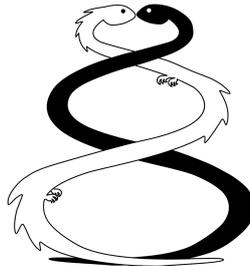


# Biophoton Therapy and Quality of Life of Children with Chronic Complaints and Food Hypersensitivities



## **Thesis**

to obtain the academic degree

Master of Science (MSc)

at the

Interuniversity College for Health and Development  
Graz / Castle of Seggau (college@inter-uni.net, www.inter-uni.net)

presented by

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Graz, November 2010

I hereby confirm that the contribution to the presented thesis is by myself according to the rules.

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Thesis angenommen

*Opinions and conclusions described in this thesis are in the responsibility of the author(s) and do not necessarily reflect the opinion of the Interuniversity College.*

*The presented thesis was prepared as proof of scientific work within the prescribed time period. The presented thesis gives an interesting compilation of basic materials on the selected topic. It provides a basis for further research and, after appropriate revision, publication.*

*Thesis accepted*

Graz, November 2010

# Summary

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The purpose of the presented research is to investigate the influence of Biophoton Therapy on chronic complaints among children and adolescents. A subgroup of the treated individuals stated that their experienced complaints were a consequence of a diagnosed food hypersensitivity. The main focus of the study lies with the effect on the frequency of occurrence of chronic complaints among children and adolescents and the possible improvement of their quality of life.

An important aspect of the subject under investigation is that there will be spoken of "chronic complaints" instead of "chronic disorders". A chronic disorder can only be diagnosed by a medical doctor, through valid methods or instruments according to professional standards. Chronic complaints, as opposed to disorders, can be determined by the child or adolescent itself and by their parents or guardians. To differentiate between incidental complaints and chronic complaints, and to define, in the first four criteria, what is meant in this study as a "chronic complaint among children", we will use the following inclusion criteria:

- The complaint occurs with children and adolescents up to and including 18 years of age.
- The complaint interferes with the child's normal daily routine(s).
- The complaint can be self-identified and is not (per se) based on a medical diagnosis.
- The complaint occurs frequently, i.e. daily or at least several times a week. The complaint had lasted for 3 months or a longer period of time already.
- The child is not using any drugs and is (currently) not under treatment of a medical doctor.

The research is set up as an open, not controlled, not randomised, observational study and was carried out among a group of 20 children and adolescents who suffered from chronic complaints. With 11 of the 20 children and adolescents, the parents or guardians of these individuals reported that the experienced complaints might be due to a food hypersensitivity that has been diagnosed by a medical doctor.

Biophoton Therapy, as applied in this research, consists of personalised treatment that is determined by measurement with the 'Biophoton Therapy Device by J. Boswinkel', where after the actual treatment is also given through the 'Biophoton Therapy Device by J. Boswinkel'. There will not be any physically tangible treatment, such as drugs, herbs or any other substances.

Before the beginning of the treatments, a questionnaire was filled out by the parents to establish the frequency of occurrence of the chronic complaints the child was suffering from. The Biophoton Therapy treatments all took place in the first 2 weeks of a 13-week period. At the end of the 13-week period, thus after a minimum of 11 weeks after the last treatment, the same questionnaire was filled out to assess the frequency of occurrence of the complaints of the individual.

The frequency of the experienced chronic complaints will also be used as a measure for the quality of life. This can be inferred because "complaints" refer to those symptoms that affect the

quality of life in a negative way, otherwise the symptoms would not be conceived as "complaints" by the parents and children or adolescents.

The total group of 20 children and adolescents whose questionnaires were analysed began the treatment with an average of 6.7 chronic complaints per individual. Of a total of 133 chronic complaints, 92.5% of the chronic complaints were resolved. This means that after treatment the complaint did not occur anymore, or, in some cases, not frequently enough to count as a chronic complaint according to the outlined inclusion criteria of a chronic complaint as used in this study. Most of the chronic complaints that were not entirely resolved did improve, in the sense that the complaint occurred less frequent than before the treatment. Of all 133 chronic complaints, 97.0% improved in their frequency of occurrence.

The food hypersensitivity subgroup consisted of 11 children and adolescents whose parents or guardians stated that their complaints were a consequence of a diagnosed allergic or non-allergic food hypersensitivity. Among those 11 children and adolescents, 86 chronic complaints were reported that met the inclusion criteria and they began the treatment with an average of 7.8 chronic complaints. Of the 86 chronic complaints among the 11 children and adolescents, 90.7% of the chronic complaints were totally resolved after treatment or reduced to only occur sporadically and 95.3% of the complaints improved in their frequency of occurrence.

The results of this observational study show that Biophoton Therapy given with the 'Biophoton Therapy Device by J. Boswinkel' decreases the frequency of chronic complaints and chronic complaints that are possibly associated with allergic and non-allergic food hypersensitivity. Because the vast majority of complaints did not occur anymore and the remainder of the complaints decreased in frequency of occurrence, inevitably this improved the quality of life of the individuals that were treated.

This study cannot be compared to a full-scale clinical trial in which an intervention is investigated under controlled conditions. Instead, a group of individuals that suffered from chronic complaints participated in an observational study in natural settings. It has to be stressed that the results of this study can be due to the Biophoton aspect of Biophoton Therapy intervention, but may in part be due to the psychosocial context of the treatment situation.

This study is aimed to be a first step to investigate if there is an influence of Biophoton Therapy on chronic complaints among children and adolescents and the improvement on their quality of life. Thus, a larger research project among a larger group of individuals is desirable. And to assess the effects over a longer period, further research could be done where the progress of the cooperating individuals is assessed at a regular interval.

In this study, the severity of the symptoms is not examined. Instead, the frequency of occurring complaints is examined and can be interpreted as a measure of degree of severity. The frequency of occurrence of the complaints among the children and adolescents serve as a measure of the quality of life. It may also be interesting not only to look at the quality of life, but also to see if Biophoton Therapy affects the symptoms diagnosed by medical doctors.

- 1) Hatzmann, J. (2009)  
*Consequences of care, about parents of children with a chronic disease*, Amsterdam.
- 2) Key, J.D., Brown, R.T., Marsh, L.D., Spratt, E.G., Reckno, J.C. (2001)  
"Depressive symptoms in adolescents with a chronic illness", *Children's Health Care*, vol. 30, nr. 4.
- 3) Marklund, B., Ahlstedt, S., Nordström, G. (2007)  
"Food hypersensitivity and quality of life", *Current Opinion in Allergy & Clinical Immunology*, vol. 7, nr. 3.
- 4) Mokkink, L.B., van der Lee, J.H., Grootenhuis, M.A., Offringa, M., van Praag, B.M.S., Heymans, H.S.A. (2006)  
*Omvang en gevolgen van chronische aandoeningen bij kinderen*, Emma Kinderziekenhuis AMC, Amsterdam.
- 5) Popp, F.A. (1999)  
*About the Coherence of Biophotons*, International Institute of Biophysics.

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# 1. Introduction

This research was performed to obtain the Academic Master Degree of Complementary and Integrated Health Sciences of the Interuniversity College for Health and Development, based in Graz, Austria. This thesis is established and written to report the authors' research, including background information and state of knowledge on the associated subjects concerning this research; Biophoton Therapy and chronic complaints among children and adolescents. In this research, the focus will be on the effect of Biophoton Therapy on the quality of life of children suffering from chronic complaints, possibly associated with allergic and non-allergic food hypersensitivity.

To illustrate the fundamental base of this research, the first part of this thesis will inform in general on Biophotons, chronic complaints among children and allergic and non-allergic food hypersensitivity. At the end of chapter one, the research question will be formulated and described. The second chapter of this thesis is about the research in practice and includes the design and methods used in this research. In the third chapter, the processed results and any remarkable observations will be presented. In chapter four there will be a discussion of the results of this research, containing critical notes of weaknesses in the research and ideas for further research in this subject.

The first part of this thesis, the introduction, will comprise of several parts, beginning with background information of Biophoton Therapy as a fundamental base of this study-field and this research.

## 1.1 State of scientific knowledge on Biophotons

This part of the introduction has the purpose to inform in general about the background of the related research that is based on the concepts of Biophotons and its applied technology, and the research findings behind it.

One of the reasons to give some more explanation to this study-field is that the focal point of Biophotons is not yet very common within the scientific community. The two groups of students, merely from the Netherlands, have decided together with the staff of the Interuniversity College to explore this field more, since the Biophoton theory in practice was also the study background of the members of these groups.

In the final stage during the research period, the students had either one of two focuses to deal with: Fundamental Research or Clinical Research. And, as already mentioned, both groups work with the fundamentals of Biophotons. The different subjects of the theses are related to agricultural aspects, animals and human beings.<sup>1</sup>

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<sup>1</sup> For example: research on seedlings, tomatoes and milk, research on animal neurones and clinical research on human beings.

What Biophotons are and how they work will be explained in the following paragraphs, starting with photons, then Biophotons and finally some information on the 'Biophoton Therapy Device by J. Boswinkel'.

### 1.1.1 Photons

In physics, a photon is an elementary particle, the quantum of the electromagnetic interaction and the basic unit of light and all other forms of electromagnetic radiation. It is also the carrier of the electromagnetic force. The effects of this force are easily observable at both microscopic and macroscopic level, because the photon has no rest mass; this allows for interactions at long distances. Like all elementary particles, photons are governed by quantum mechanics and will exhibit wave-particle duality —□they exhibit properties of both waves and particles. For example, a single photon may be refracted by a lens or exhibit wave interference with itself, but also act as a particle giving a definite result when quantitative momentum is measured.

The modern concept of the photon was gradually developed by Albert Einstein to explain experimental observations that did not fit the classical wave model of light. In particular, the photon model accounted for the frequency dependence of the energy of light and explained the ability of matter and radiation to be in thermal balance. <sup>2</sup>

The photon concept has led to momentous advances in experimental and theoretical physics, such as lasers, quantum field theory and the possible interpretation of quantum mechanics. It has been applied to photochemistry, high-resolution microscopy and measurements of molecular distances. Recently, photons have been studied as elements of quantum computers and for sophisticated applications in optical communication such as quantum cryptography. <sup>3</sup>

### 1.1.2 Biophotons

Biophotons are weak emissions of light radiated from the cells of all living things. A photon is a single particle of light. Plants, animals and humans have an intensity of their emission from some hundreds up to one thousand photons per second per cm<sup>2</sup> and an almost continuous spectrum within the optical range of at least 200-800 nm. <sup>4</sup> All organisms, including plants, constantly produce photons as part of their vital activities. The light of the photon is too faint to be seen by the naked eye. The weakness of its light can be compared to candlelight seen at a distance of 20 km. Photons have been detected and verified without doubt by using a photomultiplier <sup>5</sup>. Since

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<sup>2</sup> D. Flenniken (2010), "It is not a miracle, it is supernatural", blog article:  
<http://blog.genuineobservations.com/2010/05/18/it-is-not-a-miracle-it-is-supernatural>

<sup>3</sup> G. Brassard (1993), *Bibliography of Quantum Cryptography*, Université de Montréal.

<sup>4</sup> M. Bischof (2001), *Biophotonen: Das Licht in unseren Zellen*, Frankfurt.

<sup>5</sup> Used photomultiplier: Type EMI 9558 QB

they originate from living cells, we call them Biophotons. The study field of Biophotons: Biophotonics, is part of Life Sciences, according to the International Institute of Biophysics, Neuss, Germany.

### 1.1.3 History and research

Around 1923 the Russian scientist Prof. Alexander Gurwitsch discovered an "ultra-weak" photon-emission from living systems, i.e. onions and yeast, since he suggested connections between photon emission and cell division rate. He called this photon emission "mitogenetic radiation".<sup>6</sup> His experiments indicated a wavelength in the range of around 260 nm.<sup>7</sup> After initial worldwide recognition in the 1920's and 1930's, some claims appeared that the "mitogenetic radiation" did not exist at all. Because of that, and the subsequent political cataclysms in Europe and Russia, work on this phenomenon dropped almost to zero level. However, in the 1950's a group of Italian physicists including L. Colli, made a very sensitive photomultiplier with which they discovered light — in the spectrum range from green to red — emitted from seedlings, corn and beans with photons in quantities of 10 to a 100 per second per cm<sup>2</sup>.<sup>8</sup>

It was in 1974 that the German biophysicist Prof. Dr. Fritz-Albert Popp proved the existence of the photons. At that time, he was looking for an understanding about the optical properties of the molecule Benzpyrene in relation to carcinogenicity. With Gurwitsch' mitogenetic radiation research at hand, Popp concluded that if the assumed optical effect of Benzpyrene were correct, then there must be some kind of light source in the cell and very weak photon 'signals' would be able to trigger drastic changes in the behaviour of cells.

With Popp's photomultiplier, it was possible to prove that low-level light emissions are a common property of all living cells. It has different intensities for human, plant or animal cells, for different cell types and it can vary from one moment to the next. It is not regular, but comes often as 'photon explosions' or 'spikes', especially when the cells are irritated by outside means and in the case of cell death.<sup>9</sup>

The results of Popp's research also indicate that Biophotons originate from a coherent, and/or squeezed, photon field within the living organism, its function being intra- and intercellular regulation and communication.<sup>10</sup> The Russian scientist A.B. Burlakov repeated the experiments of Gurwitsch in the 1990's and proved that there is Biophoton exchange and influence between fertilised fish eggs that were in optical contact, divided by quartz glass filters.<sup>11 12</sup>

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<sup>6</sup> Bischof, *Biophotonen: Das Licht in unseren Zellen*.

<sup>7</sup> A. Gurwitsch (2003), *History of Biophotonik or Biophotonics from a German point of view*, regarding Gurwitsch's "Bibliography under Gurwitsch and also Ruth (1977, 1979)".

<sup>8</sup> Bischof, *Biophotonen: Das Licht in unseren Zellen*.

<sup>9</sup> W. Lillge, M.D. (2001), "Biophysics And the Life Process", *21st Century*, summer 2001.

<sup>10</sup> F.A. Popp (1999), *About the Coherence of Biophotons*, International Institute of Biophysics.

<sup>11</sup> L.V. Belousov, A.B. Burlakov, N.N. Luchinskaia (2002), "Statistical and frequency-amplitude characteristics of ultraweak emissions of the loach eggs and embryos under the normal conditions and during their optic interactions. I.

### 1.1.4 Biophotons and DNA

According to this leading researcher of Biophotons in the last 35 years, Prof. Dr. Popp, light is constantly being absorbed and remitted by DNA molecules within each cell's nucleus. The DNA-string has the optimal length for receiving and sending electromagnetic frequencies with its information. Beside this, these Biophotons create a dynamic, coherent web of light. A system that could be responsible for chemical reactions within the cells, cellular communication throughout the organism and the overall regulation of the biological system, including embryonic development into a predetermined form. According to Popp, in a live interview to be seen on the Internet <sup>13</sup>, a chemical reaction in a cell can only happen if the molecule which is reacting, is excited by a photon. So, the photon is necessary to stimulate a molecule to a chemical reaction. This means that every living cell is producing light.

### 1.1.5 Coherence

In photosynthesis, where photons are used to get energy, the coherence is extremely high. Coherence means that the photons can be super-positioned, so that the message, which is submitted by the photons, gets very clear. <sup>14</sup>

The laser-like coherence of the Biophoton field is a significant attribute, making it a prime candidate for exchanging information in a highly functional, efficient and cooperative fashion, lending credence to the idea that it may be the intelligence factor behind biological processes. It is a known fact that the speed of light is faster than any chemical reaction.

Biophoton emissions will vary according to the functional state of the organism. If a disease such as cancer affects certain cells, they will radiate a different photonic signature than healthy cells of the same type. In this way, Biophotons can be a non-invasive tool for assessing the state of health or vitality. Applications can extend far into other areas like testing food and water quality, checking for chemical or electromagnetic contamination, or agricultural testing for products that improve crop resistance to disease. Biophysicists in many European and Asian countries are currently engaged in such research. <sup>15</sup>

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Characteristics of ultraweak emission in normal development and the optic role of egg envelopes", *Ontogenez*, 33(3), pp. 213-221.

<sup>12</sup> L.V. Belousov, A.B. Burlakov, A.A. Konradov (1999), *Frequency patterns of ultraweak photon emission from the developing eggs and embryos of a fish, Misgurnus Fossilus L.*, Conference on Biophotons 1999, Faculty of Biology, Moscow State University and Institute of Biochemical Physics, Russian Academy of Sciences.

<sup>13</sup> Life interview for Science and Spirituality television station on Youtube 2008, especially last eight minutes. <http://www.youtube.com/watch?v=zcmaMV1TETU>

<sup>14</sup> Popp, *About the Coherence of Biophotons*.

<sup>15</sup> See website of International Institute of Biophysics (Neuss, Germany) for different articles on ongoing research on Biophotons: [www.lifescientists.de](http://www.lifescientists.de)

Popp's Biophoton theories and concepts provide an intriguing and promising path for more international research which could lead to major developments in our understanding of life, the mechanisms of healing and health for all living creatures and the interconnection with the world around us.

### 1.1.6 Biophoton Therapy Device by J. Boswinkel

The research linked with these theses use, as a medium to transfer information, the 'Biophoton Therapy Device by J. Boswinkel'. According to the manufacturer this device operates on the following principles:

- Each cell emits Biophotons and they provoke up to 100.000 chemical reactions per second.
- Every living cell emits its own characteristic light pattern.
- When a cell is healthy, it emits coherent light and when a cell is diseased, it emits chaotic light.
- Every biochemical reaction is preceded by an electromagnetic signal, the Biophoton, that 'steers' the chemistry of the cell with certain information.
- When the steering signal within the cell is inadequate, then the biochemistry does not work properly and the cell will show certain symptoms of disturbance.
- The 'Biophoton Therapy Device by J. Boswinkel' corrects the steering signal, which in turn corrects the biochemistry in the cells.

In the described research of these theses, the device is used to alter the condition of living organisms or cells.

The inventor of the 'Biophoton Therapy Device' is Dr. Johan Boswinkel. Since the early 1980's, he has consequently been developing instruments in order to establish a therapeutic application of Biophotons. Together with Dr. R. van Wijk of the University of Utrecht who is also a member of Prof. Dr. Popp's team, he e.g. performed four experiments in order to determine the influence of his device on the quality of milk. There was a significant result, though more research work is to be done.

Johan Boswinkel uses the statement: "Light is the language of life, Biophotons hold the keys to the quality of all living beings".<sup>16</sup>

## 1.2 State of scientific knowledge on chronic complaints among children

This part of the introduction has the purpose to set out the background and state of knowledge on the subject of chronic complaints among children and adolescents, food hypersensitivity and chronic complaints due to food hypersensitivity. Aside from background information on the prevalence of chronic disorders and food hypersensitivities, chronic complaints will be linked to the quality of life of children and adolescents.

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<sup>16</sup> Website of the Institute of Applied Biophoton Sciences: <http://www.biontology.com>

## 1.2.1 Chronic disorders among children

Late 2003 the Emma Kinderziekenhuis AMC Amsterdam started a research project, with financial support from the Ministry of Social Affairs and Employment, to determine the number of children and adolescents in the Netherlands with a chronic disease and to evaluate the consequences of living with a chronic disease. In 2006, the results of the research project were published in the report: *Extent and Consequences of Chronic Disorders among Children*.<sup>17 18</sup>

The first requirement of the AMC research project was to define the concept of "chronic diseases among children", because a usable and well-founded definition could not be found in international literature.<sup>19</sup> Due to the attained consensus on the definition, which consists of four criteria, the report speaks of "chronic *disorders* among children" and no longer of "chronic *diseases* among children". The reason for this, given in the report, is that the term "disease" suggests the existence of an active and variable pathophysiology process that runs in a more or less fixed pattern. Many disorders are defined based on symptoms, whether they have a connection to an underlying "disease" or not.

The conclusion of this report states that at least 14 percent of the children and adolescents in the Netherlands are suffering from a chronic disorder. That amounts to about 500,000 children in the Netherlands.

According to the AMC report a condition or disorder is considered to be a "chronic disorder among children" if the following four criteria are met:

- The disorder occurs with children and adolescents up to and including 18 years of age.
- The diagnosis is based on medical scientific knowledge and it can be diagnosed using reproducible and valid methods or instruments according to professional standards.
- The disorder is not (yet) curable.
- The disorder has been present for at least three months or will very probably last longer than three months, or it has occurred three times or more during the past year.

Given the stringent selection criteria, by which only a medical doctor can diagnose if a patient is suffering from a chronic disorder, we may assume that the number of children suffering from a chronic disorder will be greater than the estimated 500,000.

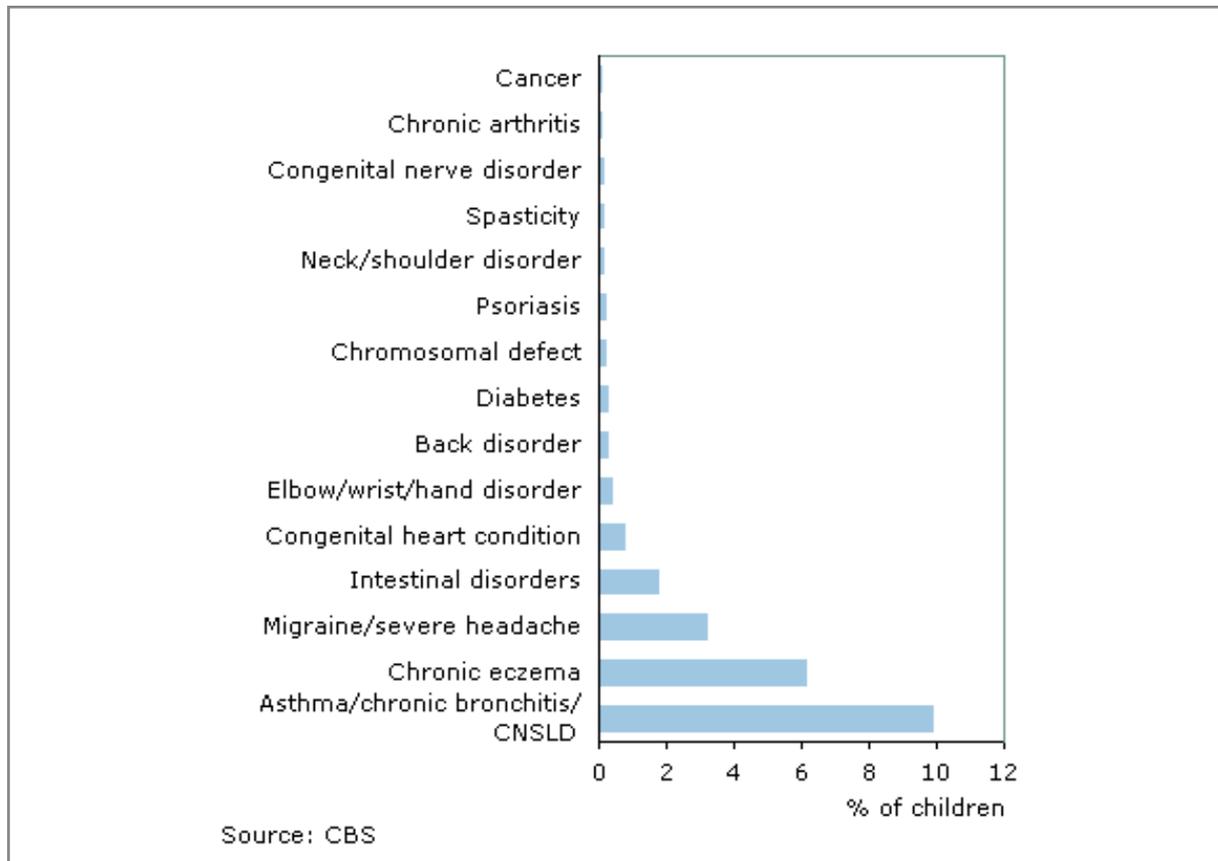
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<sup>17</sup> The original term used in the title is "chronische aandoeningen bij kinderen". This can be translated as to mean "children with chronic disorders" or "chronic disorders among children". Both meanings are used in the AMC report.

<sup>18</sup> L.B. Mokkink, J.H. van der Lee, M.A. Grootenhuys, M. Offringa, B.M.S. van Praag, H.S.A. Heymans (2006), *Omvang en gevolgen van chronische aandoeningen bij kinderen*, Emma Kinderziekenhuis AMC, Amsterdam.

<sup>19</sup> *ibid.*, p. 17

According to a 2008 publication of the Central Bureau of Statistics (CBS) of the Netherlands, one in five children aged 4-12 years suffered from a chronic disease or chronic disorder, averaged over the period 2001-2007.<sup>20</sup> This means that 20 percent of the children in this age suffered from a chronic disease or chronic disorder and this amounts to about 270,000 children in this age alone. The criteria of the CBS report are different from those used in the AMC report and, furthermore, the parents of the children completed the questionnaires used for the CBS report.



**Figure 1.** Chronic disorders among children in the Netherlands aged 4-12, 2001-2007.

In the authors' research on children suffering from chronic complaints and the treatment with Biophoton Therapy, the focus will be on and there will be spoken of "complaints" instead of "disorders". This is because of the fact that apparently a chronic disorder can only be diagnosed by a medical doctor through reproducible and valid methods or instruments according to professional standards.<sup>21</sup> Chronic complaints, as opposed to disorders, can be determined by the patient itself and by the people close to him or her. A disease or disorder is a name the medical community gives to what might be the cause of the complaints or symptoms. In other words, a

<sup>20</sup> dr. M. van Herten (2008), "De gezondheid van Nederlandse kinderen", Dr. O. van Hilten, ir. A.M.H.M. Mares, eds. *Gezondheid en zorg in cijfers 2008*, Centraal Bureau voor de Statistiek, Den Haag

<sup>21</sup> Refer to the second criterium of the definition of a chronic disorder by the AMC report.

disease or disorder is a collection of a number of occurring complaints that together are represented by the name of a disorder.

Both research conducted by Janneke Hatzmann<sup>22</sup> and the report of the AMC show that virtually all studies aimed at chronic diseases and chronic disorders focus on the surviving rates of children; a quantity-advantage. In the authors' research, the focus will be primarily on quality of life. Potentially, a quality-advantage can lead to a quantity-advantage. Therefore, in the authors' research the focus will be solely on the complaints of children and the resulting quality of life.

Only a few studies directly aimed on the quality of life of children with chronic disorders are available. Aside from the obvious burdens of suffering from a chronic disorder, these studies have shown that chronic disorders have a significant impact on the individuals' quality of life and that of their family.

In 2001, a study was conducted to examine the symptoms of depression in adolescents with various chronic diseases or chronic disorders. All individuals were aged 13-18 years. Overall, a higher percentage of adolescents with a chronic disease or chronic disorder reported symptoms of moderate to severe depression, compared to a control group.<sup>23</sup>

Another study was aimed to get insight into the quality of life of chronically diseased children and adolescents, as reported both by the individuals themselves and by their mothers. The results show that patients with diabetes rate themselves as the most emotionally burdened and impaired in nearly all aspects of life. Children generally pinpoint most of their difficulties in the areas of "the ability to occupy themselves" and "psychological health".<sup>24</sup>

## 1.2.2 Food hypersensitivity

In 2003, the Nomenclature Review Committee of the World Allergy Organisation issued a report of revised nomenclature for use on food allergies and food intolerances. Food hypersensitivity refers to all types of adverse reactions against a food component and thus includes food allergy and food intolerance.

A food allergy, a form of food hypersensitivity, is an adverse immune response to a specific food component. A person suffering from a food allergy will develop complaints after ingesting a particular food that is normally tolerated by most healthy people. The substances present in food that initiate the allergic reactions are called allergens, most commonly a protein or protein

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<sup>22</sup> J. Hatzmann (2009), *Consequences of care, about parents of children with a chronic disease*, Amsterdam.

<sup>23</sup> J.D. Key, R.T. Brown, L.D. Marsh, E.G. Spratt, J.C. Reckno (2001), "Depressive symptoms in adolescents with a chronic illness", *Children's Health Care*, vol. 30, nr. 4, p. 283-292.

<sup>24</sup> E. Wurst, M. Herle, R. Fuiko, M. Hajszan, C. Katkhouda, A. Kieboom, M.T. Schubert (2002), "Zur Lebensqualität chronisch kranker und psychisch auffälliger Kinder: erste Erfahrungen mit dem Inventar zur Erfassung der Lebensqualität bei Kindern und Jugendlichen", *Zeitschrift für Kinder- und Jugendpsychiatrie und Psychotherapie*, vol. 30, nr. 1, p. 21-28.

fragment. The adverse reactions due to food allergy occur when the body's immune system mistakenly identifies a protein as being harmful by tagging the proteins or parts of proteins in the food by Immunoglobulin E (IgE).<sup>25</sup>

Antibodies, medically known as immunoglobulins, are gamma globulin proteins that are produced in response to the intrusion of foreign substances and cells, like bacteria and viruses, and are found in blood or other bodily fluids.<sup>26</sup> Immunoglobulins belong to the globulin fraction of the blood, form an important part of the immune system and are produced by plasma cells, a kind of white blood cells. Five different types of Immunoglobulins are known and each of them performs a different task in the immune response, depending on the type of the foreign substance or cell.<sup>27</sup> All antibodies are of very similar general structure, but a small part on the tip of the protein is highly variable. Each of the millions of slightly different antibodies can bind to a different target, known in medical terms as an antigen.<sup>28</sup> The huge diversity of antibodies allows the immune system to recognise a wide variety of antigens. Recognition of an antigen by an antibody allows other parts of the immune system to attack this antigen. Antibodies can also neutralise targets directly by, for example, binding to a part of a pathogen that it needs to cause an infection.<sup>29</sup> Immunoglobulin E is a class of antibody that is especially associated with type 1 hypersensitivity, i.e. IgE-mediated allergy.

Food intolerance, or non-allergic food hypersensitivity, is also a negative reaction to a food or a compound found in foods, but does not directly involve the immune system. Reactions due to food intolerance produce symptoms in one or more body organs and systems, including pharmacologic, metabolic and gastrointestinal responses. Where, strictly speaking, a true food allergy does require the involvement of the immune system, and of which most are IgE-mediated, food intolerance does not.<sup>30</sup>

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<sup>25</sup> H.J. Gould et al. (2003), "The biology of IGE and the basis of allergic disease", *Annual review of immunology*, vol. 21, pp. 579-628.

<sup>26</sup> G.W. Litman, J.P. Rast, M.J. Shablott, R.N. Haire, M. Hulst, W. Roess, R.T. Litman, K.R. Hinds-Frey, A. Zilch, C.T. Amemiyag (1993), "Phylogenetic diversification of immunoglobulin genes and the antibody repertoire", *Molecular Biology and Evolution*, 10(1), pp. 60-72.

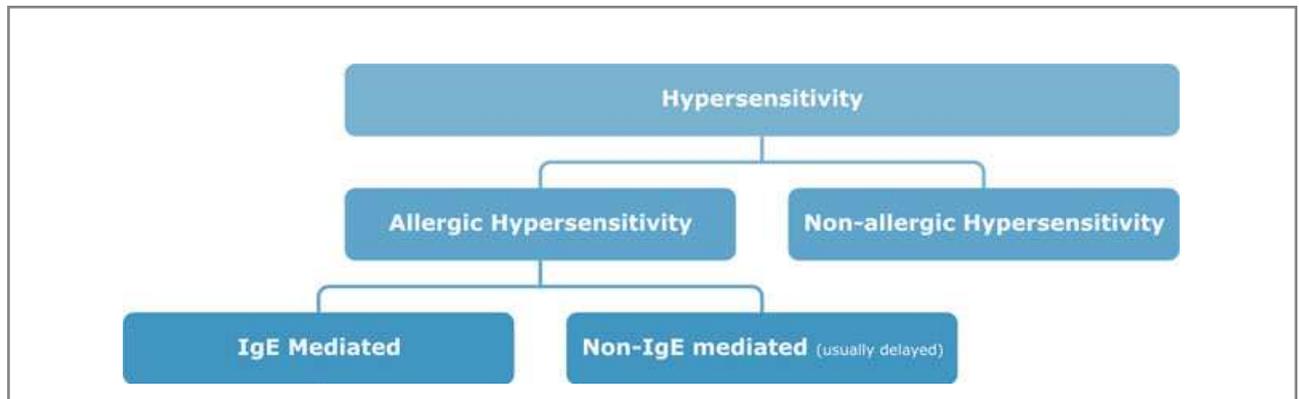
<sup>27</sup> E. Market, F.N. Papavasiliou (2003), "V(D)J Recombination and the Evolution of the Adaptive Immune System", *PLoS Biology*, 1(1).

<sup>28</sup> C.A. Janeway, P. Travers, M. Walport, M.J. Shlomchik (2001), *Immunobiology (5th edition)*, Garland Publishing, New York.

<sup>29</sup> R.A. Rhoades, R.G. Pflanzler (2002), *Human Physiology (4th edition)*, Thomson Learning.

<sup>30</sup> R. Gerth van Wijk, P.B. van Cauwenberge, S.G. Johansson (2003), "Herziene terminologie voor allergie en verwante aandoeningen", *Nederlands Tijdschrift Tandheelkunde*, 110(8), pp. 328-331.

With non-allergic food hypersensitivity, reactions on food or compounds found in foods can be delayed or dose-dependant and this is what makes it difficult to determine the poorly tolerated substance. And although this type of food hypersensitivity is more chronic, it is often more difficult to diagnose because it is less acute and less obvious in its clinical presentation.<sup>31</sup> There seems to be no worldwide scientific consensus on the pathogenesis of food intolerance and the term "food allergy" is widely misused for all adverse reactions to food.



**Figure 2.** Classification of different forms of hypersensitivity.

The percentages of prevalence of food hypersensitivity among children vary greatly between studies. According to a US study, published in 2007, 6 to 8 percent of children under the age of 3 and nearly 4 percent of adults suffered from IgE-mediated food allergies.<sup>32</sup> A rather large research project in the Netherlands, conducted around 1991, was aimed to assess the prevalence of food hypersensitivity among 5- and 6-years-old children. The prevalence of 'probable' food hypersensitivity based on the parents' perception was 3.8 percent.<sup>33</sup> In the UK and the Netherlands approximately 25 percent of people self-reported food hypersensitivity, although food allergy could only be confirmed by double blind placebo-controlled food challenge in only 2 percent.<sup>34</sup>

<sup>31</sup> J.A. Vanderhoof (1998), "Food hypersensitivity in children", *Current Opinion in Clinical Nutrition & Metabolic Care*, 1(5), pp. 419-422.

<sup>32</sup> National Institute of Allergy and Infectious Diseases (July 2007), *Food Allergy: An Overview*, National Institutes of Health, p. 1

<sup>33</sup> H.A. Aardoom, R.A. Hirasings, R.J. Rona, F.L. Sanavro, E.W. van den Heuvel, J. Leeuwenburg (1996), "Food intolerance (food hypersensitivity) and chronic complaints in children: the parents' perception", *European Journal of Pediatrics*, vol. 156, nr. 2, pp. 110-112.

<sup>34</sup> G. Arslan, R. Lind, S. Olafsson, E. Florvaag, A. Berstad (2004), "Quality of Life in Patients with Subjective Food Hypersensitivity: Applicability of the 10-Item Short Form of the Nepean Dyspepsia Index", *Digestive Diseases and Sciences*, vol. 49, nr. 4, pp. 680-687.

### 1.2.3 Food hypersensitivity, chronic complaints and quality of life

Research in the field related to food hypersensitivity and quality of life is scarce, but the psychosocial impact of food hypersensitivity and the information gaps concerning food hypersensitivity have received more attention lately.

Aside from the more familiar burdens of having food allergy or food intolerance, recent findings<sup>35</sup> report that several domains of quality of life are affected, such as social and family activities, emotional issues and family economy. A relatively high percentage of food hypersensitive young adults do not participate in the labour market, and adolescents suffering food allergy are a higher number of weeks absent from school, compared to a control group. Food hypersensitivity with children limits them to large extent in their autonomous social activities. So, although not much research has been conducted in this field, it is obvious that food hypersensitivity has a significant impact on the individuals' quality of life and that of their family.

Symptoms and complaints due to food allergy vary greatly. With IgE-mediated food allergies, the IgE becomes attached to cells in different parts of the body, most commonly in the skin, gastrointestinal tract and respiratory tract. When individuals ingest allergens, i.e. the substances that initiate the allergic reactions, these allergens react with the IgE attached to the cell surfaces. Because the food allergens are absorbed by the intestine and carried to other parts of the body, these reactions may occur in any part of the body distant from the gastrointestinal tract.<sup>36</sup>

Reactions of IgE-mediated food allergy usually begin within minutes or a few hours after ingesting the allergen. Simply touching or smelling the offending food can even produce an allergic reaction in very sensitive individuals. The most common symptoms are from the gastrointestinal tract<sup>37</sup>, from the respiratory tract<sup>38</sup> and from the skin<sup>39,40,41</sup>. The most severe allergic reaction is anaphylactic shock, a reaction involving several bodily systems, including hypotension, loss of consciousness and possibly death.

Non-IgE-mediated allergic reactions include food-induced enterocolitis, i.e. inflammation of the small intestine and colon.

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<sup>35</sup> B. Marklund, S. Ahlstedt, G. Nordström (2007), "Food hypersensitivity and quality of life", *Current Opinion in Allergy & Clinical Immunology*, vol. 7, nr. 3, pp. 279-287.

<sup>36</sup> C. Ortolani, C. Bruijnzeel-Koomen, C. Bindslev-Jensen, B. Björkstén, D.A. Moneret Vautrin, K. Nékám, B. Wüthrich (1995), "Position paper on adverse reactions to food", *Allergy*, nr. 50, pp. 623-635.

<sup>37</sup> e.g. oral allergy syndrome, cramps, nausea, vomiting, diarrhoea and abdominal pain.

<sup>38</sup> e.g. wheezing, allergic rhinitis and allergic asthma.

<sup>39</sup> e.g. hives, angiooedema, atopic dermatitis and protein contact dermatitis.

<sup>40</sup> C. Ortolani, E.A. Patorello (2006), "Food allergies and food intolerances", *Best practice & research. Clinical gastroenterology*, 20(3), pp. 467-483.

<sup>41</sup> Z. Pastar, J. Lipoženić (2006), "Adverse reactions to food and clinical expressions of food allergy", *Skinmed*, 5(3), pp. 119-125.

### 1.3 Research question

Chronic complaints among children have an influence on the quality of life of these children, as well as their parents, guardians or any other possible family members. In the Netherlands, 14 percent of the children and adolescents is currently growing up while suffering from a chronic disease or chronic disorder<sup>42</sup> and will often experience a number of associated chronic complaints or symptoms that interfere with their daily routine. At least 2 percent of Dutch children suffer from food hypersensitivity that cause a variety of chronic complaints and affects various aspects of the quality of life of these children.

These circumstances have incited the authors to do research on the effect of Biophoton Therapy on children with chronic complaints and led to the following research questions:

*Ellen Pet-Reatsch:*

Does Biophoton Therapy have influence on chronic complaints among children and adolescents?  
Can Biophoton Therapy increase the quality of life of children and adolescents who are suffering from chronic complaints?

*Wim Pet:*

Does Biophoton Therapy have influence on chronic complaints among children and adolescents suffering from allergic and non-allergic food hypersensitivity? Can Biophoton Therapy increase the quality of life of children and adolescents who are suffering from allergic and non-allergic food hypersensitivity?

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<sup>42</sup> Mokkink et al., *Omvang en gevolgen van chronische aandoeningen bij kinderen*.

## 2. Methods

### 2.1 Design and execution of the study

The study was carried out among a group of 20 children and adolescents who suffered from chronic complaints. With 11 of the 20 children and adolescents, the parents or guardians of these individuals reported that the experienced complaints might be due to a food hypersensitivity that has been diagnosed by a medical doctor. All the individuals underwent treatment with Biophoton Therapy. This is an open, not controlled, not randomised, observational study.

Before the beginning of the Biophoton Therapy treatments, a questionnaire <sup>43</sup> was filled out to establish the frequency of occurrence of 24 common chronic complaints. The used questionnaire refers to a concept of man and health in the line of integrated healthcare as used in this study-field. Thus, some links between categories and subcategories may seem unfamiliar to the concepts of mainstream medicine. The questionnaire was developed through extensive deliberation with the thesis supervisor and the Interuniversity College for Health and Development.

The frequency of the experienced chronic complaints will also be used as a measure for the quality of life. This can be inferred because "complaints" refer to those symptoms that affect the quality of life in a negative way, otherwise the symptoms would not be conceived as "complaints" by the parents and children or adolescents. <sup>44</sup>

The complaints on the questionnaires are grouped in categories related to specific body-parts, organs and bodily systems. These categories are: "Sleeping problems", "Energy problems", "Bowel/abdomen problems", "Ear, nose and throat problems" and "Skin problems". The questionnaire provides room for comments and includes a blank category named "Other problems" to report any other complaints that were not included in the list.

Three months, or 13 weeks, after the beginning of the treatments, again, the same questionnaire <sup>45</sup> was filled out to assess the frequency of occurrence of the complaints of the individual. The questionnaires were filled out by the parents or guardians of the child or adolescent.

The Biophoton Therapy treatments all took place in the first 2 weeks of the 13-week period. The personalised treatments are determined by measurement <sup>46</sup> with the 'Biophoton Therapy Device by J. Boswinkel', where after the actual treatment is also given through the 'Biophoton Therapy Device by J. Boswinkel'.

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<sup>43</sup> See appendix I for the questionnaire.

<sup>44</sup> When a complaint occurs more frequently the impact on the quality of life increases.

<sup>45</sup> See appendix II for this second questionnaire.

<sup>46</sup> Measurement consists of the determination of disturbances. See section 1.1.6.

With every individual, a first measurement and treatment was executed right after the first questionnaire was filled out. Seven days after the first treatment, a measurement was performed to determine if there were no longer any disturbances present. If necessary, a second personalised treatment was given.

If a second treatment was given, a third measurement followed, 14 days after the first treatment. And if necessary, a third personalised treatment was given.

The only method of treatment is done with an instrument, the 'Biophoton Therapy Device by J. Boswinkel'. Two fibreglass cables will be connected to the instrument on one end and two quartz glass tubes or quartz glass plates to the other end. The individual receiving treatment will hold these glass tubes in his or her hands or will place his or her bare feet on the glass plates. In the most common way of treatment of an individual with the 'Biophoton Therapy Device by J. Boswinkel', first there will be a measurement through the 'Biophoton Therapy Device by J. Boswinkel', secondly one or more programs will be ran while the treated individual is holding the glass tubes in his or her hands and after that a last program will be ran while the individual is holding his or her bare feet on the glass plates. Other than holding the glass tubes or placing the feet on glass plates, there will not be any physically tangible treatment, such as drugs, herbs or any other substances.

All measurements and treatments on all cooperating children and adolescents were performed by both authors together. Both authors will focus on a different research question.<sup>47</sup> As a result, one author<sup>48</sup> will look into the results of all 20 cooperating children and adolescents. The other author<sup>49</sup> will focus on a subgroup of 11 children and adolescents, of which the parents or guardians of these individuals reported that the experienced complaints might be due to a food hypersensitivity that has been diagnosed by a medical doctor.

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<sup>47</sup> Refer to section 1.3.

<sup>48</sup> Ellen Pet-Reatsch

<sup>49</sup> Wim Pet

To differentiate between incidental complaints and chronic complaints, and to define, in the first four criteria, what is meant in this study as a "chronic complaint among children", we will use the following inclusion criteria:

- The complaint occurs with children and adolescents up to and including 18 years of age.
- The complaint interferes with the child's normal daily routine(s).
- The complaint can be self-identified and is not (per se) based on a medical diagnosis.
- The complaint occurs frequently, i.e. daily or at least several times a week. The complaint had lasted for 3 months or a longer period of time already.
- The child is not using any drugs and is (currently) not under treatment of a medical doctor.

On the questionnaire, the possible answers to the frequency of occurrence of the complaints are: "never", "sometimes", "regularly", "often" and "always". Complaints that are only experienced "sometimes" are interpreted as complaints that occur on an irregular basis and thus as incidental complaints.

## 2.2 Participants

This study was performed by:

Ellen Pet-Reatsch, measurement and treatment with 'Biophoton Therapy Device by J. Boswinkel'.

Wim Pet, measurement and treatment with 'Biophoton Therapy Device by J. Boswinkel'.

Participating individuals of this study are 20 children and adolescents, their parents or guardians. Statistical analysis was performed by C.G. de Jonge, University of Leiden.

## 2.3 Materials

Biophoton Therapy Device, developed by dr. J. Boswinkel.

Questionnaires to determine the complaints of the cooperating children or adolescents before and after Biophoton Therapy, these forms are added in appendix I and appendix II.

## 2.4 Statistical analysis

Statistical analysis was conducted by an independent person who had no extensive prior knowledge of the main subjects of this research. The questionnaires that were filled out before the treatments were compared to the questionnaires gathered after treatment.

A matched sample t-test was used to determine whether there was statistically significant improvement in the before and after frequency of the complaints. The p-value reported with a t-test represents the probability of error associated with rejecting the null hypothesis, i.e. the hypothesis that the treatment has no effect.

Using the matched sample t-test on the total group, the p-value reached statistical significance at  $p < .00003$ . For the food hypersensitivity subgroup, whose parents or guardians stated that their complaints were a consequence of a diagnosed food hypersensitivity, the p-value reached statistical significance at  $p < .0008$ .

### 3. Results

From a total of 20 children and adolescents whose questionnaires were analysed, a total of 133 complaints met the outlined inclusion criteria. The reasons for exclusion were that the complaint did not occur frequently enough to be called a chronic complaint or that the self-reported complaints, under "other problems"<sup>50</sup>, were no complaints in the strict sense, but for example the name of a disease.

All of the results presented below follow from the comparison of the questionnaires that were filled out before the treatments and the questionnaires gathered 13 weeks after the first treatment.

#### 3.1 Survey

The group of 20 children and adolescents, of which 40% were female and 60% were male, began the treatment with an average of 6.7 chronic complaints per individual. The average age of the group was 9.5 years old and they received an average of 2.55 treatments per individual.

Of all 133 chronic complaints, 92.5% of the chronic complaints were resolved. This means that after treatment the complaint did not occur anymore, or, in some cases, not frequently enough to count as a chronic complaint according to the criteria of a chronic complaint used in this study.<sup>51</sup> Of the chronic complaints that were not entirely resolved, the majority did improve in the sense that the complaint occurred less frequent than before the treatment. Of all 133 chronic complaints, 97.0% improved in their frequency of occurrence.

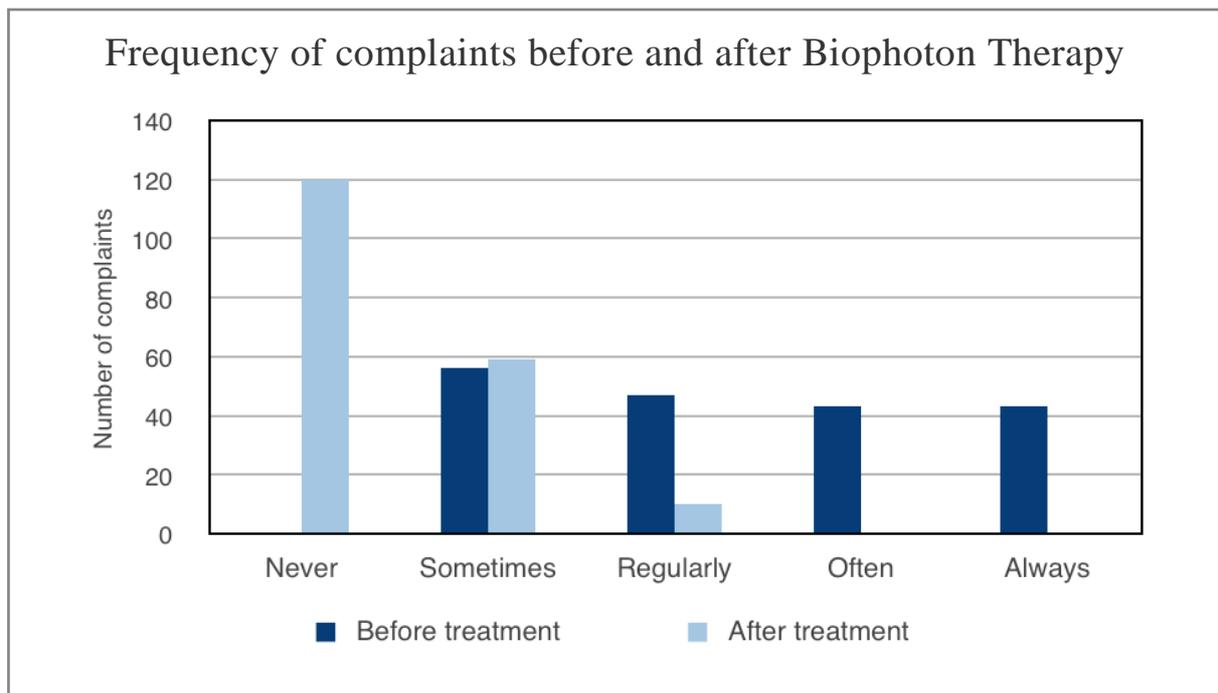
Total number of treated chronic complaints	133
Average number of chronic complaints per child	6.7
Average age of total group	9.5
Percentage of female	40.0%
Percentage of male	60.0%
Percentage of chronic complaints improved	97.0%
Percentage of chronic complaints resolved	92.5%

<sup>50</sup> See appendix I for the questionnaire

<sup>51</sup> See chapter 2.1

After treatment with Biophoton Therapy, the parents or guardians of the children and adolescents were asked again to fill out the questionnaire and to rate the frequency of occurrence of the complaints.

Of the 133 chronic complaints that existed before treatment, 10 complaints persisted after treatment. That amounts to an average of 0.5 chronic complaints per individual after treatment. Below, an overview is presented of all the answers that were filled out about the complaints of the cooperating children and adolescents.



**Figure 3.** Frequency of occurrence of all complaints before and after Biophoton Therapy

The complaints on the questionnaires are grouped in categories related to specific body-parts, organs and bodily systems. These categories are: "Sleeping problems", "Energy problems", "Bowel/abdomen problems", "Ear, nose and throat problems" and "Skin problems". Any other complaints that the parents or guardians reported were filed under "Other problems"<sup>52</sup>.

	Occurring chronic complaints	Percentage resolved
Sleeping problems	18	100.0%
Energy problems	26	88.5%
Bowel/abdomen problems	18	100.0%
Ear, nose and throat problems	25	88.0%
Skin problems	15	93.3%
Other problems	31	90.3%
<b>Total of problems</b>	<b>133</b>	<b>92.5%</b>

### 3.2 Food hypersensitivity subgroup

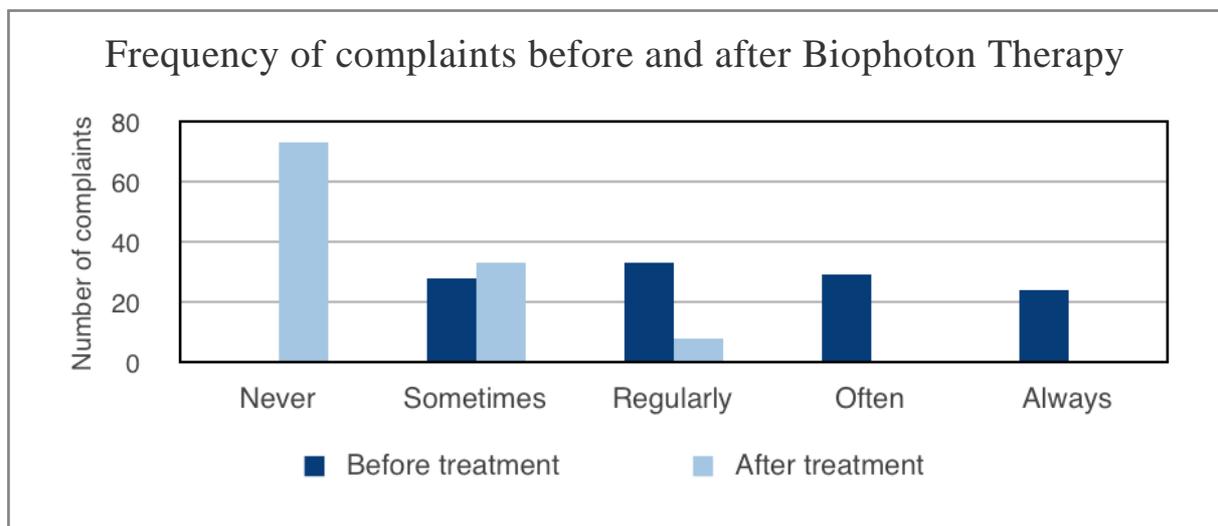
The food hypersensitivity subgroup consisted of 11 children and adolescents whose parents or guardians stated that their complaints were a consequence of a diagnosed allergic or non-allergic food hypersensitivity. Among those 11 children and adolescents, 86 chronic complaints were reported that met the inclusion criteria. Of this subgroup, 54.5% were female and 45.5% were male. They had an average age of 7.9 years old and began the treatment with an average of 7.8 chronic complaints. The children and adolescents received an average of 2.64 treatments per individual.

Of the 86 chronic complaints among the 11 children and adolescents, 95.3% of the complaints improved in their frequency of occurrence and 90.7% of the chronic complaints were resolved after treatment.

<sup>52</sup> Other problems that were reported include: atychiphobia, poor appetite, dry irritated eyes, excessive sweating, introversion, underweight despite good appetite, tantrums, dry skin, hypersensitivity to odours, dexterity problems, nervousness, neck pain etc.

Total number of treated chronic complaints	86
Average number of chronic complaints per child	7.8
Average age of the subgroup	7.9
Percentage of female	54.5%
Percentage of male	45.5%
Percentage of chronic complaints improved	95.3%
Percentage of chronic complaints resolved	90.7%

Of the 86 chronic complaints that existed in the subgroup before treatment, eight complaints persisted after treatment. That amounts to an average of 0.7 chronic complaints per individual after treatment. Below, an overview is presented of all the answers that were filled out about the complaints of the cooperating children and adolescents.



**Figure 4.** Frequency of occurrence of all complaints of the food hypersensitivity subgroup before and after Biophoton Therapy

The number of chronic complaints per category before Biophoton Therapy, and the percentages of chronic complaints that were resolved after Biophoton Therapy can be seen in Table 4.

<b>Table 4. Percentages of chronic complaints resolved</b>		
	Occurring chronic complaints	Percentage resolved
Sleeping problems	13	100.0%
Energy problems	15	80.0%
Bowel/abdomen problems	13	100.0%
Ear, nose and throat problems	15	80.0%
Skin problems	9	100.0%
Other problems	21	90.5%
<b>Total of problems</b>	<b>86</b>	<b>90.7%</b>

### 3.3 Special observations

Among a number of children who belong to the same family and where a medical doctor had found that the complaints were related to food hypersensitivity, measurement<sup>53</sup> revealed a disturbance of formalin. Once the disturbance was treated through Biophoton Therapy and where after it was no longer measurable as a disturbance of formalin, the chronic complaints disappeared immediately. Even if the children ingested foods that before triggered the complaints, none of the adverse reactions came back.

Another child, suffering from gluten intolerance<sup>54</sup>, continued to develop a wide range of chronic complaints despite a gluten-free diet. Measurement with the 'Biophoton Therapy Device by J. Boswinkel' unveiled several disturbances on the immune system, including a disturbance due to nickel. After Biophoton Therapy treatment, these symptoms disappeared within three days. Again, in this case, we saw that the problem initially seemed to be food-related, but the complaints persisted even after elimination of the relevant nutrients.

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<sup>53</sup> Measurements were done with the 'Biophoton Therapy Device by J. Boswinkel'. Refer to section 2.1 and section 1.1.6.

<sup>54</sup> Gluten intolerance, or coeliac disease, is now actually classified as a non-IgE mediated food allergy since the World Allergy Organisation issued a report of revised nomenclature in 2003.

With another child, a severe allergy of cow's milk was extant. Upon contact with cow's milk, the child would go into an anaphylactic shock immediately. A variety of disturbances were found on the immune system. In this case, disturbances due to streptococcus and listeriosis. After having treated these disturbances with Biophoton Therapy, where after they were no longer measurable, the child tolerated all dairy products in the quantities she desired.

Without having conducted further research, it appears that there may be other underlying causes that may induce adverse reactions and complaints after ingestion of certain foods with children who were diagnosed by a medical doctor, as having food-allergy or food-intolerance.

## 4. Discussion

### 4.1 Interpretation of results

Chronic complaints among children and adolescents, including those related to food hypersensitivity, are extremely common. With reports of prevalence stating that 14 to 20 percent of children are suffering from chronic disorders, their experienced complaints will inevitably affect their quality of life.<sup>55</sup>

In this study among 20 children and adolescents, the individuals suffered from an average of 6.7 complaints that occurred regularly to always. The food hypersensitivity subgroup consisted of 11 children and adolescents whose parents or guardians stated that their complaints were a consequence of a diagnosed allergic or non-allergic food hypersensitivity. This subgroup began the treatments with an average of 7.8 chronic complaints. Those multitudes of complaints thus affect a variety of aspects of their quality of life.

Biophoton Therapy was shown to be effective in eliminating the majority of complaints in the group of 20 individuals. After 13 weeks, 97.0% of the complaints that were treated showed improvement in their frequency of occurrence. Among the food hypersensitivity subgroup, consisting of 11 children and adolescents, 95.3% of the treated complaints decreased in frequency of occurrence. Because the vast majority of complaints did not occur anymore and the remainder of the complaints decreased in frequency of occurrence, inevitably this improved the quality of life of the individuals that were treated.

That the treatment had a positive influence on the quality of life of the treated children and adolescents was also illustrated by the reactions of the parents. To illustrate an example of such a reaction, a part of a letter, sent to us by one of the parents, is quoted below. The letter was about her 11 years old daughter, who was diagnosed with Raynaud's syndrome<sup>56</sup> and furthermore had a serious learning disability.

*"Before she started with the treatment she couldn't read or recognise a single letter. After two weeks of treatment, her teacher called with the question what we have done with the old L. She suddenly had started reading and could recognise all letters."*

With this child, the frequency of occurrence of the complaint "bad concentration", that can be found in the category "Energy problems" of the questionnaire, changed from "always" before treatment to "sometimes" after treatment. In the category "Other problems", the self-reported complaint "inability to read" improved from "always" before treatment, to "never" after treatment.

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<sup>55</sup> See chapter 1.2.3

<sup>56</sup> General information on Raynaud's Syndrome on Wikipedia: [http://en.wikipedia.org/wiki/Raynaud's\\_syndrome](http://en.wikipedia.org/wiki/Raynaud's_syndrome)

## 4.2 Conclusions

The results of this observational study show that Biophoton Therapy decreases the frequency of chronic complaints and chronic complaints that are possibly associated with allergic and non-allergic food hypersensitivity.

97.0% of the chronic complaints, among all 20 treated children and adolescents, improved for the better in their frequency of occurrence. 92.5% of the chronic complaints did never occur anymore or only occurred sporadically, and therefore these complaints could not be classified as a chronic complaint. These figures include the 11 children and adolescents that were diagnosed with an allergic or non-allergic food-hypersensitivity. Among the subgroup of 11 individuals that suffered from diagnosed food-hypersensitivity, 95.3% of the complaints decreased in their frequency, and 90.7% of the chronic complaints were totally resolved or reduced to only occur sporadically.

The interpreted results show that treatments given with the 'Biophoton Therapy Device by J. Boswinkel' have an actual noticeable positive influence on the quality of life of children and adolescents that suffer from chronic complaints.

## 4.3 Self-critical remarks

This study can not be compared to a full-scale clinical trial in which an intervention is investigated under controlled conditions. Instead, a group of individuals that suffered from chronic complaints participated in an observational study in natural settings.

This study is aimed to be a first step to investigate if there is an influence of Biophoton Therapy on chronic complaints among children and adolescents and the possible improvement on their quality of life.

Seven children in the subgroup, thus also in the total group, belong to the same family and live together in the same residence. The similarities in the disturbances, and thus in the treatments, may have an influence on the results, because of the possible limitation in the variety of the nature of the symptoms.

In this study, we have not examined the severity of the symptoms. Instead, the frequencies of occurring complaints are examined and can be interpreted as a measure of degree of severity. The frequency of occurrence of the complaints among the children and adolescents serve as a measure of the quality of life.

It has to be stressed that the results of this study can be due to the Biophoton aspect of Biophoton Therapy intervention, but may in part be due to the psychosocial context of the treatment situation.

## 4.4 Suggestions for further research

Although this research was conducted over a relative short period of time of 13 weeks and among a relatively small group of children and adolescents, the p-value of  $p < .00003$  indicates that the results of the research are statistically significant. A larger research project, among a larger group of individuals is desirable. And to assess the effects over a longer period of time, further research could be done where the progress of the cooperating individuals is assessed at a regular interval. Of course, this research can be expanded to include adults.

It may also be interesting not only to look at the quality of life, but also to see if Biophoton Therapy affects the symptoms diagnosed by medical doctors.

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## Appendix I

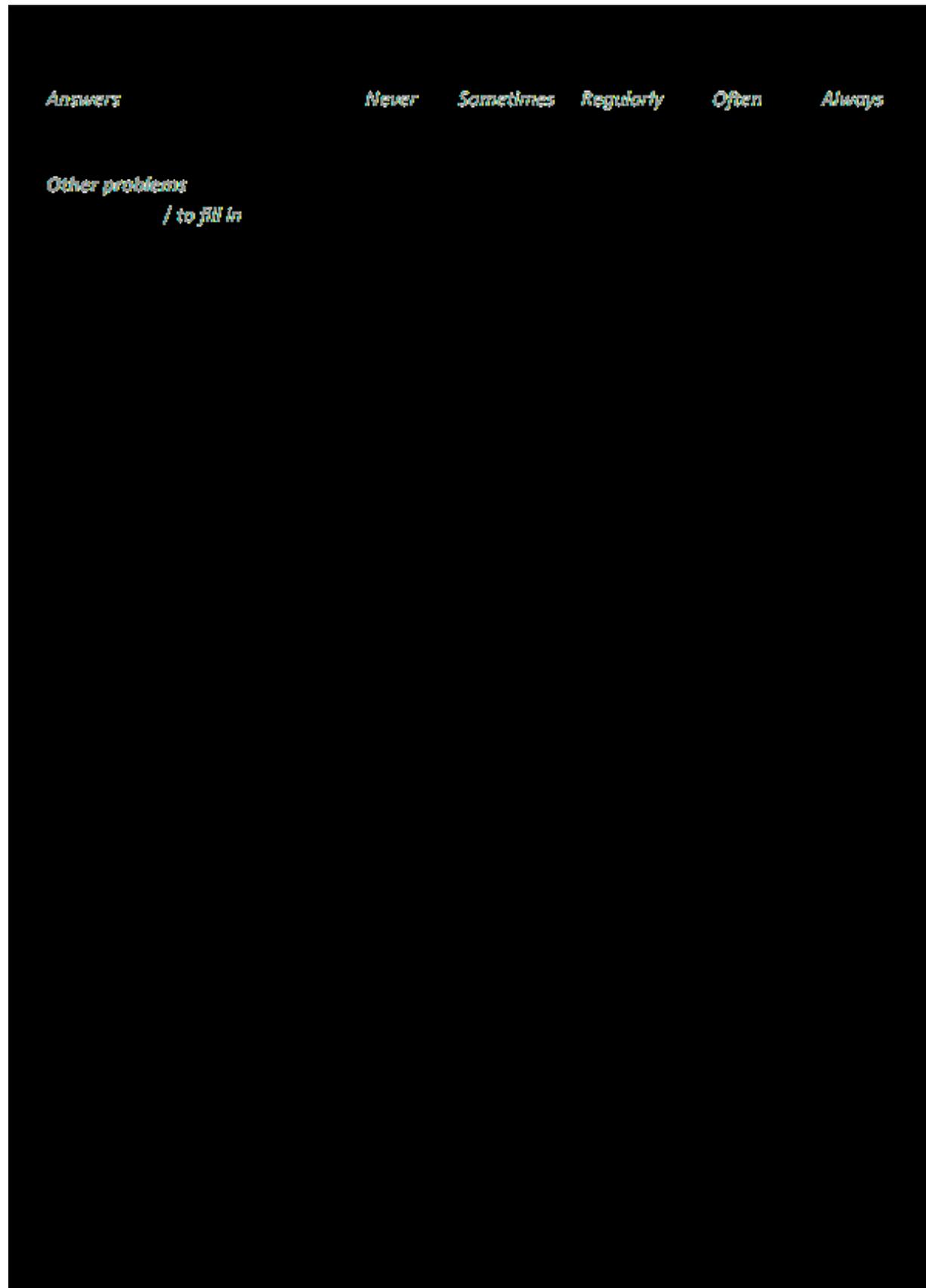
*This questionnaire refers to a concept of man and of health used in the author's line of integrated health care. Thus, some links between categories and subcategories may seem unfamiliar to the concepts of mainstream medicine.*

*Which of the following complaints does your child have on a regular basis?*

*Up to now, before the beginning of treatment*

<i>Answers</i>	<i>Never</i>	<i>Sometimes</i>	<i>Regularly</i>	<i>Often</i>	<i>Always</i>
<i>Sleeping problems</i>					
<i>sleeping restless</i>					
<i>sleeping bad</i>					
<i>sleeping too much</i>					
<i>sleeping too little</i>					
<i>bedwetting</i>					
<i>Energy problems</i>					
<i>tired</i>					
<i>dizzy</i>					
<i>lifeless</i>					
<i>bad concentration</i>					

<i>Answers</i>	<i>Never</i>	<i>Sometimes</i>	<i>Regularly</i>	<i>Often</i>	<i>Always</i>
<i>tics</i>					
<i>headache</i>					
<i>Bowel/abdomen problems</i>					
<i>abdominal pain</i>					
<i>diarrhea</i>					
<i>constipation</i>					
<i>Ear, nose and throat problems</i>					
<i>suffocation</i>					
<i>ear pain</i>					
<i>throat pain</i>					
<i>common cold</i>					
<i>deafness</i>					
<i>coughing</i>					
<i>Skin problems</i>					
<i>red spots</i>					
<i>itch</i>					
<i>rash</i>					
<i>eczema</i>					



*/ Comments*

*Thank you very much for answering this question!*

## Appendix II

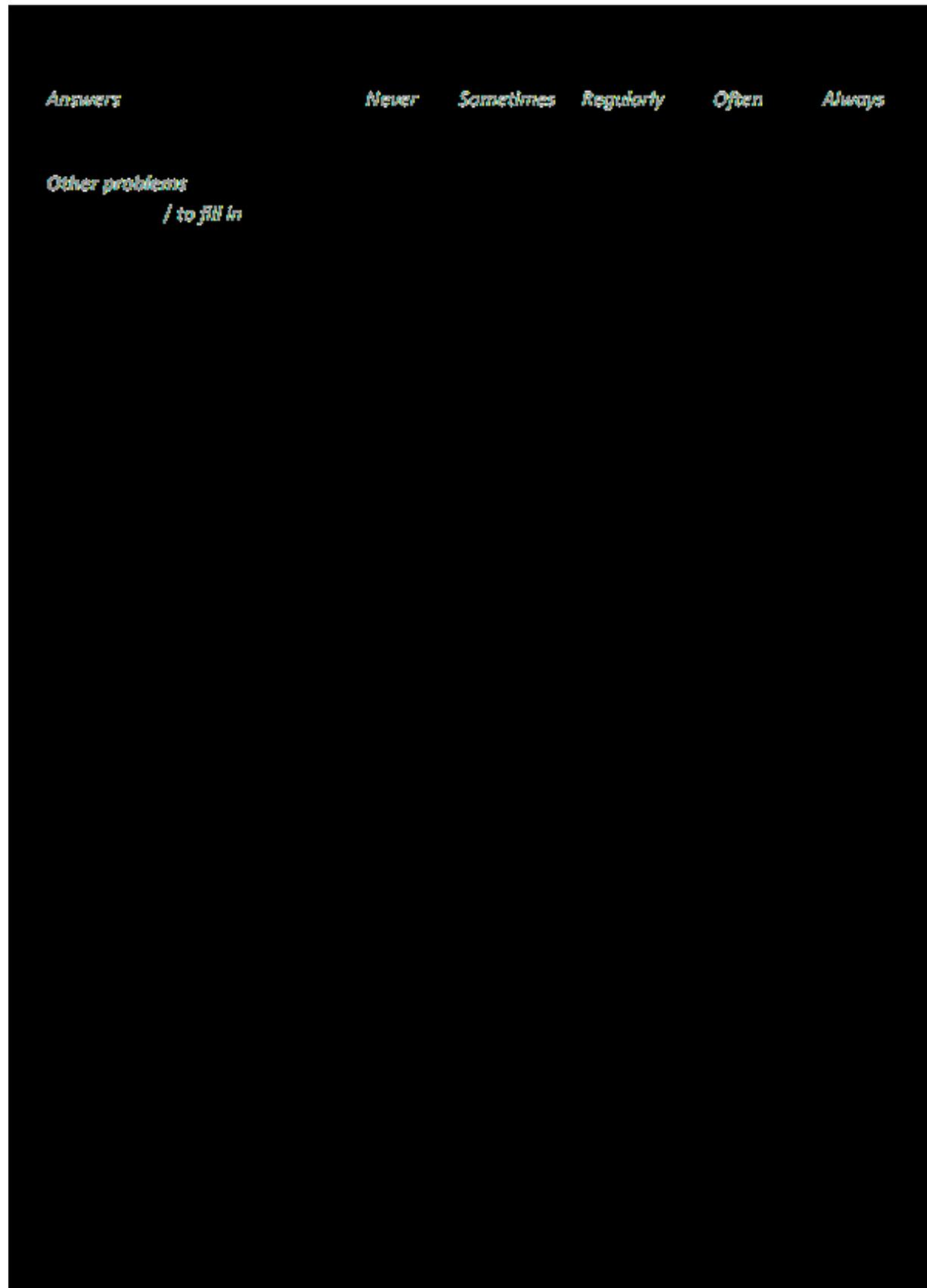
*This questionnaire refers to a concept of man and of health used in the author's line of integrated health care. Thus, some links between categories and subcategories may seem unfamiliar to the concepts of mainstream medicine.*

*Which of the following complaints does your child have on a regular basis?*

*Since the beginning of the treatment*

<i>Answers</i>	<i>Never</i>	<i>Sometimes</i>	<i>Regularly</i>	<i>Often</i>	<i>Always</i>
<i>Sleeping problems</i>					
<i>sleeping restless</i>					
<i>sleeping bad</i>					
<i>sleeping too much</i>					
<i>sleeping too little</i>					
<i>bedwetting</i>					
<i>Energy problems</i>					
<i>tired</i>					
<i>dizzy</i>					
<i>lifeless</i>					
<i>bad concentration</i>					

<i>Answers</i>	<i>Never</i>	<i>Sometimes</i>	<i>Regularly</i>	<i>Often</i>	<i>Always</i>
<i>tics</i>					
<i>headache</i>					
<i>Bowel/abdomen problems</i>					
<i>abdominal pain</i>					
<i>diarrhea</i>					
<i>constipation</i>					
<i>Ear, nose and throat problems</i>					
<i>suffocation</i>					
<i>ear pain</i>					
<i>throat pain</i>					
<i>common cold</i>					
<i>deafness</i>					
<i>coughing</i>					
<i>Skin problems</i>					
<i>red spots</i>					
<i>itch</i>					
<i>rash</i>					
<i>eczema</i>					



*/ Comments*

*Thank you very much for answering this question!*