# Nursing needs categorized into nursing diagnoses according to NANDA observed in a primary health-care setting in Bangkok, Thailand.

A quantitative observational study

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# Abstract

**Background:** Lifestyle related non-communicable diseases are now the biggest cause of death and burden of disease in Thailand. NANDA is an evidence- based classification system of nursing diagnosis.

**Aim:** The purpose of the study was to identify and describe the nursing needs of a patient group from a low socio- economic background located in an urban primary health-care setting in Thailand by using NANDA.

**Method:** The study is a structured observation study with a quantitative approach. The study was conducted at a health- center in Bangkok, Thailand

**Result:** 42 different NANDA diagnoses were identified in the observed group. In total 609 nursing diagnoses were distributed among 96 patients of which 76 were women. The most frequent nursing need diagnosis found was; *Imbalanced nutrition; more than body requirement*. The most frequent nursing risk diagnosis identified was: *Risk for decreased cardiac tissue perfusion*.

**Conclusion:** The nursing needs observed in the patient group were mainly related to non-communicable diseases. The disease panorama observed in the patient group coherent with findings in international modern research. Significant relationships and patterns between nursing needs could be identified which strengthens the idea of using an instrument such as NANDA. In conducting the study it was evident that some nursing problems did not match with any diagnosis in the NANDA taxonomy.

**Clinical impact:** The study shows the nursing needs among a patient group with low-socio economic backgrounds in an urban primary health care setting in Bangkok. NANDA is a good tool to systematize nursing care in the nursing profession. It can be beneficial for students in similar situations to use a tool like NANDA to categorize their assessments and impressions.

**Keywords:** NANDA, Thailand, primary health-care, non-communicable diseases, low socio-economic background

# SAMMANFATTNING

**Bakgrund:** Livsstil relaterade icke-smittsamma sjukdomar är numera den största dödsorsaken och sjukdomsbördan i Thailand. NANDA är en evidensbaserad klassificeringssystem av omvårdnad diagnos.

**Syfte:** Syftet med studien var att beskriva och identifiera omvårdnadsbehov hos en patientgrupp med låg socioekonomisk bakgrund inom primärvården i Bangkok genom att använda NANDA.

**Metod:** Studien är en strukturerad observationsstudie med en kvantitativ ansats. Studien genomfördes på en primärvårsinstans i Bangkok.

**Resultat:** 42 olika NANDA diagnoser identifierades i den observerade gruppen. Totalt fördelades 609 diagnoser på 96 patienter, varav 76 var kvinnor. Vanligaste omvårdnadsdiagnosen var *Obalanserad kost, mer än kroppsbehovet*. Den vanligaste omvårdnads riskdiagnosen identifierad var *Risk för minskad hjärtvävnads perfusion*.

**Slutsats**: Omvårdnads behovet i den observerade patient gruppen var främst relaterat till icke smittsamma livsstilsrelaterade sjukdomar. Sjukdomspanoramat i den observerade patientgruppen var i överensstämmelse med resultat i internationell modern forskning. Att använda NANDA visade sig vara använbart för att organisera och systematisera observationer och data oavsett sammanhang. Signifikanta samband och mönster mellan olika omvårdnadsbehov kunde identifieras. Ett antal identifierade omvårdnadproblem matchade inte med någon diagnos i NANDA taxonomin.

**Klinisk betydelse:** Studien visar på omvårdnadsbehovet hos en patientgrupp med låg socioekonomisk bakgrund i en urban primärvårdsinstans i Bangkok. NANDA är ett bra verktyg för att systematisera omvårdnad i sjuksköterskeyrket. Det kan vara fördelaktigt för studenter i liknande situationer att använda ett verktyg som NANDA att kategorisera sina bedömningar och intryck.

**Nyckelord:** NANDA, Thailand, primärvård, icke-smittsamma sjukdomar, låg socioekonomisk bakgrund

# INDEX

# INTRODUCTION

As student nurses from the Red Cross University College of Sweden, we were given the opportunity to participate in the Linnaeus- Palme student exchange program in Bangkok for three months. During the exchange program we had one clinical placement in the primary health-care sector in Bangkok. Before leaving Sweden we knew that we were going to make observations at a health center and during home visits to people in a low socio- economic area. To prepare for the exchange program we search for articles and other relevant literature about the actual situation in Thailand such as public health and economy. This aroused our interest to investigate the nursing needs in the patient group that we were going to meet. According to the literature search, we could not find much literature that was in relevance to the subject area as well as Thai primary-health care or patients in primary health care with a low-socio economic background. To convert our impressions and experiences of patients' needs in a foreign culture, we considered it valuable to utilize an internationally valid catalogue of nursing diagnoses to categorize our impressions. In that way the disease panorama could become more comprehensible as well as comparable with Swedish circumstances and a deeper understanding for differences and similarities could be achieved. The result of this study is the data gathered by observing the patients we met at the local health center.

## BACKGROUND

## Thailand

Thailand is a Buddhist monarchy at Southeast Asian peninsula, bordering Burma, Laos, Cambodia, and Malaysia. Buddhism is very present in the Thai culture and society. Thailand is the only country in Southeast Asia that has never been colonized. The country has in a few decades transformed itself from an agricultural nation to export-orientated industrial nation (Utrikespolitiska institutet, 2010). Thailand is today categorized by the World Health Organization (2011) as a lower middle income country with a well-developed infrastructure (ibid.). The population in 2012 was approximately 69, 9 million with 5.8 million in the capital, Bangkok. The life expectancy is 66 years for men and 74 years for women (Mårtensson, 2013). The prevalence of HIV/AIDS is 1.3 percent among adults between 15 to 49 years. This is one indicator in mortality and the burden of disease where Thailand has an inferior outcome compared to the average in the South-East Asia region (WHO, 2009). In the majority of the epidemiological data of public health status, Thailand is now far ahead of its neighboring countries. For example, in respect of the maternal mortality ratio, child mortality rate, access to clean water, and the levels of overall poverty, the data from Thailand is more similar to Sweden than Cambodia. Interestingly, Turkey is a European country to which Thailand is highly comparable with in many social indicators (see Attachment 1).

In a trend directly related to economic development and lifestyle changes over the past 20 years, non-communicable diseases such as cardiovascular disease, diabetes, and cancer have become the leading causes of illness and death in Thailand (Lyttleton, 2004). The presence of metabolic risk factors is high, a total of 56.1 percent of the population suffer from hyper cholesterol, 32.2 percent are overweight, 8 percent are obese, 7.3 percent have DM II (type 2 Diabetes Mellitus), and 34.3 percent have hypertension (WHO, 2009) (see attachment 1). The rapid economic development has given the majority of Thai people better living conditions and the poverty rate has declined significantly. For example in 2009 less than 5 percent of the population lived under the poverty line (US$ 2/ day) and 0,37 percent under the extreme poverty line (US$ 1.25/ day). Thailand's most rapid rate of economic growth has been mainly concentrated in Bangkok and the immediately surrounding region. As a result there

2

has been a significant widening in the difference in wealth between various parts of the country (Mårtensson, 2013).

**Health-care in Thailand**

Health-care in Thailand is mainly managed by the public sector, but private health-care has increased in the cities along with the growing middle class. Since 2001 all citizens have access to a unified medical fee on approximately 30 baths (equivalent to US$1) per visit. Basic preventive health-care such as personal hygiene, clean water, and vaccinations has for many years been an important factor in the Thai health-care system. One simple and particularly important factor is that today 98 percent of the population has access to clean water (Utrikespolitiska institutet, 2010).

Thais can choose between public and private health-care, and they can also choose if they want to go for treatment to a specialist, a hospital or health center (Pongsupap & Van Lerberghe, 2006). The Thai health-care system is broadly divided into three levels: primary, secondary, and tertiary care. Primary health-care work is concerned with basic treatments including general health promotion, disease, and illness prevention, treatment of common health problems, rehabilitation as well as palliative care (Hanucharurnkul, 2007). This primary health-care system, the first medical service level provided by health personnel was, in 2008, made up of 9,762 health centers and 5,946 primary care units (Department of Mental Health, 2008). In Bangkok itself, primary health-care is provided normally in the outpatient departments (OPD's) of local hospitals but outpatient health-care can also be seen in health centers (Pongsupap & Van Lerberghe, 2006).

The important role played by health-care volunteers in the Thai primary health-care sector is revealed by the large numbers involved. In 2006 there were 831,774 volunteers working in 69,331 communities (Department of Mental Health, 2008). Thanks to the volunteers, health promotion and disease prevention have been spread widely to the benefit of people even in remote villages and communities all over the country (Treerutkuarkul, 2008).

**The Health Center 55**

The health center 55 is a small primary health-care unit situated in the district of Yannawa in central Bangkok. According to Mrs Rungnapa Manjaian (personal communication, 19 February 2013), the head nurse at the health center, the unit is one of 68 similar public nonprofit primary health-care centers in the city. About 90 percent of the patients come from slum communities with low socio-economic backgrounds. The District of Yannawa, the clinic's area of responsibility has an area of nearly 10 square kilometers and a population numbering approximately 54,185. Mrs Rungnapa Manjaian states that the area of responsibility is divided into 28 communities, of which several are very deprived. The district has 13 schools, over 300 factories, 100 residential towers, 3 Buddhist temples, 1 mosque, 2 churches, and 2 markets. Throughout the communities there are representative volunteer health workers and smaller health-care facilities equipped with general medical first aid (ibid.).

The health center has a reception, various examination rooms, and a small pharmacy situated on the ground floor, a dental care surgery on the second floor, and offices on the third. In the health center there are two general medical practitioners, one gynecologist, five community health nurses, three outpatient department nurses, two school nurses, several assistants, a pharmacist and assistant, and two social workers. A number of volunteers, who are responsible for their respective communities, also help out at the health center (Mrs Rungnapa Manjaian, personal communication, 19 February 2013).

Mrs Rungnapa Manjaian (personal communication, 19 February 2013) explains that in the mornings the health center receives patients coming for both unscheduled and for scheduled follow-up visits. The activities in the health center mainly amount to general health checkups, wound dressing, blood chemistry, screening for hypertension, and DM II, health promotion, renewal of prescriptions as well as collection of new medication. Furthermore she expresses that in the afternoon the health center functions as a different clinic each day. For example, it operates as a basic antenatal clinic for pregnant woman once a week and a child care center twice a week. There is also a family planning clinic every Wednesday, where women may drop in for gynecological examination, advice, and contraceptives (ibid.).

According to Mrs Rungnapa Manjaian (personal communication, 19 February 2013) some patients and their families are visited regularly at home by a nurse from the health center. The purposes of such visits are usually to follow-up and review the home situation as well as to check on medication compliance and rehabilitation of the patient. Blood pressure, blood glucose, and nursing interventions such as urinary catheter replacements are performed. The nurse does not perform basic nursing interventions as these are always managed by family members themselves. Mrs Rungnapa Manjaian explains that three particular areas are most frequent visited; these being slum communities. Mongkolsmai (2001) explains that the slum areas such as these are usually either set on temple land, private land with a rental agreement or encroached governmental land. There are approximately 770 squatted communities located in Bangkok. The district of Yannawa in which the health center is located has 35 squatted communities, the largest number of all districts in the city (ibid.). The three communities most often visited by the staff from the health center are called Chonglom with 600 families living there, Klongkwang that has approximately 500 families and Chuer Plerng Pattana Community with 500 (Mrs Rungnapa Manjaian, personal communication, 19 February 2013). According to Mongkolsmai (2001) Chuer Plerng Pattana Community is one of the oldest squatter communities and is set on encroached governmental land. In 1981 the community got it first informal community and with involvement from the Norwegian Save the Children organization, registration of housing units and improvement of community conditions was achieved. Permanent wooden walkways, electricity supplies, and a public water system were also installed. In 1985 the community board was accepted by the Yannawa municipality and that process led to further development of the community infrastructure including permanent concrete walkways, water systems for each housing unit, maintained drainage, and provision to firefighting services (ibid.).

## The Nursing Process

The Nursing Process is a problem solving model and a decision making model that is used to identify needs, problems, and resources to individually adapt nursing interventions for the patient (NANDA, 2012). Each part of the Nursing Process is imbued with a critical attitude: it is a theoretical framework for nursing rooted in the

general systems theory, introduced in the 1930's by von Bertalanfly. Later, in the 1950's, Lydia Hall presented the Nursing Process as a model for nurses' critical thinking and in 1973 the ANA (The American Nurses Association) described the Nursing Process as five phases: data collection, diagnoses, planning, implementation, and evaluation. The Nursing Process provides a basis for nursing incorporating prevention and health promotion. The purpose of the process is to adapt nursing care based on the individual needs and a way to increase patient comfort in interaction with the environment (Florin, 2009).

**Data collection**

Florin (2009) describes that the first phase of the Nursing Process involves gathering data about the patient's current and past health conditions. This data is the source for the creation of diagnoses. Data collection can be done by talking to the patient and/or to their relatives, by physical examination, by previous documentation but also through the assessment from other professions. Data collection often involves a combination of subjective and objective data. Measurable objective data is usually collected through a physical examination such as blood sampling, weight or respiratory rate. Subjective data are the symptoms of an illness expressed by the patient. In order for the quality of the information to be as good as possible, there are many factors at play. An important aspect is that the nurse in meeting with the patient manages to create an honest and trustworthy contact (ibid.)

**Nursing diagnoses**

Nursing diagnoses belong to the second phase in the Nursing Process. A common perception is that the diagnoses are associated only with medical doctrine. In fact, the word diagnosis comes from Greek and is an expression of *the art of distinguishing*. With all the information gathered in the meeting with the patient, the process begins in which the patient's health status, its strengths and its weaknesses are identified. The data about the patient is then analyzed and tested and diagnoses are set (Florin, 2009).

## NANDA

NANDA taxonomy is an international evidence-based classification system of nursing diagnoses that was developed by the North American Nursing Diagnosis Association. The association started the work with the taxonomy in 1973 and since then it has grown and due to an increased international interest in nursing terminology the NANDA taxonomy has been translated into several languages (NANDA, 2012).

According to NANDA (2012) must each nursing diagnosis which is accepted as a part of the NANDA taxonomy have support of scientific evidence and proven experience. A constant review of already existing and new diagnoses is being performed by a special research group. NANDA diagnoses are built according to the PES model. The PES structure model is used to formulate nursing diagnoses internationally. PES stands for problem (P), its causes or etiologies (E), and symptoms (S). The nursing diagnoses describe a causal relationship by identifying the cause and the problems it has led to. The purpose with its design is that by this formulation it also leads the thoughts further in the nursing process and the problem solving. The NANDA classification system contains about 200 diagnoses, which are divided into 13 domains and 47 classes. Some diagnoses can be placed in multiple domains and classes. All diagnoses contain a definition and a code so it easily can be found in the database. Nursing need diagnoses includes defining characteristics and related factors. The nursing risk diagnoses contain risk factors only (ibid.).

Studies show that there are many benefits of the use of nursing diagnoses. Among other things there is a significant improvement in patient documentation after the introduction of a standardized nursing diagnostic system (Müller-Staub, Lavin, Needham & van Achterberg, 2006; Thoroddsen & Ehnfors, 2007; Axelsson, Björvell, Mattiasson & Randers, 2006). Using classified nursing diagnoses has been shown to be very useful for scientific research purposes as well as the design and evaluation of guidelines and policies (Axelsson, Björvell, Mattiasson & Randers, 2006).

Lai, Chao, Yang, Liu and Chen (2013) interviewed nursing professionals in Taiwan to get a better understanding on how useful NANDA nursing diagnoses are in a health-care system that differs from the North American. Taiwan as well as many other Asian

countries has a modernized health-care system but with influence of traditional medicine. The Taiwanese nurses experienced an impaired ability to have a holistic and balanced patient view in nursing care when using NANDA nursing diagnoses. One problem was the cultural conflict that occurred between the Western and the Chinese traditional health-care values in the Taiwanese health-care. Lai, Chao, Yang, Liu, and Chen (2013) argue that this problem may emerge in any other culture that is not American.

Other negative findings show a lack of knowledge about the diagnosis process and that an improved accuracy in the documentation is necessary (Müller-Staub, Lavin, Needham & van Achterberg, 2006). Critics about absent diagnoses and the need for more précised nursing diagnoses has been raised in several studies (Olaogun, Oginni, Oyedeji, Nnahiwe & Olatubi, 2011; Lai, Chao, Yang, Liu and Chen (2013); Thordens & Thorteinsson, 2002; Halverson et al., 2011).

## Previous research

One study that describes nursing needs by using nursing diagnoses is Coenen, Weis, Schank, and Matheus (1999) study where they describe parish nurses work by identifying the most common nursing diagnoses. Fátima Lucena and de Barros (2006) made a study about nursing diagnoses in an intensive care unit in Brazil where they identified the six most common nursing diagnoses. Another study conducted in Nigeria aimed to investigate the utilization of NANDA diagnoses in one hospital. In the result they present the most common diagnoses found in the nursing documentation (Olaogun, Oginni, Oyedeji, Nnahiwe & Olatubi, 2011).

## THESIS PROBLEM STATEMENT

Before the trip to Thailand, a literature search about primary health care in Thailand and literature concerning a similar patient group in a similar context was made. Very little literature regarding these subjects was found. Furthermore studies conducted in Thailand regarding NANDA as a tool to describe a patient group could not be found. Therefore by describing this patient group the authors' wishes to contribute with more knowledge on this subject.

## AIM

The purpose of the study was to identify and describe the nursing needs of a patient group from a low socio-economic background located in an urban primary health-care setting in Thailand by using NANDA.

## RESEARCH QUESTIONS

Which are the main nursing needs in the observed group?

Are there any correlations between the NANDA diagnoses identified in the patient group?

## METHODS

### Design

The study is a structured observation study with a quantitative approach. A structured observation study is a technic where the observer has rules that describe in advance what is meant to be observed and an observation schedule is used (Bryman, 2011). A quantitative approach was used due to the fact that the nursing needs observed was categorized as nursing diagnoses according to NANDA, which was collected in a large population with limited variables (attachment 2). Characteristic for a quantitative method is standardizing, use of structured measurements such as the NANDA taxonomy and the study are based on a large population with limited variables (Olsson & Sörensen, 2012). According to Polit and Beck (2012) the study can be labeled a descriptive correlation study which means that the aim of the study is to define the frequency of occurrence of behaviors and conditions by describing different variables and analyzing the correlation between the diverse variables (ibid.).

### Study Sample

The sample of the population in the study includes all the patients observed by the authors at the health center and all the patients visited at home in the slum areas located close to the health center. The authors conducted the observations during the days when they were able to stay the whole morning at the same place or the entire morning visiting patients at home. Therefore the sample cannot be considered a random sample

it is more a coincidence sample. According to Olsson and Sörensen (2012) a coincidence selection can be explained as a non-random sample of people that is currently available to the researchers. The total number of patients included in the study was 96 of which 20 cases were from home visits. Children under 18 years were excluded in order to make the sample more homogeneous. By choosing a more homogeneous group the risk for confounding may decrease (Polit & Beck, 2012). Also excluded from the result were all individuals who applied for medical health certification and health checkups needed for employment.

The observations at the health center occurred only in the mornings between 8am to 12am when it was open reception mixed with scheduled visits. 90 percent of the people visiting the health center came from the surrounding slum areas. The data collection took place during four days in the health center and four days of home visits. The four days in the health center consisted of two days with appointments for patients suffering from hypertension and two days with patients suffering from DM II and this mixed with everyday unscheduled cases. Important to mention is that the special days for hypertension or DM II were not strictly followed. These are often comorbid conditions, thus it occurred frequently that a patient with DM II would show up for an appointment on the day of hypertensive appointments, and vice versa. The drop in patients had a variety of minor illnesses and symptoms. Patients also came with a referral from hospital for monitoring, suture removal, and redressing of wounds. It is important to mention that the health center did not have a lot of resources for examination. Patients with acute and more advanced disorders were immediately referred to the hospital.

## Data collection

The data consist of the authors' observations of the patients and the information given from the staff at the health center. Notes were taken during and directly after the observations. The nursing needs were in focus but also age, gender, and medical diagnoses were documented. The observations of nursing needs were structured according to VIPS (Ehnfors, Ehrenberg & Thorell-Ekstrand, 1998) as support model at the time of observation. The VIPS model contains a number of keywords similar to the domains and classes in the NANDA taxonomy (ibid.). The VIPS keywords used as

support for gathering data is presented in attachment nr 2. The NANDA diagnoses were made in direct connection to the observations.

## Data analysis

The data collected from each patient were studied at the end of each day of observation. Patients nursing needs were identified and categorized according to NANDA. The observations of the patients that could be described as NANDA diagnoses, the medical diagnosis, demographics, and characteristics (signs and symptoms) were inserted in a Microsoft Excel chart to get a graphical overview. How this chart was designed can be seen in attachment 3. In order to find relationships with statistical significance between the variables such as the different NANDA diagnoses, characteristics, and medical diagnoses the data was analyzed with the statistical computer program JMP statistical discovery™ from (JMP statistical discovery™ from SAS). A value of $(p= \leq 0.5)$ was considered to be significant. Analysis of variance (ANOVA) and Pearson's chi-squared test, with a rejection level of 5 percent was employed in order to find similarities and differences (Polit & Beck, 2012). The authors then selected to present the result that responded to the research questions and the purpose of the study.

## ETHICAL CONSIDERATIONS

The study was conducted in accordance with the four main ethical requirements from the humanities and social sciences, which are: information requirement, confidential requirement, consent requirement, and utilization requirement. According to the information requirement, the researchers informed staff at the health center about the research. An oral approval to conduct the study was given from the Thai Red Cross College of Nursing. Furthermore the consent requirement was achieved from the staff at the health center. It is important to state that the researchers did not interact in any way with the patients. The data was gathered only by information given orally from the health-care staff and from direct evident observations made by the researcher. Concerning the confidential requirement, all data was collected and stored so that all individuals included in the study were given ultimate confidentiality. There is no assembly between the participant's identity and the data. All data is used for research purposes only, this in accordance with the utilization requirement. Finally when completed the study all data is deleted and destroyed (Vetenskapsrådet, 2011).

In order not to generalize or consolidate prejudices about the patient group in this for the authors' foreign culture, but to understand their problems and to be able to individualize the image of these patients, it has been necessary to compile and categorize their needs. Therefore it has been useful to structure the observations and impressions using NANDA. According to Stier (2009), it is important to recognize and respect different cultures. An encounter with a new culture can lead to ethical dilemmas. To avoid a collision of cultures and to increase the credibility of the study, the authors have focused on the importance of respecting the local population, their religion, values, and rules.

## RESULT

### Demographic data

Data was collected from 96 patients, where 73 were women. Twenty cases were collected at home visits in the three different slum communities and 76 cases in the health center. In the sample 72 percent were diagnosed with hypertension, 30 percent with DM II, and 40 percent with hyperlipidemia. In the sample 31 percent suffered from obesity. The demographic data, medical diagnoses, signs, and symptoms are presented in table 1.

**Table 1.** *Patient demographic; medical diagnoses, signs, and symptoms.*

| Parameter | Male | Female | Total |
|---|---|---|---|
| **Patients included in the study** | n 23 (%) | n 73 (%) | n 96 (%) |
| Type 2 Diabetes mellitus | 3 (13*) | 26 (36) | 29 (30) |
| Hypertension | 17 (74) | 52 (71) | 69 (72) |
| Hyperlipidemia | 7 (30) | 31 (42) | 38 (40) |
| Obesity | 4 (17) | 26 (36) | 30 (31) |
| Impaired tooth status | 4 (17) | 13 (18) | 17 (18) |
| Impaired Walking | 2 (9) | 12 (16) | 14 (15) |

*\*) The percentage indicates the proportion of men/women with each diagnosis*

## Identified nursing diagnoses

The total number of different NANDA diagnoses identified in the sample was 42, out of these 29 were nursing need diagnoses and 13 were nursing risk diagnoses (Attachment 2). The number of nursing diagnosis per patient varied between 1 and 14. Most common was to have three nursing diagnoses but also an amount of 4 and 7 diagnoses were frequent. The total number of nursing diagnoses identified was 609. How many patients that were given each diagnosis and all diagnoses found can be seen in Attachment 4.

## Nursing needs diagnoses

Of all identified nursing diagnoses 217 were nursing needs diagnoses. The six most common nursing needs diagnoses are presented in table 2.

*Table 2. The six most common nursing needs diagnoses identified.*

| Nursing needs diagnoses | Male n 23 (%) | Female n 73 (%) | Total n 96 (%) |
|---|---|---|---|
| 00001 Imbalanced nutrition: more than body requirements | 5 (22*) | 29 (40) | 34 (35) |
| 00168 Sedentary lifestyle | 5 (22) | 28 (38) | 33 (34) |
| 00099 Ineffective health maintenance | 5 (22) | 17 (23) | 22 (23) |
| 00048 Impaired dentition | 5 (22) | 11 (15) | 16 (17) |
| 00088 Impaired walking | 4 (17) | 12 (16) | 16 (17) |
| 00085 Impaired physical mobility | 3 (13) | 12 (16) | 15 (16) |

*) The percentage indicates the proportion of men/women with each diagnosis

## Nursing risk diagnoses

The number of nursing risk diagnoses identified among the patients was 392. Three diagnoses regarding risk for ineffective cardiac tissue, peripheral tissue, and renal perfusion was highly repetitive in the result (table 3). Patients with these three diagnoses were not older than the other patients. These patients consisted mostly of patients who were at risk, for example due to a high blood pressure or DM II.

*Table 3. The six most common nursing risk diagnoses identified.*

| Nursing risks diagnoses | Male n 23 (%) | Female n 73 (%) | Total n 96 (%) |
|---|---|---|---|
| 00228 Risk for decreased cardiac tissue perfusion | 23 (100*) | 52 (71) | 75 (78) |
| 00228 Risk for ineffective peripheral tissue perfusion | 18 (78) | 52 (71) | 70 (73) |
| 00203 Risk for ineffective renal perfusion | 9 (39) | 59 (81) | 68 (71) |
| 00155 Risk for fall | 6 (26) | 32 (44) | 38 (40) |
| 00197 Risk for dysfunctional gastrointestinal motility | 5 (22) | 32 (44) | 37 (39) |
| 00004 Risk for infection | 6 (26) | 24 (33) | 30 (31) |

*) The percentage indicates the proportion of men/women with each diagnosis*

## Correlations

Based on the results found by running the data in the statistical computer program some variables gave results in terms of statistically significant correlations. Patients diagnosed with DM II were not older than the rest of the sample. But patients with DM II had more medical diagnoses; 2.7 medical diagnoses compared to 1.6 medical diagnoses that is the mean value among patients in the sample not suffering from DM

II. Patients with DM II had significant more risk diagnoses but they did not have more needs diagnoses (table 4).

**Table 4.** *Patients with type 2 diabetes mellitus compared with non-diabetics patients (\* indicates p=<0.05).*

| | Type 2 diabetes mellitus (n= 31) | No Type 2 diabetes mellitus (n=65) | p- value |
|---|---|---|---|
| Imbalanced nutrition: more than body requirement | 42% | 36 % | 0.124 |
| Sedentary lifestyle | 38 % | 41% | 0.3564 |
| Impaired dentition | 10 % | 20% | 0.2044 |
| Risk for infection | 53 % | 29 % | 0.003* |
| Loss of sensation in feet | 6 % | 0 % | 0.0385* |
| Impaired vision | 38 % | 46 % | 0.6 |
| Number of nursing need diagnoses | 2.2 | 2.3 | 0.8 |
| Number of nursing risk diagnoses | 6.0 | 3.2 | 0.0001* |
| Medical diagnoses | 2.7 | 1.6 | 0.0001* |
| Age (years) | 62 | 62 | 0.7535 |

The average number of nursing risk diagnoses among the DM II group was 6 compared to 3 in the non DM II patients, which was significantly higher in the DM II group (p=0.0001). Patients diagnosed with DM II had a significantly higher risk for infection (p=0.003). The DM II patients had to a greater extent loss of sensation in feet (p=0.0385), but they did not have worse vision or dental status than the non DM II patients. Unexpectedly there was no greater incidence of the diagnoses *Sedentary lifestyle* or *Imbalanced nutrition; more than body requirement* in the DM II group compared with the rest of the sample (table 4).

Patients with the diagnosis *Sedentary lifestyle* which was represented in 34 percent of the population had a higher average age. These patients had a greater number of needs diagnoses, 3.6 compared to 1.5 among patients not diagnosed with *Sedentary lifestyle*.

15

The number of risk diagnoses among patients with the diagnosis *Sedentary lifestyle* was also higher; 5.2 compared to 3.5 (table 5). Patients with the diagnosis *Sedentary lifestyle* had more fractures and they had more often the nursing diagnoses *Impaired physical mobility* and *Imbalanced nutrition; more than body requirement*. Other diagnoses found more frequently in this group were; *Risk for infection, Risk for fall,* and *Risk for constipation* (table 7).

**Tabel 5.** *Patients with the nursing diagnosis Sedentary lifestyle compared with all patients without the nursing diagnosis Sedentary lifestyle (* indicates p=<0.05).*

| | Sedentary lifestyle | No sedentary lifestyle | P-value |
|---|---|---|---|
| Number of nursing need diagnoses | 3.6 | 1.5 | 0.0001* |
| Number of nursing risk diagnoses | 5.2 | 3.5 | 0.0002* |
| Medical diagnoses | 2.17 | 1.9 | 0.1874 |
| Age ( years) | 66 | 60 | 0.0136* |

Patients diagnosed with the nursing diagnosis *Imbalanced nutrition; more than body requirement* did frequently have the diagnosis *Sedentary lifestyle* (table 7). These patients had both more needs diagnoses and risk diagnoses, totally 7,7 diagnoses compared to 5,5 in the group without *Imbalanced nutrition; more than body requirement* (table 6).

**Table 6.** *Patients with the nursing diagnosis Imbalanced nutrition: more than body requirement compared to patients without the diagnosis (* indicates p=<0.05).*

| | Imbalanced nutrition: more than body requirement | Imbalanced nutrition: more than body requirement | P-value |
|---|---|---|---|
| Number of nursing need diagnoses | 2.9 | 1.88 | 0.0128* |
| Number of nursing risk diagnoses | 4.8 | 3.7 | 0.0225* |
| Medical diagnoses | 1.87 | 2.0 | 0.5886 |
| Age (Years) | 62.0 | 61.8 | 0.9277 |

The result shows significantly more nursing diagnoses among the older patients in the sample comparing to the younger patients. Diagnoses commonly found in the elderly population were; *Impaired dentition*, *Sedentary lifestyle*, *Risk for fall,* and *Impaired*

16

*physical mobility*. Patients with the diagnosis *Impaired physical mobility* had most nursing diagnoses, where the average was 10 nursing diagnoses compared to 5 in the group of patients without *Impaired physical mobility*.

One of the three most common nursing needs diagnoses was *Ineffective health maintenance*. In the result there is seen significant correlation between this nursing diagnosis and other nursing diagnoses such as *Sedentary lifestyle, Imbalanced nutrition: more than body weight,* and *Risk for fall* (table 7).

*Table 7. Correlation between nursing diagnoses. A check mark indicates a statistically significant correlation between the two nursing diagnoses. Patients with a diagnosis where more likely to have the check marked diagnoses than patients without the diagnosis (p<0.05).*

| | Sedentary lifestyle | Risk for fall | Ineffective health maintenance | Imbalanced nutrition: more than body requirement | Risk for infection | Impaired physical mobility | Risk for constipation |
|---|---|---|---|---|---|---|---|
| **Sedentary lifestyle** | | ✖ | ✖ | ✖ | ✖ | ✖ | ✖ |
| **Risk for fall** | ✖ | | ✖ | | ✖ | ✖ | |
| **Ineffective health maintenance** | ✖ | ✖ | | ✖ | | | |
| **Imbalanced nutrition: more than body requirement** | ✖ | | ✖ | | | | |
| **Risk for infection** | ✖ | ✖ | | | | | |
| **Impaired physical mobility** | ✖ | ✖ | | | | | |
| **Risk for constipation** | ✖ | | | | | | |

## Unidentified nursing diagnoses

The result shows that no nursing needs diagnoses or nursing risk diagnoses were set related to self-perception, role relationship/sexuality, life principles, and growth/development (attachment 4).

## DISCUSSION

## Discussion of method

The authors believe they have fulfilled the purpose of the study by achieving to measure what was intended to measure. 609 NANDA nursing diagnoses on 96 individuals were identified. The validity of this study is reinforced by the high number of data presented and by the use of an internationally accepted nursing diagnostic system containing allocated sign/symptoms and etiologies. According to Olsson and Sörensen (2012) validity relates to the measuring instruments ability to measure what was intended to be measured.

Correlations were identified in the results between nursing diagnoses and between patients' medical problems as well as demographics. These correlations are repeatedly recurring in a systematic way in many of the observed cases, this strengthens the reliability of the study. According to Olsson and Sörensen (2012) reliability is the degree of the conformity of measurements with the same measuring instrument. By using the logic contained in NANDA, the authors have endeavored to categorize, organize and to find correlations in the results. NANDA is a tool that can perform as a framework that improves the chances of success in identifying correct nursing diagnoses despite the researcher's inexperience.

By having coincidence selection of the sample, the study cannot be applicable for the whole population which means that the result cannot be generalized for the entire patient group corresponding to the area of responsibility of the health center (Olsson & Sörensen, 2012). According to Bryman (2011) a coincidence selection can work as a base for further research and connections between already existing results within the same or other fields. Excluding criteria for the sample may also limit the generalizability of the result (Polit & Beck, 2012)

Diagnoses related to self-perception, role relationship/ sexuality, life principles, and growth/development could not be explored due to the language barriers and time limits during the fieldwork. To identify diagnoses within these domains a deeper and broader data is required which needs to be collected by other methods such as interviews. The biggest obstacle for gathering the data was the communication. None of the authors could speak Thai. English was used for communicating even though neither the researchers nor the staff at the health center had English as their native language. This language barrier and the lack of ability to communicate with staff and patients impaired the data collection and therefore also the reliability and validity of the study. It would have been beneficial to have access to an interpreter during the observations.

Observation of each patient at the health center lasted only a few minutes, which also contributed to a small data collection of each patient. During the home visits more time was spent with the patients and a more detailed data could be collected. The data is not randomly selected, It is only collected from people visiting the clinic as well as during the home visits in days chosen by the researchers therefore is the result not representative for the entire area.

## Discussion of results

### Lifestyle related non-communicable diseases

The most common nursing needs observed in the patient group was mainly related to non-communicable diseases. These findings were partly unexpected though areas with a low socio- economic background situated in a developing country often are associated with poverty related communicable diseases (Pawloski, Ruchiwit & Markham, 2011). Studies show a marked shift in the disease panorama from communicable to non-communicable diseases in urban low socio-economic areas al around the world (Goldstein, Jacoby, del Aguila and Lopez, 2005). Goldstein et al. (2005) found in their study that the growing burden of non-communicable diseases in Peru was not only associated with obesity but also had a strong relation to poverty. Pawloski et al. (2011) relate the rise of chronic lifestyle related diseases in Thailand to the substantial economic growth the past decades. The country is now facing the burden of obesity and obesity related diseases and its health-care system is in process of shifting towards preventing and managing chronic non-communicable diseases, such as

cardiovascular disease, diabetes, cancer, and obesity (ibid.). This change in the health-care system towards preventing and managing chronic non-communicable diseases reflect the result in this study thou most of the patients observed visited the health center because of prevention and for managing non-communicable diseases. According to Aekplakor and Mo-Suwan (2009) 22.4 percent of men and 34.3 percent of women are overweight in Thailand (ibid.). 31 percent of the patients observed in this study suffered from obesity (table 1). The patients with obesity were given the diagnosis *Unbalanced nutrition: more than body requirement.* Nugent (2008) describe the so called nutrition transition, a global trend which means that people are consuming more processed food, more animal based products, more sugars, and less fibre. This dietary change is due to both economic and social factors. The globally ongoing reduction of food prices of specially processed food, edible oils, animal products, and sweeteners has led to a growing consumption of these products in developing countries. Research shows that consumption of these products also is more common among the poor because it is more affordable than high quality diets (ibis). This dietary change is also occurring in Thailand and may be one explanation of the high number of obesity in the patient group in this study (Pawloski et al., 2011). Pawloski et al. (2011) explains that traditional Thai food is changing and today ingredients are often being replaced by diets high in fat, animal meats with less vegetables and fruits in addition there has also been a steady increase of sugar consumption. These nutrition factors with the low socio- economic background in the population studied may be one explanation of the high burden of chronic lifestyle related diseases observed in this primary health-care setting in Bangkok. According to Popkin and Gordon-Larsen (2004), the rise of non-communicable disease among the poor is due to the fact that there is a shift in the obesity prevalence in the developing world connected to the GNP (gross national product) of the country. The burden of obesity in a country is likely to be greater among the poor when the countries GNP per capita reach over $2500.This health inequity with higher obesity among the lower socio- economic group is seen in upper middle- income developing economies such as Mexico, Brazil, Turkey, and South Africa (ibid.). Data shows that Thailand crossed this vital line of GNP in 2008, and since then there has been a steady rise of the body mass index in the Thai population (Trading Economics 2012; School of Public Health, Imperial College London, 2008).

**Sedentary lifestyle**

Many of the diagnoses identified among the patients can be linked to a sedentary lifestyle, lack of physical activity, and obesity, which in many cases may be the cause of DM II and hypertension (Aekplakor & Mo-Suwan,2009). 34 percent of the patients in the study were given the diagnosis *Sedentary lifestyle*. Similar to this study Guedes, Lopes, Moreira, Calvalcante, and Arauji (2010) found in their survey concerning people with hypertension that 60 percent of the patients displayed the nursing diagnosis *Sedentary lifestyle* (ibid.). The authors of this study believe that even more patients could have had the diagnosis *Sedentary lifestyle* but it could not be identified due to lack of time and communications barriers. The authors were told by the health staff that lack of physical activity among this particular patient group is very common. Banks, Lim, Seubsman, Bain, and Sleigh (2011) discuss in their article that in many Asian countries there are various obstacles for increasing physical activity such as environmental factors like heat, inadequate urban infrastructure, pollution, and other hazards. Many of the observed patients came from urban slum areas with inadequate infrastructures, narrow streets without open spaces to conduct physical activity.

**The use of NANDA**

One study conducted in a similar way as this was made in a hospital in Brazil that featured identifying nursing diagnoses during consultations in two different patient groups. One group consisted of patients from a Diabetes education program. The most common diagnoses in that group were; *Ineffective therapeutic regimen management* and *Imbalanced nutrition: more than body requirements* (Franzen et al., 2012). Among the patients diagnosed with type DM II in this study the diagnosis *Imbalanced nutrition: more than body requirements* was also a common diagnosis (45%). Furthermore in another study NANDA diagnoses were identified among patients diagnosed with DM II in a community health center in Brazil. In total 37 different nursing diagnoses were found and the most common of these were *Ineffective management of therapeutic regimen*, *Knowledge deficit,* and *Impaired skin integrity* (Teixeira, Zanetti & Pereira, 2009). In this study 23 % of the patients were given the diagnosis *ineffective health maintenance*. This diagnosis was given to patients that could not manage their medication or diet to preserve a good b-glucose or/and blood pressure. *Ineffective health maintenance* is a diagnosis which is similar to the

diagnosis *Ineffective management of therapeutic regimen* used in the studies described above from Brazil.

**Patient groups not represented in the study**

In addition to the large number of chronic lifestyle related diseases only a small number of patients with minor health problems such as headaches, infections, and asthma visited the health center. According to Dr. A. N. Chutitorn (personal communication, 2 May 2013) professor at the Thai Red Cross College of Nursing, patients with minor health problems are more likely to visit drugstore in order to get medication from pharmacist over the counter. Patients between 18 and 45 were not very common at the health center. Dr. A. N. Chutitorn explain that patients from the middle class, who are working, are covered with the social security scheme in order to cover their health-care expense which means that they rarely visit this kind of health-care centers. Upper class citizens normally visit health-care service from private hospitals. The health center is open for anyone in the area and not only for people living in slum areas however its service can only provide general health service within four dimensions; prevention, protection, treatment, and rehabilitation. There is less emphasis on treatments at the health center and there are no specialists to provide more advanced care. Therefore people that can afford seek other health-care facilities in first place (ibid.).

**Mental health and socially factors**

In the group of patients included in the study there are a low number of patients seeking help for mental problems, alcohol or substance abuse. The department of mental health (2008) describes that the main purpose of the mental health services at the primary care levels are concentrated on mental health promotion and prevention such as screening, counseling, and make follow-ups at home. The outpatient department and hospitals are responsibly for secondary and tertiary care levels such as treatment and rehabilitation (ibid.). In this study only one follow up home visit of a patient with mental problems was observed. Another few cases of depression and anxiety were seen in the health center during the research, although the mental health issues were never the main purpose of the visit (attachment 4). One possible reason that may explain the lack of patients with mental health problems could be culturally related. Burnard, Naiyapatana,

and Lloyd (2006) explains that Thailand is a strong Buddhist and tradition orientated nation which influences the popular view on mental health-care. Mental illness is sometimes seen among the elderly and in rural areas as a characteristic for a spirit possession or bad karma. In Thailand it is the families' responsibility to take care of a family member who gets mentally ill. The family might feel ashamed for the persons behavior and do not dare let other people know about it and will keep the person at home (ibid.).

Diagnoses related to self-perception, role-relationship, sexuality, life principles, and growth/development could not be explored as mentioned due to communication barriers and time limits. In another point of view, all these domains are highly culturally and personally associated. According to Andrews (2003), in Thailand the culture influences the communication and sometimes causes obstacles for the nurses to identify the patients real nursing needs. It can be difficult for a nurse to assess the patients nursing needs due to indirect cultural codes in the communication such as Kreng jai. Kreng jai can be explained as: to be polite and considerate, to show respect, to avoid conflict, and not to bother. This also means that a person who is Kreng Jai is not always able to express their opinions and feelings (ibid.). This can be another explanation of why the nurses did not receive any information from these domains regarding the patients. Another explanation can be due to the fact that it is generally easier to identify nursing diagnoses based on physical findings than on psychosocial findings. This is demonstrated in Yönt, Khorshid, and Eser (2009) study regarding the use of nursing diagnoses, which showed a significant lesser number of nursing diagnoses in domains such as "coping-stress tolerance", "role relationship", and "sexuality".

**Gender**

From a gender perspective, no statistically significant differences between men and women were found in the result. First of all the number of men included in the study was too small to obtain any significant differences in the result. Generally there were much fewer male patients seeking health-care at the health center. One explanation may be that men in that area are to a greater extent employed and may be included in the social security scheme.

**Nursing diagnoses**

The authors have chosen to present the nursing diagnoses in the result as two different groups; nursing needs diagnoses, and nursing risk diagnoses. In the NANDA taxonomy there is also one category of diagnoses that is called Health- Promotion diagnoses, this kind of nursing diagnoses describes the motivation and readiness of an individual or group to improve actual health behaviors. One example of a Health – promotion diagnoses is; *Readiness for enhanced coping* (NANDA, 2012). Health- promotion diagnoses could not be identified in this study due to the lack of patient data. Based on data consisting of the background of the patients, sign and symptoms the nursing diagnoses are set. According to NANDA (2012) nursing risk diagnoses is a clinical judgment of a person's human response to health problems or life processes that have a possibility to be developed in a vulnerable individual or group. The risk diagnoses differ from the nursing needs diagnoses because they do not consist of either defining characteristics or related factors but only of risk factors (ibid.). Most of the risk diagnoses in this study were set based on medical diagnoses as risk factors. For example the diagnosis *Risk for ineffective renal perfusion* which was set because of the risk factor DM II. The nursing diagnosis *Ineffective cardiac tissue perfusion* was set on patients that suffered from a high blood pressure together with DM II and/ or obesity.

**Accuracy**

Accuracy of nursing diagnoses is defined by Lunney (2008) as the nurse's judgment of the match between a diagnostic statement and the patient data. Lunney describe the complexity of nursing diagnoses and that nurses interpretations of clinical data differ extensively and that a significant percentages of nursing diagnoses may be of low accuracy (ibid.). The authors in this study found it sometimes problematic to set diagnoses of a high accuracy. According to Lunney a NANDA diagnosis is based on subjective data and personal assessments which make it difficult to always set the diagnosis with high accuracy. NANDA (2012) recommends validating the diagnoses by reconciling the diagnoses with the patient, his/ her relatives or together with a colleague (ibid.). In this study, the authors have followed this advice by discussing each diagnosis between colleagues and supplementary questions regarding patients were asked in connection with data collection. In this study three risk diagnoses was set frequently; *Risk for ineffective peripheral tissue perfusion* (73%), *Risk for ineffective renal perfusion* (71%), and *Risk for decreased cardiac tissue perfusion* (78%) (table 3).

24

The high number of these three diagnosis raised doubts concerning its accuracy. Risk diagnoses are potential risks in persons with certain risk factors (NANDA 2012). One reason of the frequent use of these three risk diagnoses is that the majority of the patients in this study were already individuals with high risk factors such as DM II, hyperlipidemia, hypertension, and/or obesity. Based on several of these risk factors these risk diagnoses were identified. Lunney (2008) call for a greater consistency among nurses in making nursing diagnoses and strategies to improve accuracy related to the diagnostician, the diagnostic task, and the context. The authors of this study believe better strategies for improving accuracy of nursing diagnosis are needed. Müller-Staub, Lavin, Needham, and van Achterberg (2006) found in their study that lack of knowledge about the diagnosis process is one reason of a low accuracy in the documentation. The authors did not have much experience of using NANDA clinically which may have contributed to a low accuracy of the nursing diagnoses set on the patients.

**Nursing needs not represented in NANDA taxonomy**

While using the NANDA taxonomy the authors considered that several nursing problems found during research do not yet have any counterpart in the NANDA taxonomy. Impaired vision, dizziness as well as impaired hearing was something the authors could not find in the taxonomy. The authors believe these are important sign and symptoms which require nursing diagnosis. Impaired appetite was another sign which is not included in the NANDA taxonomy. The closest term found is the diagnosis nr 00002, *Imbalanced nutrition: less than body requirement*, which does not comprise all aspects of appetite loss. Thordens and Thorsteinsson (2002) identified NANDA diagnoses in an emergency health-care context. Similar to the findings in this study, Thordens and Thorsteinsson also present evidence of nursing needs such as dizziness which are not represented in the NANDA taxonomy (ibid.). Similar to these findings Lai, Chao, Yang, Liu, and Chen (2013) argue regarding the lack of more precise nursing diagnoses in the NANDA taxonomy. They considered that NANDA diagnoses sometimes compel nurses to tailor patients to fit the diagnoses and as well tailoring diagnoses to fit the patients. The diagnoses are often not well suited for individual assessments and often the result of this is that the patient's problems are generalized. The authors were during the data collection aware of this problem of tailoring the patient after a diagnosis or vice versa and they tried to avoid it. Being

overweight was a common risk factor among the patient group in this study, several patients were overweight but not so severe that the diagnosis *Imbalance nutrition: more than body requirement* could be set that required 20 % over normal weight. One diagnosis that could be used for these patients is *Risk for imbalances nutrition: more than requirement*. The authors could not set this diagnosis because of the risk factors which described to define the diagnosis were only based on behavioral factors and not by physical factors such as weight excess or BMI.

## Conclusion

The purpose of this study was to identify nursing diagnoses of patients observed in a primary health-care setting in Bangkok with the help of NANDA. In the result 42 different NANDA diagnoses were identified in the observed group. The nursing needs observed in the patient group were mainly related to non- communicable diseases. The most frequent nursing risk diagnosis identified was: *Risk for decreased cardiac tissue perfusion*. The disease panorama observed in the patient group coherent with findings in international modern research. Significant relationships and patterns between nursing needs were identified. That strengthens the idea of using an instrument such as NANDA. In conducting the study it was notable that some nursing problems did not match with any diagnosis in the NANDA taxonomy.

## Clinical Impact

The study shows the nursing needs among a patient group with low-socio economic backgrounds in an urban primary health care setting in Bangkok. The research is valuable because it focuses on a vulnerable group and the research contributes to the development of existing knowledge. NANDA is a good tool to systematize nursing care in the nursing profession. It can be beneficial for students in similar situations to use a tool like NANDA to categorize their assessments and impressions.

## Proposal on further research

Further research about nursing needs in a similar context is required. The authors believe that more studies that enables better defined NANDA diagnoses, as well as studies that facilitate the use of NANDA is necessary.

## Acknowledgements

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# ATTACHMENTS

*Attachment 1. Epidemiological overview between Cambodia, Sweden, Thailand and Turkey (Data World Bank, 2013; Utrikespolitiska institutet ,2010; School of Public Health, Imperial College London, 2008).*

| Indicators | Cambodia | Thailand | Sweden | Turkey |
|---|---|---|---|---|
| **Life expectancy** (years) | 63 | 74 | 81 | 74 |
| **Children per women** (total fertility) | 2,5 | 1,6 | 1,9 | 2,1 |
| **Child mortality** (0-5 years old dying per 1000 born) | 43 | 12 | 2,8 | 15 |
| **Maternal mortality ratio** (per 100.000 live births) | 266 | 48 | 4,6 | 20 |
| **Births attended by skilled health staff** (% of total) | 66 | 99 | No data | 95 |
| **Prevalence of HIV** ( %, age15-49) | 0,5 | 1,3 | 0,1 | 0,1 |
| **Poverty** (% people below $2 a day) | 53 | 4,6 | No data | 4,7 |
| **Inequality index** (Gini index, measures the inequality among values of a distribution, for example levels of income. Zero expresses perfect equality) | 40 | 43 | 25 | 42,7 |
| **Percentage of the population who has access to clean water** | 61 | 98 | 100 | 99 |
| **Literacy rate, adult total** (% of people ages 15 and above) | 75 | 94 | No data | 91 |
| **Mean age - standardized Body mass index , Men (**BMI over 25 is overweight and a BMI over 30 is obese) | 21,28 | 23,03 | 26,37 | 26,7 |
| **Mean age - standardized Body mass index , Woman (**BMI over 25 is overweight and a BMI over 30 is obese) | 21,56 | 24,36 | 25,18 | 28,26 |
| **Prevalence of type 2 Diabetes mellitus (%) Male age >25 years** | 4,7 | 7,3 | 8,1 | 10,1 |
| **Prevalence of type 2 Diabetes mellitus (%) Woman age >25 years** | 5,2 | 7,1 | 6 | 9,8 |

*Attachment 2. Observation support sheet with VIPS keywords*

| Keywords | Patient -1 | Patient-2 |
|---|---|---|
| **Sex** | | |
| **Age** | | |
| **Communication**<br>-Vision, hearing, speech | | |
| **Breathing/Cirkulation**<br>-Edema, sensation, fever | | |
| **Nutrition**<br>-Dentition, excess weight, malnutrition | | |
| **Elimination**<br>-Incontinence, KAD, diarrhea | | |
| **Skin/Tissue**<br>-Ulcer, eczema, rash | | |
| **Activity**<br>-Mobility, walking, support, ADL | | |
| **Psychosocial/sleep**<br>-Fatigue, depression ,anxiety | | |
| **Pain/Sensory impression**<br>Chronic, Acute, dizziness | | |
| **Knowledge/compliance**<br>- medication, rehabilitation | | |
| **Medical Diagnoses** | | |

| Patient | Type of care | Sex | Age | Diagnosis 1 | Diagnosis 2 | Characteristic 1 | Characteristic 2 | 00001 s.175 Imbalanced nutrition: more than body requirement | Total need diagnoses | 00228 s.242 Risk for decreased cardiac tissue perfusion | Total risk diagnoses | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Clinic | M | 63 | Hypertension | Hyperlipidemia | Impaired dentition | Excess weight | 1 | 1 | 1 | 1 | 2 |
| 2 | Clinic | F | 68 | Diabetes | Cataract | Excess weight | Poor management of medication | 1 | 1 | 1 | 1 | 2 |
| 3 | Clinic | F | 66 | Diabetes | Hypertension | Impaired vision | Back pain | | | 1 | 1 | 1 |
| 4 | Home visit | F | 55 | schizophrenia | | Impaired hygiene | Unclean surroundings | | | | | |
| Total | | | | | | | | 2 | 2 | 3 | 3 | 5 |

*Attachment 4. All NANDA diagnoses identified and the number of patients that were given each diagnosis.*

| Domain | Nursing need diagnoses (n) | Nursing risk diagnoses (n) |
|---|---|---|
| **1.Health promotion** | • Sedentary lifestyle (33)<br>• Ineffective protection (1)<br>• Ineffective health maintenance (22) | • Risk prone health behavior (2) |
| **2.Nutrition** | • Imbalanced nutrition: less than body requirements (3)<br>• Imbalanced nutrition: more than body requirements (34)<br>• Excess fluid volume (2) | • Risk for electrolyte imbalance (3)<br>• Risk for unstable blood glucose Level (23) |
| **3.Elimination & Exchange** | • Impaired urinary elimination (5)<br>• Diarrhea (2) | • Risk for dysfunctional gastrointestinal motility (37)<br>• Risk for constipation (14) |
| **4.Activity and Rest** | • Insomnia (3)<br>• Impaired home maintenance (1)<br>• Impaired walking (16)<br>• Self-neglect (2)<br>• Fatigue (6)<br>• Toileting self-care deficit (3)<br>• Bating self-care deficit (4)<br>• Dressing self-care deficit (3)<br>• Feeding self-care deficit (3)<br>• Impaired bed mobility (2)<br>• Impaired physical mobility (15)<br>• Ineffective peripheral tissue perfusion (6) | • Risk for decreased cardiac tissue perfusion (75)<br>• Risk for ineffective gastrointestinal perfusion (28)<br>• Risk for ineffective renal perfusion (68)<br>• Risk for ineffective peripheral tissue perfusion (70) |
| **5.Perception and Cognition** | • Chronic confusion (1)<br>• Impaired memory (3)<br>• Impaired verbal communication (2) | |
| **6.Self- perception** | | |
| **7.Role Relationship** | | |
| **8.Sexuality** | | |
| **9. Coping /Stress tolerance** | • Anxiety (8) | |
| **10.Life principles** | | |
| **11. Safety and protection** | • Impaired dentition (16)<br>• Hyperthermia (3)<br>• Impaired tissue Integrity (5) | • Risk for impaired skin integrity (3)<br>• Risk for fall (38)<br>• Risk for suicide (1)<br>• Risk for infection (30) |
| **12.Comfort** | • Acute pain (10)<br>• Chronic pain (3) | |
| **13.Growth/Development** | | |