1149–1155, 2011

National Agency for Medicines 2007: Lääkkeiden luokitus (ATC) ja määritellyt vuorokausiannokset (DDD). Eds. Voipio T. Edita Prima Oy, Helsinki 2007

National Center for Complementary and Alternative Medicine (NCCAM): Complementary, Alternative, or Integrative Health: What's In a Name? 20.1.2014 (accessed 14.3.2014). Available at: <http://nccam.nih.gov/health/whatisacam/>

National Institute for Health and Welfare (Terveyden ja hyvinvoinnin laitos, THL): Lasten ja nuorten terveysseurantatutkimus (LATE) 2012. (accessed 16.9.2013). Available at: <http://www.terveytemme.fi/lastenterveys/>

National Institute for Health and Welfare (Terveyden ja hyvinvoinnin laitos, THL): Health expenditure and financing 2011. Terveys 2013 (accessed 13.9.2013). Available at: http://www.thl.fi/tilastoliite/tilastoraportit/2013/Tr06_13.pdf

Nichol J, Thompson EA, Shaw A: Beliefs, decision-making, and dialogue about complementary and alternative Mmedicine (CAM): a qualitative study. *J Altern Complement Med* 17(2):117–125, 2011

Niskanen M: Itsehoitolääkevalikoima Suomessa ja muissa Euroopan maissa. Master thesis, School of Pharmacy, University of Eastern Finland, Kuopio 2012

Noonan K, Arensman RM, Hoover JD: Herbal medication use in the pediatric surgical patient. *J Pediatr Surg* 39(3):500–503, 2004

Office for National Statistics: Living in Britain, 2002 Edition - A summary of changes over time: Use of health services (accessed 12.12.2013). Available at: <http://www.ons.gov.uk/ons/rel/ghs/general-household-survey/2002-edition/a-summary-of-changes-over-time--use-of-health-services.pdf>

Organization of Economic Cooperation and Development (OECD): http://dx.doi.org/10.1787/health_glance-2011-en OECD Publishing (accessed 16.9.2013). Available at: http://dx.doi.org/10.1787/health_glance-2011-en

O'Keefe M, Coat S: Increasing health-care options: The perspectives of parents who use complementary and alternative medicines. *J Paediatr Child Health*, 46(6):296–300, 2010

Oshikoya KA, Senbanjo IO, Njokanma OF, Soipe A: Use of complementary and alternative medicines for children with chronic health conditions in Lagos, Nigeria. *BMC Complement Altern Med* 8:66, 2008

Ovaskainen H, Teräsalmi E, Seitsemän veljeksien apteekki: Käsikaupasta itsehoitoon. Selvitys itsehoidon ja itselääkinnän toteutumisesta ja tulevaisuuden näkymistä Suomessa. *Lääketeollisuus*. (accessed 13.9.2013) Available at: [http://www.laaketeollisuus.fi/Banners/laaketeollisuus_tutkimusraportti_VALMIS_NETTI_3%20\(ID%2018722\).pdf](http://www.laaketeollisuus.fi/Banners/laaketeollisuus_tutkimusraportti_VALMIS_NETTI_3%20(ID%2018722).pdf)

Palosuo H, Koskinen S, Lahelma E et al.: Terveyden eriarvoisuus Suomessa. Sosioekonomisten terveyserojen muutokset 1980–2005. Sosiaali- ja terveysministeriön julkaisuja 2007:23, Sosiaali- ja terveysministeriö, Helsinki 2007

- Pappila M: Itselääkinnän kustannukset ja säästöt potilaalle ja yhteiskunnalle. Kyselytutkimus apteekin asiakkaan lääkehoidon kustannuksista. Master thesis, School of Pharmacy, University of Kuopio, Kuopio 2008
- Petersen S, Bergström E, Brulin C: High prevalence of tiredness and pain in young schoolchildren. *Scand J Public Health* 31(5):367–374, 2003
- Pitetti R, Singh S, Hornyak D, Garcia SE, Herr S: Complementary and alternative medicine use in children. *Pediatr Emerg Care* 17(3):165–169, 2001
- Reinhardt Pedersen C, Madsen M: Parents' labour market participation as a predictor of children's health and wellbeing: a comparative study in five Nordic countries. *J Epidemiol Community Health* 56(11):861–867, 2002
- Reinstein JA: Worldwide trend in self-medication. *Dosis* 21(2):88–96, 2005
- Remes H: Social determinants of mortality from childhood to early adulthood. Academic dissertation. Publications of the Department of Social Research 2012:9 Sociology, Helsinki 2012
- Rimpelä A, Rainio S, Pere L et al.: Suomalaisten nuorten terveys 1977–2003. *Suom Lääkäril* 44(59):4229–4235, 2004
- Rony RY, Fortier MA, Chorney JM, Perret D, Kain ZN: Parental postoperative pain management: attitudes, assessment, and management. *Pediatrics* 125(6):e1372–e1378, 2010
- Savino F, Pelle E, Palumeri E, Oggero R, Miniero R: *Lactobacillus reuteri* (American Type Culture Collection Strain 55730) versus simethicone in the treatment of infantile colic: a prospective randomized study. *Pediatrics* 119(1):e124–e130, 2007
- Schulz RM, Holdford DA: Definitions and Meaning of Health. In: *Social and Behavioral Aspects of Pharmaceutical Care*. Eds. Smith MC, Wertheimer AI. Pharmaceutical Products Press, London, New York 1996
- Shaw A, Thompson EA, Sharp D: Complementary therapy use by patients and parents of children with asthma and the implications for NHS care: a qualitative study. *BMC Health Serv Res* 6:76, 2006
- Shen J, Oraka E: Complementary and alternative medicine (CAM) use among children with current asthma. *Prev Med* 54(1):27–31, 2012
- Sidora-Arcoleo K, Yoos HL, McMullen A, Kitzman H: Complementary and alternative medicine use in children with asthma: prevalence and sociodemographic profile of users. *J Asthma* 44(3):169–175, 2007
- Sihvo S, Klaukka T, Martikainen J, Hemminki E: Frequency of daily over-the-counter drug use and potential clinically significant over-the-counter-prescription drug interactions in the Finnish adult population. *Eur J Clin Pharmacol* 56(6–7):495–499, 2000

Simpson N, Roman K: Complementary medicine use in children: extent and reasons. A population-based study. *Br J Gen Pract* 51(472):914–916, 2001

Slone Epidemiology Center: Patterns of medication use in the United States 2006. A report from the Slone Survey

Smith C, Eckert K: Prevalence of complementary and alternative medicine and use among children in South Australia. *J Paediatr Child Health* 42(9):538–543, 2006

The Social Insurance Institution of Finland (Kela): Lääkekorvaukset 7.5.2013a (accessed 26.9.2013). Available at: <http://www.kela.fi/in/internet/suomi.nsf/NET/020402123907EH?OpenDocument>

The Social Insurance Institution of Finland: Statistical database Kelasto: Sickness 19.9.2013b (accessed 26.9.2013). Available at: http://www.kela.fi/web/en/statistical-database-kelasto_contents#Sickness

Spencer NJ, Coe C: Parent-reported infant health and illness in a whole year birth cohort. *Child Care Health Dev* 26(6):489–500, 2000

Statistics Finland, Suomen virallinen tilasto (SVT): Väestön koulutus rakenne (online). ISSN=1799–4586. Helsinki: Tilastokeskus (accessed: 7.6.2012). Available at: <http://www.stat.fi/til/vkour/index.html>

Su D, Li L: Trends in the use of complementary and alternative medicine in the United States: 2002–2007. *J Health Care Poor Underserved* 22(1):296–310, 2011

Suomen Apteekkariliitto: Vuosikatsaus 2012 (accessed 8.3.2014) Available at: http://www.apteekkariliitto.fi/media/pdf/vuosikatsaus_2012.pdf

Suomen Apteekkariliitto: Vuosikatsaus 2013 (accessed 8.3.2014) Available at: http://www.apteekkariliitto.fi/media/pdf/vuosikatsaus_2013.pdf

Takala P, Klaukka T, Rahkonen O: Astma ja allergia selittävät lasten pitkäaikaissairastavuuden lisääntymisen. *Suom Lääkäril* 41(56):4151–4155, 2001

Takala P, Klaukka T, Rahkonen O: Lasten lääkäripalvelujen käyttö. *Suom Lääkäril* 42(57):4199–4204, 2002

Tobi H, Meijer WM, Tuinstra J, de Jong-van den Berg LT: Socio-economic differences in prescription and OTC drug use in Dutch adolescents. *Pharm World Sci* 25(5):203–206, 2003

Tolonen H: Towards the high quality of population health surveys: standardization and quality control. Publications of the National Public Health Institute A27/2005. National Public Health Institute, Helsinki, and Faculty of Medicine, University of Kuopio, 2006

Tomlinson D, Hesser T, Ethier MC, Sung L: Complementary and alternative medicine use in pediatric cancer reported during palliative phase of disease. *Support Care Cancer* 19(11):1857–1863, 2011

- Trajanovska M, Manias E, Cranswick N, Johnston L: Parental management of childhood complaints: over-the-counter medicine use and advice-seeking behaviours. *J Clin Nurs* 19(13-14):2065-2075, 2010a
- Trajanovska M, Manias E, Cranswick N, Johnston L: Use of over-the-counter medicines for young children in Australia. *J Paediatr Child Health* 46(1-2):5-9, 2010b
- Turunen J: Kyselytutkimus. In: Yhteiskunnallinen lääketutkimus – Ideasta näyttöön. pp. 54-79. Eds. Hämeen-Anttila K, Katajavuori N. Palmenia, Helsinki 2008
- Uijen JH, van Duijn HJ, Kuyvenhoven MM, Schellevis FG, van der Wouden JC: Characteristics of children consulting for cough, sore throat, or earache. *Br J Gen Pract* 58(549):248-254, 2008
- Vaskilampi T, García M, Sanz E, Kalpio O: Perception and Treatment of Childhood Fever in Athens, Chapel Hill, Jyväskylä, Madrid, and Tenerife. pp. 105-123. In: *Children, Medicines, and Culture*. Eds. Bush P, Trakas D, Sanz E et al.. Pharmaceutical Products Press, New York 1996
- Vernacchio L, Kelly JP, Kaufman DW, Mitchell AA: Medication use among children <12 years of age in the United States: Results From the Slone Survey. *Pediatrics* 124(2):446-454, 2009
- Victorino CC, Gauthier AH: The social determinants of child health: variations across health outcomes - a population-based cross-sectional analysis. *BMC Pediatr* 9:53, 2009
- von Linstow ML, Holst KK, Larsen K, Koch A, Andersen PK, Høgh B: Acute respiratory symptoms and general illness during the first year of life: a population-based birth cohort study. *Pediatr Pulmonol* 43(6):584-593, 2008
- von Rueden U, Gosch A, Rajmil L, Bisegger C, Ravens-Sieberer U: Socioeconomic determinants of health related quality of life in childhood and adolescence: results from a European study. *J Epidemiol Community Health* 60(2):130-135, 2006
- Wadhwa V, Lemberg DA, Leach ST, Day AS: Complementary and alternative medicine in children attending gastroenterology clinics: usage patterns and reasons for use. *J Paediatr Child Health* 47(12):904-910, 2011
- Walsh A, Edwards H, Fraser J: Over-the-counter medication use for childhood fever: a cross-sectional study of Australian parents. *J Paediatr Child Health* 43(9):601-606, 2007
- Walsh A, Edwards H, Fraser J: Parents' childhood fever management: community survey and instrument development. *J Adv Nurs* 63(4):376-388, 2008
- West P, Sweeting H: Evidence on equalisation in health in youth from the West of Scotland. *Soc Sci Med* 59(1):13-27, 2004
- Westerlund M, Brånstad JO, Westerlund T: Medicine-taking behaviour and drug-related problems in adolescents of a Swedish high school. *Pharm World Sci* 30(3):243-250, 2008

Wong ICK, Chua SS, Edmondson H: Children's over-the-counter medicines pharmacoepidemiological (COPE) study. *IJPP* 15:17–22, 2007

Wong HH, Smith RG: Patterns of complementary and alternative medical therapy use in children diagnosed with autism spectrum disorders. *J Autism Dev Disord* 36(7):901–909, 2006

Wood D, Finlay F: Complementary and alternative medicine use in children with life-limiting conditions. *Nurs Child Young People* 23(4):31–34, 2011

World Health Organization (WHO): WHO definition of Health. WHO 1948 (accessed 7.5.2012). Available at: www.who.int/about/definition/en/print.html

World Health Organization (WHO): The role of the pharmacist in self-care and self-medication. Report of the 4th WHO consultative group on the role of the pharmacist. Hague, The Netherlands, 26–28 August, 1998. Department of Essential Drugs and Other Medicines, World Health Organization (accessed 26.9.2013). Available at: <http://apps.who.int/medicinedocs/pdf/whozip32e/whozip32e.pdf>

World Health Organization (WHO): Guidelines for the Regulatory Assessment of Medicinal Products for Use in Self-Medication. World Health Organization, Geneva 2000 (accessed 15.10.2013). Available at: <http://apps.who.int/medicinedocs/en/d/Js2218e/>

Zuzak TJ, Zuzak-Siegrist I, Simões-Wüst AP, Rist L, Staubli G: Use of complementary and alternative medicine by patients presenting to a Paediatric Emergency Department. *Eur J Pediatr* 168(4):431–437, 2009

Zuzak TJ, Zuzak-Siegrist I, Rist L, Staubli G, Simões-Wüst AP: Medicinal systems of complementary and alternative medicine: a cross-sectional survey at a pediatric emergency department. *Journal Altern Complement Med* 16(4):473–479, 2010

APPENDICES

Appendix 1. Cover letter

Kuopion yliopisto
Sosiaalifarmasian laitos
PL 1627
70211 Kuopio



Hyvä lapsen äiti tai isä

Tutkimme alle 12-vuotiaiden lasten lääkkeiden käyttöä ja siihen liittyviä ongelmia. Haluamme myös selvittää vanhempien ajatuksia lasten lääkehoidosta. Tutkimuksemme tukee tammikuussa 2007 voimaantulleen lastenlääkeasetuksen tavoitteita: saada lasten käyttöön tutkittuja, turvallisia ja tehokkaita lääkkeitä.

Lapsesi on yksi satunnaisesti tähän tutkimukseen valitusta 6000 alle 12-vuotiaasta suomalaislapsesta. Hänen nimensä ja sinun yhteystietosi on saatu väestörekisterikeskuksen (PL 7, 00521 Helsinki) väestötietojärjestelmästä. Lapsen nimi on valmiiksi painettu kyselylomakkeeseen. **Vastauksesi on tärkeä ja arvokas, vaikka lapsella ei olisi käytössään yhtään lääkettä.**

Toivomme, että kyselyyn vastaa aikuinen, joka yleensä huolehtii lapsen lääkkeiden käytöstä. Voit halutessasi pyytää lasta vastaamaan kysymyksiin kanssasi, esimerkiksi kertomaan kokemistaan oireista.

Vastaaminen on täysin vapaaehtoista. Täytettyäsi lomakkeen, palauta se oheisessa kuoressa **16.2.2007 mennessä**. Postimaksu on valmiiksi maksettu. Antamiasi tietoja käsitellään ehdottoman luottamuksellisesti. Kyselylomakkeessa on numero palautettujen lomakkeiden kirjanpitoa varten. Tällä tavoin yritämme välttää lähettämästä muistutusta jo kertaalleen vastanneille.

Vastaamalla kyselyyn annat arvokasta tietoa, josta on hyötyä lasten lääkehoitojen kehittämistyötä tekeville terveydenhuollon ammattilaisille ja sitä kautta kaikille lääkehoitoa saaville lapsille.

Yhteistyöstä kiittäen

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Professori, tutkimusryhmän johtaja
Sosiaalifarmasian laitos
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CHILDREN'S MEDICINE USE

Answer the questions by circling the best fitting alternative or writing down in the blank space. Your answers are important even if the child is not using any medicines.

BACKGROUND INFORMATION OF THE CHILD

1. The child is a

- 1 Girl
- 2 Boy

2. Date of birth

day		month		year			

3. Is the child

- 1 The firstborn
- 2 The second born
- 3 The third born
- 4 Other. Which one? _____

4. Which answer best describes the child's usual care during the day? (choose the one which they spend the most hours at per week)

- 1 Goes to school or preschool
- 2 Is taken care of by a child minder outside home
- 3 Is in the day-care-centre
- 4 Is taken care of at home alone or with brothers and sisters
- 5 Some other way. How? _____

HEALTH STATUS OF THE CHILD

5. What is your opinion about the health status of the child at the moment?

- 1 Good
- 2 Fairly good
- 3 Moderate
- 4 Fairly poor
- 5 Poor

6. Does the child have any illness or injury that has been diagnosed by a doctor?

- 1 No
- 2 Yes. What illness / illnesses?

7. Below is a list of symptoms. Circle for each symptom if the child is suffering it at the moment.

Symptoms	No	Yes	Don't know
Constipation	1	2	3
Diarrhoea	1	2	3
Stomach bug	1	2	3
Flatulence/Wind	1	2	3
Other stomach disorders, describe? _____	1	2	3
Headache	1	2	3
Pain in the neck or shoulders	1	2	3
Pain in the lower back	1	2	3
Earache	1	2	3
Sore throat	1	2	3
Growing pains	1	2	3
Other pain, describe? _____	1	2	3
High temperature/Fever	1	2	3
Symptoms of cold/flu (e.g. runny nose, cough)	1	2	3
Allergic symptoms (e.g. runny nose, eye symptoms)	1	2	3
Eczema or skin symptoms	1	2	3
Fatigue or feeling faint	1	2	3
Sleep disturbance	1	2	3
Tension or nervousness	1	2	3
Low spirit or depression	1	2	3
Some other symptom, describe? _____	1	2	3

THE CHILD'S MEDICINE USE

8. Is the child using any prescription medicines at the moment?

- 1 No (move to the question number 9)
- 2 Yes. List every medicine and its purpose of use. List also those medicines that are used as needed. You can continue on the last page.

Name of the medicine (e.g. Beclomet Easyhaler®)	Purpose of use (e.g. asthma)
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

9. Has your child taken yesterday or the day before yesterday any Over the counter (OTC) medicines, including vitamins?

- 1 No (move to the question number 10)
- 2 Yes. List every medicine and its purpose of use.

Name of the medicine (e.g. Pantyson®)	Purpose of use (e.g. skin rash)
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

10. Is the child using any OTC medicines or vitamins daily or almost daily?

- 1 No (move to the question number 11)
- 2 Yes. List all the medicines that are used daily or almost daily, and also how long the child has been using them.

Name of the product	How long has (s)he been using it? /Length of use
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

11. Has the child taken yesterday or the day before yesterday any medicinal herbs, botanicals, or homeopathic products?

- 1 No (move to the question number 12)
- 2 Yes. List all products and their purpose of use.

Product	Purpose of use
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

12. Has any medicine caused the child harm?

- 1 No (move to the question number 13)
- 2 Yes. List all the harms and medicines that have caused them. You can continue on the last page.

13. Have there been any other problems with the child's medication?

- 1 No (move to the question number 14)
- 2 Yes. What kind of problems? List also which medicines have caused them. You can continue on the last page.

14. At what age, on your opinion, can the child decide on taking a medicine for little ailments, e.g., headache, independently without any control or guidance of a parent?

- 1 < 4
- 2 4–5
- 3 6–7
- 4 8–9
- 5 10–11
- 6 12–13
- 7 14–15
- 8 16–17
- 9 18 or older
- 10 No opinion

INFORMATION SOURCES OF MEDICINES

15. Below is a list of information sources. Circle for every source how much you have used it when searching information concerning children's medication.

Source of information	Much	To some extent	Little	Not at all
Doctor/Physician	3	2	1	0
Nurse	3	2	1	0
Public health nurse / School health nurse	3	2	1	0
Relative or friend who is a health care professional	3	2	1	0
Pharmacist	3	2	1	0
Helpline, which one? _____	3	2	1	0
Patient information leaflet	3	2	1	0
Brochures concerning medicines	3	2	1	0
Medical books	3	2	1	0
Some other book, which one? _____	3	2	1	0
Health journals	3	2	1	0
Ordinary newspapers or magazines	3	2	1	0
Radio, television	3	2	1	0
The internet, which websites? _____	3	2	1	0
Family, friends	3	2	1	0
Health food shop /Natural product store	3	2	1	0
Other, what? _____	3	2	1	0

16. How reliable do you find the following information sources when searching information concerning children's medication?

Source of information	Very reliable	Reliable	Quite reliable	Not reliable	No opinion or haven't used
Doctor/Physician	4	3	2	1	0
Nurse	4	3	2	1	0
Public health nurse / School health nurse	4	3	2	1	0
Relative or friend who is a health care professional	4	3	2	1	0
Pharmacist	4	3	2	1	0
Helpline, which one? _____	4	3	2	1	0
Patient information leaflet	4	3	2	1	0
Brochures concerning medicines	4	3	2	1	0
Medical books	4	3	2	1	0
Some other book, which one? _____	4	3	2	1	0
Health journals	4	3	2	1	0
Ordinary newspapers or magazines	4	3	2	1	0
Radio, television	4	3	2	1	0
The internet, which website? _____	4	3	2	1	0
Family, friends	4	3	2	1	0
Health food shop /Natural product store	4	3	2	1	0
Other, what? _____	4	3	2	1	0

BACKGROUND INFORMATION

17. Who is the person that filled in this questionnaire?

- 1 Mother
- 2 Father
- 3 Other. Who? _____

18. What is your own mother tongue?

- 1 Finnish
- 2 Swedish
- 3 Other. What? _____

19. Number of children in the family _____**20. Your year of birth** _____**21. Did the child take part in filling in this questionnaire?**

- 1 No
- 2 Yes

22. Have you taken any degree in health care?

- 1 No
- 2 Yes. Which one?

23. Which province do you live in?

- 1 Lapland
- 2 Oulu
- 3 Eastern Finland
- 4 Western Finland
- 5 Southern Finland
- 6 Åland

24. What is your level of education? Circle the highest degree you have taken.

- 1 Primary school
- 2 School certificate (equivalent to year ten)
- 3 Higher School Certificate (leaving certificate/year 12)
- 4 Non University Diploma
- 5 Bachelors Degree (University)
- 6 Postgraduate University Degree

25. What is your current employment status? (Choose the one best option that describes your situation)

- 1 I'm working part-time/full time
- 2 I study or go to school
- 3 I'm a housewife/-husband
- 4 I'm temporarily absent from work (for example on maternity leave)
- 5 I'm on sick leave
- 6 I have been laid off or I'm unemployed
- 7 I'm retired

26. How much is your household's net income (the income after taxes) in its entirety? If you don't know it exactly you can mark your estimate of it.

- 1 Below 500 e
- 2 500–999 e
- 3 1000–1499 e
- 4 1500–1999 e
- 5 2000–2499 e
- 6 2500–2999 e
- 7 3000–3999 e
- 8 4000–4999 e
- 9 5000–7499 e
- 10 7500–10000 e
- 11 Over 10 000 e

27. Are you yourself using any prescription medicines at the moment?

- 1 No (move to the question no 28)
- 2 Yes. List all the medicines that you are using and their purpose of use.

Medicine
(e.g. Femoden®)

Purpose of use
(e.g. contraception)

28. Have you taken yesterday or the day before yesterday any Over the counter (OTC) medicines, including vitamins?

- 1 No (move to the question no 29)
- 2 Yes. List the name of the medicine and what you used it for.

Medicine
(e.g. Burana®)

Purpose of use
(e.g. headache)

29. Have you taken yesterday or the day before yesterday any medicinal herbs, botanicals, or homeopathics?

- 1 No (move to the question no 30)
- 2 Yes. List the name of the product and what you used it for.

Product

Purpose of use

30. Below is a list of statements. Circle the option nearest to your own opinion.

Statement	I agree completely	I agree	I don't agree or disagree	I disagree	I disagree completely	No opinion
Medicines are necessary in treating illnesses.	5	4	3	2	1	0
Side-effects of children's medicines worry me.	5	4	3	2	1	0
I try to avoid giving medicines to my child.	5	4	3	2	1	0
Over the counter (OTC) medicines are safe.	5	4	3	2	1	0
Fever, a natural means of defense of the child's body, should not be lowered artificially with medicines.	5	4	3	2	1	0
The child needs to learn how to bear the pain.	5	4	3	2	1	0
Prescription medicines are effective.	5	4	3	2	1	0
I usually give less analgesic to the child than is recommended in the instructions.	5	4	3	2	1	0
Prescription medicines are safe.	5	4	3	2	1	0
Medicines can disturb the body's own capability to heal illnesses.	5	4	3	2	1	0
Medicines that a doctor has prescribed for the child are necessary.	5	4	3	2	1	0
Medicines are unnatural to the human body.	5	4	3	2	1	0
I try to take care of my child's ailments by some other means than using medicines.	5	4	3	2	1	0
The more you need to use analgesics the less effective they are for pain.	5	4	3	2	1	0
I take care of my child's minor ailments by using OTC medicines.	5	4	3	2	1	0
Medicines are dangerous, even when used according to the instructions.	5	4	3	2	1	0
I take my child to see a doctor only when other ways of treatment do not help.	5	4	3	2	1	0
Long-term use of analgesics reduces the pain threshold.	5	4	3	2	1	0
OTC medicines are effective.	5	4	3	2	1	0
Doctors prescribe antibiotics to children too easily.	5	4	3	2	1	0
Interactions of medicines worry me.	5	4	3	2	1	0

THANK YOU!



SANNA SIPONEN
*Children's Health, Self-Care
and the Use of Self-Medication*

A Population-Based Study in Finland

Itsehoito on yleinen tapa hoitaa lasten lieviä oireita. Suomessa lasten itsehoidon yleisyyttä on viimeksi tutkittu vuonna 1995/96 osana laajempaa väestötutkimusta suomalaisten terveydestä ja terveystalve-lujen käytöstä. Tämän tutkimuksen tavoitteena oli tutkia millainen on suomalaisten lasten terveydentila, kuinka yleistä itsehoidon käyttö on lapsilla ja mitkä tekijät niihin ovat yhteydessä. Tutkimuksen aineistona käytettiin vuonna 2007 toteutettua väestötutkimusta alle 12-vuotiaiden lasten lääkkeiden käytöstä.



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