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Life and Care Situation of Turkish Migrant Men and Women Diagnosed with Diabetes mellitus type 2

Master's Thesis

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List of Abbreviations

BMFSFJ	Bundesministerium für Familie, Senioren, Frauen und Jugend
BMI	Body Mass Index
DDZ	Deutsches Diabetes Zentrum
D.m. 2	Diabetes mellitus type 2
DMP	Disease Management Program
GDR	German Democratic Republic
HbA_{1c}	Hemoglobin A1c
HCU	Health Care Utilization
HLC	Health Locus of Control
(I) ADL	(Instrumental) Activities of Daily Living
KiGGS	Kinder- und Jugendgesundheitssurvey
QoL	Quality of Life
SDH	Social Determinants of Health
SES	Socioeconomic Status
WHO	World Health Organization
WHOQOL-BREF	World Health Organization Quality of Life Assessment abbreviated form
χ^2-test	Chi-Square test

Abstract

Purpose

This study aims at exploring the life and care situation among the often vulnerable population of elderly diabetics of Turkish decent in Hamburg. Furthermore, it strives to work out possible differences between female and male patients in this subgroup.

Background

The German population is very diverse. There are many studies on diabetes mellitus type 2 among the indigenous population, but little is known about the coping with diabetes among persons with a migrant background. International and national studies show influences of socio-economic and other factors on well-being and self-assessed Quality of Life (QoL) among diabetics; and also gender differences are reported in these contexts.

Methods

Statistical analysis has been performed to test for in- and between-groups differences among a sample of 203 Turkish diabetics in Hamburg.

Results

Women have a significantly lower self-assessed QoL and report different needs for further diabetes training and higher grades of dependency than men. Female respondents also performed significantly lower considering education and availability of social support. There is no gender difference in diabetes literacy, both groups scored rather low. Women report a significant higher need for further diabetes training than men though.

Analyzing self-assessed QoL against the background whether patients are enrolled or not enrolled in the Disease Management Program (DMP) came to the result that female participants rate their QoL higher when taking part in the DMP, while for male participants, the opposite is the case.

Conclusions

Results on QoL, levels of dependency, socio-demographics, lifestyle factors, and health-related data imply that there are other stressors for female Turkish diabetics than their male counterparts. Women's greater need for training may reflect a different way of coping with and acceptance of diabetes.

1. Introduction

This thesis arose from a project exploring living conditions, medical treatment situation, and health literacy among migrants of Turkish origin suffering from diabetes mellitus type 2. The underlying study had been undertaken by the Department of Medical Sociology and Health Economics, which is part of the Center for Psychosocial Medicine of the University Medical Center Hamburg-Eppendorf, and the results presented here refer to a sample of diabetics with a Turkish migrant background living in Hamburg, Germany.

In the year 2010, there were about 15.7 million persons with a migrant background in Germany. This is about one fifth of the total population, and one of the biggest Non-German ethnic groups is comprised of citizens of Turkish origin (destatis 2011). In order to measure up to the complex and heterogeneous migrant population, the concept of "migrant background" was first brought up in the micro census 2005 by the German Federal Statistical Office. It was recognized that only considering "indigenous Germans" and "foreigners" in statistical surveys is not adequate (Noll et al. 2011), and does not allow for valid conclusions in sciences.

The consistent definition of "migrant background" first used in the micro census 2005 counts the following to the population with migration background:

"All persons who migrated to the Federal Republic of Germany after the year 1949, as well as foreigners born in Germany and every person born in Germany as a child of at least one foreign parent or parents with migrant background." (destatis 2009: 6, translation by author).

The respondents in this study are of Turkish decent. Although this group constitutes the second largest migrant population right after ethnic German emigrants from the former Soviet Union (destatis 2011), there are only little medical findings displaying psychological and somatic impairment, while many studies considering health and well-being have been conducted among the autochthonous population.

Statistically, migrants of Turkish origin have a lower socioeconomic status (SES) than the average population, and especially migrants of the first generation, who came to Germany on the basis of recruitment agreements to provide their workforce to the German industry, are widely unintegrated. Regarding the status of health, the few studies that have been conducted among Turkish immigrants show that they have higher prevalences of certain diseases compared to the main population in Germany. This holds especially true for the occurrence of diabetes mellitus type 2, a chronic metabolic disease, which can influence the patient's life excessively if it is not looked after rigorously.

In the beginning, the majority of migrants who came to Germany based on the agreements were male. Female migrants only constituted a small part at first, and are very often set aside in the literature due to their small number. But it is of great importance to pay attention to these women as well, as they left their country for similar reasons men did, and can be considered pioneers as

well. The proportion of women with a foreign or migrant background has been constantly increasing. By now the share of women among the group of migrants is about 50%, varying according to the different nationalities (destatis 2011). Despite of these facts, a gender perspective to explore the life and health situation of migrants has rather played a limited role in science. This thesis strives to explore the life and care situation of Turkish men and women suffering from diabetes and to detect possible differences in health- and care-related aspects. The intention is not to elevate one group over the other and to pit women's health against men's health; this thesis rather aspires to place the various results next to one another, as they exist parallel. Furthermore, it needs to be mentioned that it is not intended to directly compare the health status of migrants to the health status of Germans, implying that the latter is the measure of all things. Instead, it is looked for differences in health outcomes and health related aspects - which are undoubtedly present - in order to find different, more appropriate starting points for interventions among female and male diabetics of Turkish origin.

This thesis partially draws on an intersectional approach as a theoretical framework. The concept of intersectionality as well as the background of this theory is further explained in Chapter 2. Chapter 3 gives a detailed insight on the historical background of migration to Germany, highlighting the situation of female migrants, as well as the current state of research concerning the socioeconomic position and health of Turkish migrants compared to the autochthonous population.

In this context it is also described how the process of migration might influence the health status of migrants. Furthermore, information on diabetes mellitus is introduced in this chapter, as well as factors which can possibly exert influence on the course of the disease, such as socioeconomic position or social support. In the end, it is described how diabetes as a chronic disease impacts Quality of Life of the patient.

In the fourth chapter of methodology, the ways of recruitment of the participants are stated, as well as the chosen concepts and variables for analysis. The results of these analyses are presented in Chapter 5, displaying a description of sample and various other results which show differences in health behavior, lifestyle factors, diabetes literacy, and self-assessed Quality of Life among diabetics of Turkish origin in Hamburg. These results are summarized and discussed in Chapter 6, while in the last chapter of this thesis, possible approaches for a solution to improve health outcomes of Turkish diabetics are presented on individual-, micro-, meso-, and macro level.

2. Theory of Intersectionality

The present thesis is approaching gender differences in several aspects in health and living situation among migrants of Turkish origin. This necessitates a theoretical background which assists in grasping the underlying structures and dimensions of migrants' lives in Germany, which interact to constitute individual life situations. For this purpose, the theory of intersectionality was chosen. This chapter gives an overview on the origin of the theory, as well as its application in different models by scholars. First, the approach of using the theory of intersectionality to explain multiple synergies of discrimination is introduced. Second, the representation of intersectionality in an ecosystemic framework is given. Furthermore, a brief look on migrants' health status through the perspective of intersectionality is presented.

While the development of an intersectional perspective is rooted in the work of US-American scholars studying women of color, the term intersectionality itself can be mainly traced back to the critical race theorist Kimberle Crenshaw. In her essay "Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics" from 1989, she compares the discrimination of African-American women to traffic at an intersection:

> *"Discrimination, like traffic through an intersection, may flow in one direction, and it may flow in another. If an accident happens in an intersection, it can be caused by cars traveling from any number of directions and, sometimes, from all of them. Similarly, if a Black woman is harmed because she is in the intersection, her injury could result from sex discrimination or race discrimination"* (Crenshaw 1989: 63).

This image was taken up by many scholars as intersectionality refers to fluid processes, which occur in every individual holding two or more social identities such as gender, class, age, race, ethnicity, or migrant status (Caldwell, Guthrie & Jackson 2006). Intersectionality theory can be seen as an advance over earlier models that assumed that advantage and disadvantage simply accumulate to produce double or triple jeopardy, it rather stresses that socially constructed categories vary as a function of each other, and it posits that multiple oppressions are simultaneous, inseparable, and intertwined (Schulz & Mullings 2006; Mens-Verhulst 2006). As social determinants play a major role in shaping health outcomes, and factors like age, culture, gender, and class denote social locations which determine one's access to social and material necessities in life (McGibbon 2006), an intersectional framework with its holistic approach, incorporating socially constructed identities and individual social determinants, could increase the understanding of multifactorial and multilevel complexities of inequities in health. Intersectionality strives to elucidate the significance of interacting consequences instead of adding up social categories, and

furthermore, it encounters the difficulty of focusing exclusively on a single health determinant like gender, for example. In taking into consideration the importance of multiple levels of social identity, a uniform treatment of women, regardless of their nature, could be averted (Hankivsky & Christofferson 2008).

The majority of research on intersectionality is from Anglophone countries, where it is not uncommon to draw on the concept of "race" to explain health disparities, while in Germany, the discourse focuses on immigrants. There has been ongoing discussion among scholars, though, whether this concept of "race" is appropriate. Some critique the concept as unscientific and poorly defined and suggest abandoning it from public health research to replace it with attention to the explicit political and social processes that it represents, such as socioeconomic differences or discrimination (Daniels & Schulz 2006: 90, 93). Daniels and Schulz support the use of racial categories to be continued, as they are clearly seen as underlying causes of health inequities and need to be addressed in order to be able to eliminate exactly those (ibid: 93). It is of primary importance though, that categories are used very cautiously. On the one hand, categories are helpful in detecting and addressing discrimination. On the other hand, there is the underlying endangerment of stereotyping groups of a population.

Regarding the historical background of Germany, the concept of "race" has not been applied since the Hitler regime used racist theories to justify the extinction of whole populations, and it will probably never be applied again. In the context of this work, it is preferred to use the social identities "ethnicity" or "migrant status/background", which is much more appropriate in this research.

2.1 Synergistic Nature of Intersections of Social Determinants of Health

It is well recognized that social determinants of health (SDH) play a major role in shaping the health outcomes of individuals, families, and societies. In their work, McGibbon and McPherson (2006) apply the theory of intersectionality to support the improvement of imbalance in the SDHs of women's health. Drawing on their earlier work, they have developed a model that displays how three intersecting areas of social determinants of health produce a complex synergy of oppression, also relying on the work by Mikkonen and Raphael (2010), who examined conceptualizations of the SDH as predictors of mental and physical health outcomes elaborately.

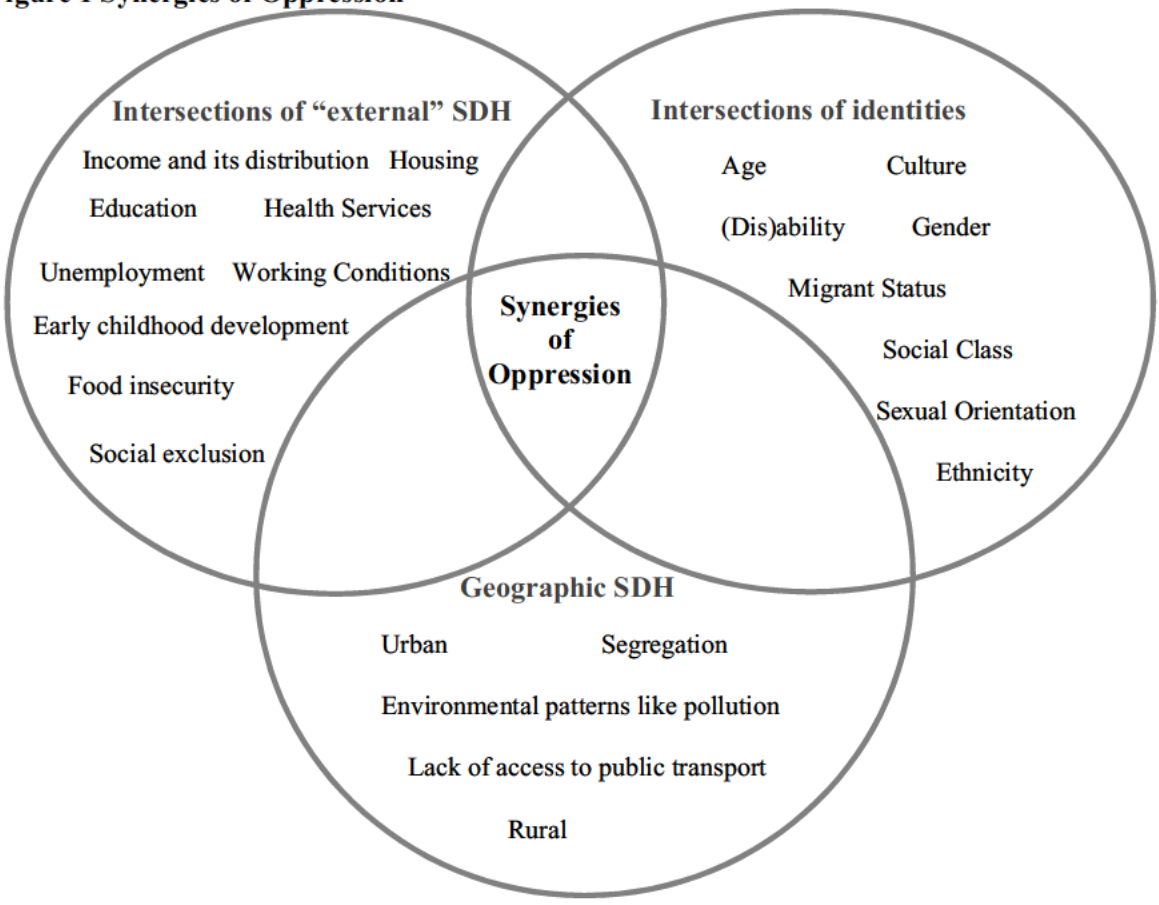
The following figure is an adapted representation of the work of McGibbon and McPherson, it depicts the interlocking conditions very well and emphasizes why the multilevel approach that is intended with the theory of intersectionality is necessary to address the complexities of determinants of health.

The category named "Intersections of 'external' SDHs" is derived from the work by Mikkonen and Raphael, while the others are concepts used by McGibbon.

The figure easily illustrates how different features of intersections can be linked to each other, but also how broader notions of intersections interrelate to form synergies of oppression. To set an example: A lack of education operates in synergy with unemployment or underemployment. This again increases the risk of living in poor housing conditions and food insecurity. Additionally, the economic hardship put on the afflicted individual induces stress. Ultimately, this situation can lead to adverse health outcomes.

The following figure describes how different social determinants and identities intersect to form individual synergies of oppression in the life of a person. In each single section, different aspects can again occur simultaneously and influence each other, such as level of education determines income situation for example, two "external" social determinants of health. In the section of "Intersections of identities", different possible social identities an individual can incorporate are represented. Intersections of social identity may include the membership in a marginalized group (e.g. of lowest socioeconomic status) or memberships in two or more marginalized social groups such as being a female migrant of Turkish origin.

Figure 1 Synergies of Oppression



(Cf. McGibbon & McPherson 2006: 65; Mikkonen & Raphael 2010: 9)

Looking exemplarily at how the intersections of "external" SDH and the intersections of identities interrelate, one can assume that the hardship of un- or underemployment can have particular consequences for an individual with a disability. A low income could withhold this person from activities and necessities associated with additional costs such as a special diet or physical rehabilitation therapies.

Geography can be seen as a foundation, which underlines the different inequities in social determinants of health. A growing relationship between the clustering of minority groups in urban neighborhoods (segregation) and spacial poverty in cities is recognized in the literature, and will also be mentioned in a subsequent chapter of this work. Another example would be people who live in areas with high levels of pollution. They are exposed to an unfair toxic burden, which is not necessarily encountered with a better access to cancer or respiratory health care facilities.

This model demonstrates eminently, how the theory of intersectionality can be used to recognize and address social determinants of health without focusing on one or two single items, but bearing in mind the synergies of different intersections.

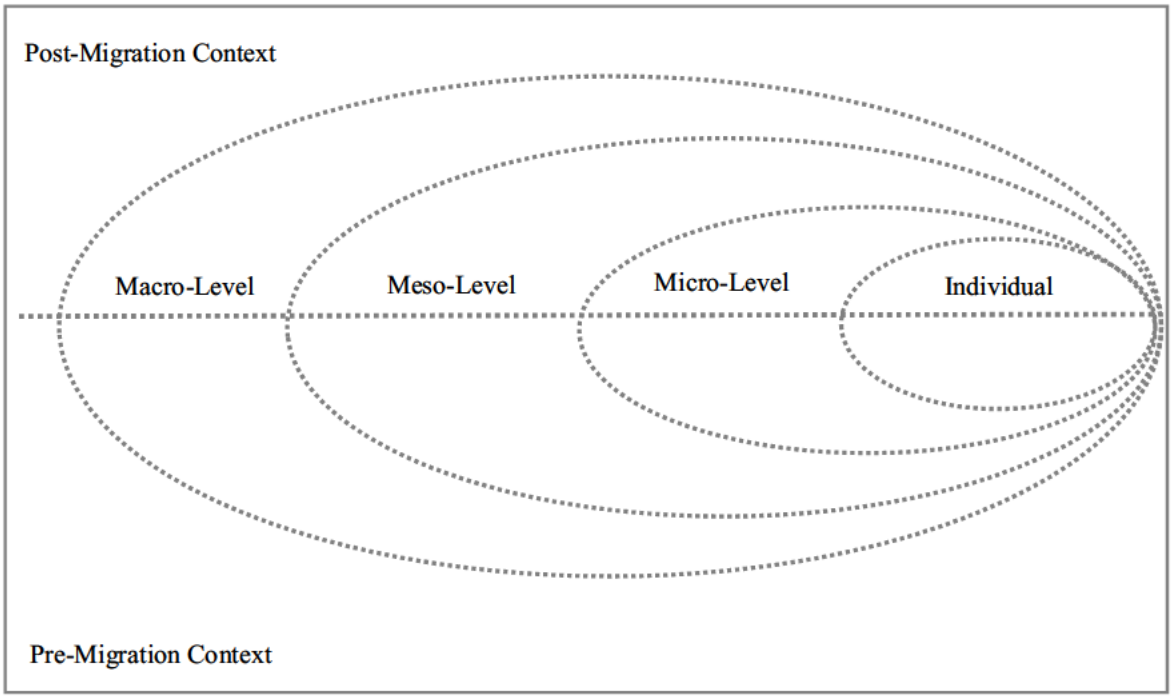
2.2 The Concept of Intersectionality in an Ecosystemic Framework

The following concept was developed by Guruge and Khanlou (2004) for a better understanding of the complexity of the different facets of social identity, and how they intersect to influence the health of individuals. For their research, they draw on the concept of "intersectionalities of influence", which indicates that in the context of health, there are intersections of various origins of influence on physical and mental well-being. This notion acknowledges that influences join in various ways, leading to different health outcomes for individuals (Guruge & Khanlou 2004: 34).

Both scholars come from the field of nursing research and their intention was to introduce a new approach to examine differences arising from intersectionality of various social dimensions, which attributes to an individual a location in social hierarchy. This, in turn, has an impact on health status. The scholars emphasized their research on the health of immigrant and refugee women in Canada.

The ecosystemic framework (see Figure 2) can be used to better understand how individual situations arise from the transaction between the different levels, namely the individual-, micro-, meso- and macro-level, also incorporating the special situation of pre- and post-migration context among females. The transaction between the four levels is seen as reciprocal and continuous (Guruge & Khanlou 2004: 37).

Figure 2 Ecosystemic Framework



(Cf. Guruge & Khanlou 2004: 37)

The "individual" represents how migrant women define themselves, referring to and acknowledging their gender, age, ethnicity, education, social class, and language. As the model allows for incorporating both pre- and post-migration contexts, also early childhood experiences or for example susceptibility for certain infectious diseases are taken into account. On the individual level, these entirely diverse dimensions intersect and create distinct differences within, but also between groups of women.

At the micro-level the authors place the family. Especially among women of migrant background, the family can play an important role in the health and well-being. This depends on whether the family is close-by or still in the country of origin, and the strength of their relationship. However, the family, whether immediate or extended, can be a source of strength as well as a stressor, affecting the health of migrant women in both ways, positively as well as negatively.

The meso-level is constituted of informal and formal networks in the community. Factors within the social network of an individual with an impact on health status are for example school, neighborhood, and the workplace. Again, both positive and negative influences are possible. Exemplarily, living in a very close community such as a neighborhood with a majority of migrants of Turkish background in urban Hamburg, can impose stress on an individual. Everyone knows everyone, and the visit of a medical specialist – especially when she or he also resides in the area and is possibly of the same cultural background – might not go unnoticed. So despite medical confidentiality, very sensitive information becomes known anyways (referring to Burman 2004).

At macro-level, especially factors like health, educational, economic, and social politics are included, which lay the foundation for the social determinants of health. Policies and laws on immigration and resident status for example might result in exacerbated access of certain women to the health care system. And the efforts to offer "cultural matching" (Burman 2004: 296) within health service delivery, through ethnocentric health-care facilities for example, can also limit the choices of women when it comes to dealing with sensitive topics such as partner abuse. Addressing themselves to well-intended constitutions initiated by German policies might be even more damaging to themselves and their families when it comes to practices that are culturally very well accepted and seen as a norm. Discussing this with a male doctor from of the same cultural background might lead to an outcome other than intended by the female patient.

The ecosystemic framework provides a basis for the analysis of the complex intersections of ethnicity, migrant status, gender, and class; and also the interactions of these with other identities as well as with factors on micro-, meso-, and macro-level. It serves as an aid in identifying structural and systemic inequalities and their impact on health.

2.3 Migrants' Health through the Lens of Intersectionality

Various scholars picked up the theory of intersectionality in association with health of minority groups such as persons with a migrant background for example. Zambrana and Dill (2006) studied disparities in the health of Latina women in the United States and argue that research findings in this context always have to be understood in relation to the interplay of domination and subordination of structural arrays, and that the distribution and imbalance of power produces inequities in health (Zambrana & Dill 2006: 193, 194).

The theory of intersectionality does not only allow for factoring in structural and political components, in addition, the intersectional analysis points out the importance of the ways how certain social groups and individuals are represented in and viewed by the society at large, and furthermore, society's expectations connected with these depictions (ibid: 195). This continuous form of stereotyping can have an impact on health. Kerner postulates that intersectionality implies "the existence of gendered racial norms and of racialized gender norms" (Kerner 2012: 211). Stereotypes and gender norms usually differ between Muslim women of Turkish origin, women of "other" ethnic background, and those pertaining to Muslim men of Turkish background. Kerner gives the following example for differing female stereotypes in Germany: White, middle-class, Christian women are often confronted with not having "enough" children. As soon as they do have children though, and strive to resume their occupation, they are portrayed as so-called "raven-mothers", entrusting the child to somebody else's care. In contrary, Muslim working-class women are said to have too many children and not to be interested in anything else but domestic work. As soon as they wear a headscarf, they are also portrayed as a victim of female oppression by a rigid culture that is hostile to women. Muslim men then are automatically pertained the negative image

of being the oppressor (Kerner 2012: 211). This is one example of racist ascriptions against a religious group different from the religion in Germany. But migrants of Turkish background also have to face much other concealed or open discrimination. Typical stereotypes they can also encounter are not to be willing to integrate into German society, not to pursue any further education, only drawing on social benefits, and many more. Typical gendered stereotypes are furthermore that women are seen as the obedient one, wearing a headscarf, not able to speak any German, and (willingly) kept at home to manage all the housework; while Turkish men are very often portrayed as showoffs with a macho component. These stereotypes confront migrants of Turkish origin every day, regardless of their social standing, and surely have implications for many health outcomes. Furthermore, they indicate several disparities which accumulate in migrants' lives in Germany, especially among women of Turkish origin.

Färber et al. (2008) identified several aspects of disadvantages in migrant women's lives. In their study they found inequities in education and working situation, as well as racial discrimination, or perceived discrimination on grounds of religion are described. Among others, these can also be applied to the sample population of this study.

In the sample of the present thesis, the majority of women attained only very low levels of education, and if they had been in an employment situation, it can be assumed that no occupational qualification was required. This is especially the case among migrants of the first generation who came to Germany in the 1960s. The employers were not interested in further qualifying these employees, which has far reaching consequences today. Their low educational level and former working conditions are linked to the precarious financial situation of many migrants of Turkish origin, and it also has an effect on the second and third generation of migrants. While their ancestors are the living example of having been able to earn money despite a lack of education, this does not work out anymore for younger generations in today's highly specialized working world.

Another disadvantage which can be seen among the sample population is language faculty. Although many participants have been living in Germany for decades, their comprehension of German is very low. To impart language abilities to arriving economic migrants did not seem to be of interest in the past, and today, the inability to express oneself can lead to exclusion or even to the experience of open discrimination. Another disparity which can have an effect on the sample population is a disadvantageous housing situation. There are certain neighborhoods in Hamburg with a high population of migrants, and these are usually considered as unattractive and dangerous. In some areas, access to basic and also specialist health care is ensured, whilst other areas lie fallow considering medical assistance.

The majority of the sample considers itself as rather to very religious. In the context of religiosity, Färber et al. found that especially women of Turkish women report to experience discrimination due to their religion (ibid. : 196). This cannot be verified in this study, but is also imaginable.

This implies the necessity of a new perspective considering the determinants of health status of persons with a migrant background.

The given examples show which underlying aspects can have an effect on the health status of diabetic migrants of Turkish origin, and why migrant women possibly perceive their well-being differently from men. Furthermore, it is underlined why conventional approaches of examining migrants' health status might be not appropriate any longer, as they usually incorporate individual, culture-based frameworks. But exactly those cultural explanations can mask the effects of social inequalities on migrant health outcomes, which require a shift to a perspective that also considers the role of structural factors. While cultural justifications for health outcomes among a certain minority group suggest that culture has an impact on social norms and individual health behavior - such as smoking, drinking, or nutrition, for example - they totally ignore the "culture" of societal institutions which are as accountable for producing and reproducing inequalities. It is also not considered which strategies are developed by groups that fall victim to (structural) racism in order to cope with it. Perceived discrimination can have a negative impact on physical and mental health status, and in order to better understand migrants' health outcomes, it is to be examined in which ways migrant status intersects with gender and class (Viruell-Fuentes et al. 2012).

3. Background and Current State of Research

The historical development of economic migration to Germany took place in several phases. The special situation of female economic workers from Turkey is highlighted specifically, because it is rarely mentioned in the literature that female Turkish migrants came to Germany seeking either better economic conditions or simply looking for a change or a way to lead a more liberate way of life. The chapter further analyses the situation of Turkish migrant workers of the first generation compared to the general German population of the same age to depict similarities and / or differences in e.g. health status and socio-economic position between the two groups. Latest studies and theories on influences on subjective health in general, but also on health of type 2-diabetics in specific, are reviewed. Additionally, theories on how the process of migration may influence individuals' health status are introduced.

3.1 Economic Migration to Germany

Talking about elderly migrants of Turkish origin today usually refers to those who immigrated on the basis of the recruitment agreements between Germany and Turkey during the "Wirtschaftswunder" in the early 1960s. Having a look at the process of migration to Germany in general, it can be distinguished in different phases over the course of time (Boeckh 2008). In its first phase, lasting from the end of World War II up to the 1950s, Germany's migration history is mainly characterized by coping with the consequences of World War II. Millions of refugees and displaced persons from Eastern European countries as well as migrants from the then-GDR (German Democratic Republic) came to the western occupation zones. There were barely any foreign workers, as the arising deficit of workforce could be compensated by German migrants. In August 1961, the construction of the Berlin Wall began, and the migration movements from Eastern Europe and the GDR came to an almost complete standstill. Nevertheless, Western Germany was still in a great need of workforce due to the economic recovery which had started in the 1950s. In fact, there was a demand for a body of workers who were unbound considering family ties, showed rather low qualifications, and were willing to work for low wages under considerably bad working conditions compared to the national standard. This led to the second phase of Germany's migration history including several recruitment agreements with different countries. In 1954, one of the first agreements was made with Morocco and Tunisia, followed by e.g. Italy, Spain, Greece, and Yugoslavia. Especially Morocco and Tunisia are important to note in the context of this work, as they are Muslim-majority countries.

So when the recruitment agreement with Turkey, which is of interest in this thesis, was accomplished in 1961, it was not the first and only country whose inhabitants that chose to migrate were Muslim.

This tends to be forgotten often times, as mostly migrants with a Turkish background are confronted with unjustified prejudices considering the acting out of their Muslim religion.

This workers' migration was intended to be only of temporary nature, the initial agreement involved a biennial rotational principle of mostly young males, but also females. The workers received contracts for a specified period of time only, which was designed to keep up a rotation of the workers; a permanent inhabitancy was not primarily intended. This is also expressed in the name that was given to those migrants: *Gastarbeiter*, a German term meaning "guest workers" (Boeckh 2008; Kökgiran 2011).

All in all, this rotational system proved to be impractical, not only for the employers, but especially for the workers. People migrated from Turkey for reasons other than purely economic. International migration offered the possibility to free oneself from traditional social and political boundaries and implicated the embodiment of a new, personal ideal (Schiffauer 1991: 91-102). Thus, many migrants decided to stay for a longer period of time.

Treibel constitutes that the rotational principle in the 1960s did not work out because of the structure of the "guest worker"-employment. The recruited workforce was only employed in industries which had become more and more unattractive for the German population (e.g. mining or textile industry) and employers actually saw a long-term need for those unskilled workers in dirty and/or badly paid jobs. Therefore, foreign migrant workers had become essential for the structural change of the German employment system, as they facilitated the promotion of the native workforce (Treibel 1990: 55-57).

With the occurrence of the first economic crisis (the oil crisis in 1973), Germany stopped the recruitment of foreign labor. This marked the beginning of the third phase in German migration history. While the hiring of new workers stopped due to the recession, family members of present economic workers were still allowed to follow to Germany. As chances to receive a second residence and working permit after the recruitment stop were very low, many of the so called "guest workers" decided to stay in the country and encouraged their families from Turkey to move to Germany as well. Over the following years, the center of many migrants' lives shifted from Turkey to Germany (Kökgiran 2011). New families were founded, and the children of former economic workers went to German schools and later on passed the country's professional training system. The return to their country of origin was no real perspective. By now it should have been clear that the number of persons with a foreign or migrant background in Germany would rather increase than decline, but still political and societal actors simply ignored the fact, that Germany had become an immigration country.

As this had never been intended by the German government and economy, no thought had been spent on possible socio-political or societal implications for the case that those men and women, brought here on the basis of a rotational contract, decided to stay and get their families from Turkey to join them. The change in opinion among politics and the broad public did not happen until the

late 1990s. Among other reasons, discussions on consequences of the demographic change have led to reconsiderations (Boeckh 2008).

In the 1950s and 1960s, exclusively young and healthy persons left their home countries to seek employment in Germany. For one reason this due to selection processes by the employers. The German industry sent out recruiters, accompanied by physicians, to make sure that only individuals free from diseases received employment contracts.

Another reason is that only young and healthy people considered taking on the stressful process of migration, while the elderly rather decided against it. Many young people planned on earning and saving as much money as possible in Germany, and then return to their respective countries of origin to savor their retirement "at home".

The actual quota of returnees to their home country is little-known, but statistics prove a constant increase in the elderly population of migrants. These ageing migrants are a new phenomenon to German politics and society which had not been anticipated.

By now, about nine percent of all persons with migrant background are 65 years of age or older, and those of Turkish origin constitute the largest group in Germany (destatis 2011). Reasons which led to the decision to stay in Germany also after retirement are named in various articles (Schopf et al. 2005; Özcan et al. 2005). Mostly, elderly migrants choose to stay in order to be close to their children and grandchildren, sometimes it is due to a better health care system in Germany or because the political situation in their country of origin has changed to the negative.

This constantly growing group of elderly migrants deserves special attention as they have to face manifold problems and challenges, which will be discussed in subsequent chapters.

3.2 Gendered Perspectives on Migrants from Turkey

Migration research in Germany traditionally focused on male economic migrants, who had left their home countries to seek better working and living conditions. While men were ascribed the role of pioneers, women were rather seen as their attachments, eligible to come to Germany as family members or through marriage. But this focus on men is actually lacking in practical relevance as economic migration to Germany in the 1950s and 1960s also had a strong female connotation (Färber et al. 2008: 13). This general issue in research has also been described by Schöttes and Treibel (1997), who state that men are usually seen as the active ones that are incorporated into research, while women are hardly addressed as their activities are assumed to be passive (ibid. : 85). Economic migration is no male privilege, but satisfies the human basic need for a perspective in life. This is true for women and men alike, and compared to men's, women's reasons to migrate are similarly heterogeneous (Treibel 2007: 105). There might be an economic motive to take on the stressful process of migration, but additionally the rejection of traditional role models and the liberation from a patriarchic society or restricting family ties also constitute a motive of migration for women (BMFSFJ 2004: 11).

Female economic migrants shaped their own biography in a very self-determinant way, and one has to bear in mind that this necessitates quite an amount of courage and confidence in oneself and one's abilities. These women wanted a change and did not fear any hindrances, which implies a strong character. Coming to health, health related risks and resources, as well as compliance to treatment later on, this willpower and self-determination could play an important role.

Depending on the individual situation, women have experienced the same causes for migration as their male counterparts over the course of time: either due to pure existential necessity or resulting from a need for change, due to academic or educational training, being sent abroad as an expert in the name of their employer, or being driven out of the home country by war and/or persecution (e.g. the large Kurdish community in Turkey). These different forms of migration can again be categorized into voluntary or forced, national (from one region to another in the same country) or transnational, and temporary or permanent movements. Economic migration is usually seen as voluntary migration, although this description is problematic as most often precarious circumstances in the country of origin shape the idea of migration in order to be able to lead a better life (Treibel 2007: 107).

Regarding the situation of female Turkish migrants in the 1960s it is clear that they have come to Germany as economic workers, although their numbers were considerably smaller than those of male workers. The proportion of migrant women was only 20% during the whole recruitment period (Schöttes & Treibel 1997: 104), but it increased constantly, especially after the year 1973. By now, the share of women with a migrant background almost equals the share of women in the native population (Färber 2008: 28). Schöttes and Treibel (1997) found that especially women who migrated before the year 1964 showed a high willingness to enter the labor force. These women were rather a minority, but they had purposefully moved to Germany in order to seek employment. Typical workplaces were in the textile or electronic industry, where parts of the native staff have been substituted by "guest workers", usually in fields where working conditions had worsened. Similar to their male counterparts, migrant women were used to fill positions that a German employee would have declined, and while women's tasks in the industry as a whole were rather seen as low-skilled jobs back then, it is to note that the areas of activity of foreign women were even less differentiated than those of German women. Due to the economic recession, which influenced women's occupation in general, but employment among foreign women in particular, the quota of female migrant workers was declining (Schöttes & Treibel 1997: 104-106).

Studies found that when changing to two and three shift systems in the industry, former women's positions were very often filled by male workers (Elkeles & Seifert 1996). The main reason for this is the prohibition of working night shifts for women, a regulation which originates in a German bill from 1878. What was thought as a protection provision for female workers back than unfolded to discriminating working conditions for women in the 20th century, and was not banned until 1992 (Wiederschwinger 1985).

This shows how female migrant workers were (and are) discriminated threefold: being a woman, being an employee, and being foreign or of migrant background led to a disadvantaged position on the German labor market, entailing bad jobs, low wages, inconvenient working hours, and also meaning that phases of employment might be interrupted by unemployment once and again (Schöttes & Treibel 1997: 109). Amongst others, these circumstances laid the foundation for the marginal position many former economic workers hold today. The hard and often dangerous working conditions have led to adverse health effects and early retirement, and due to low wages and unstable employment the received pensions are low, which in turn leads to a higher risk of old-age poverty. It has been noted that the proportion of elderly women of migrant background has adjusted to the proportion in the native population, and that there are similar trends concerning the feminization of ageing (BMFSJF 2004: 7). An increasing number of women are living on their own, whether by choice or widowed, and are especially at risk to live in poverty. This holds true no matter whether they have been employed in Germany or not and makes single elderly women an especially vulnerable group.

3.3 Socioeconomic Position of Former Economic Workers Compared to the German Population

In order to display a holistic approach to the health and care situation of persons with migrant background, their structural position compared to the autochthonous population needs to be taken into account. Boeckh (2008) argues that multiple facts add to a disproportionate risk of poverty and social marginalization among the migrant population. Because of different forms of discrimination, e.g. concerning housing and employment markets, but also due to not fully adapted individual resources of migrants, e.g. language deficiencies and low educational levels, this population group is higher at risk to hold an adverse socioeconomic position. This, in turn, might influence their status of health.

The existence of a social gradient in health is well documented; a full explanation for this phenomenon is still disputed though. On the one hand, individually driven behaviors which are assumed to occur more often in lower social stratum are held responsible, such as smoking, unhealthy diet, and a lack of exercise. On the other hand, there is a wider approach incorporating social implications associated with income inequality, or stressors at the workplace (Chaturvedi 2004).

Ross and Wu (1995) postulated that education is the socioeconomic factor which structures two other factors: income and work; and that education is the key to one's position in the stratification system. Well-educated individuals are more likes to have full-time jobs and less likely to be unemployed and they also show social-psychological resources, including a high sense of personal control.

Educational differences can lead to inequalities in health insofar that a low educational level usually implies low-paid and/or part time jobs or even unemployment. The resulting economic hardship negatively impacts health: there is a constant struggle to pay bills, people tend to feel depressed and hopeless, and this again leads to decreased resilience. The level of education also shapes the sense of personal control, as literacy enables the individual to gather and process information and solve problems. Bearing all these facts in mind, one now has to know that in their assessment from 2005, Özcan and Seifert report that migrants of Turkish background show the lowest educational level compared to Germans and other migrant nationalities. This is also reflected in the low number of individuals with vocational training. Among migrants of Turkish origin in the age group 45-64, 81.8% did not attain professional qualification (Özcan & Seifert 2005: 11). Most occupations, especially for female migrants, used to be located in the industry and services sector; the jobs were unskilled and the people only marginally employed (BMFSFJ 2004: 38). According to this educational structure, it can be assumed that the income situation of migrants - especially of Turkish origin - compared to native Germans is still very disadvantageous, and Turkish migrants receive more transfer payments in all age groups than the autochthonous population and other nationalities (Özcan & Seifert 2005: 19).

Regarding the living situation, it can be said that it is an indicator for the integration of the migrant population on the one hand, and an indicator for a standard of living and social prestige on the other hand. Özcan and Seifert found that migrants usually live in smaller flats and hold the ownership of an apartment less often than native-born Germans. In their study regarding elderly migrants in the city of Bremen, Tempel and Mohammadzadeh (2004) came to similar results. They additionally found that persons with a migrant background pay higher rents, although living in worse conditions than the autochthonous population. Reasons given for this are that migrants more often live in major cities of urban centers, where the residential market tends to be tense, and that the proportion of migrants among those looking for an apartment is usually higher. As new tenancies are often bound to rent increase, this also adds up to higher charges. Putting aside these structural reasons, there is also the possibility of anticipated prejudices being the base for such an economic consideration. Especially in prestigious quarters, tenants might fear that a moving in of socially disadvantaged persons could decrease the attractiveness of the area and thus reduce the value of their property (ibid: 24).

Migrants also live in accommodations of public housing or in typical working class neighborhoods quite often. This form of segregation is due to the mechanisms of social exclusion described above, and likewise due to methods of assignment on behalf of the social administration. In German cities, there is the perilous situation that two forms of segregation accompany each other. On the one hand, there is ethnic segregation, on the other hand the segregation of the underclass. This situation can be very prone to conflicts, as two groups clash, leading different ways of life in an involuntary

neighborhood. Both very often suffer from precarious living conditions and compete for resources, a condition which can impose a lot of stress and pressure on the individual.

3.4 Health Situation of Former Economic Workers Compared to the German Population

The societal and socio-political questions that arose with the permanent establishment of former economic migrants in Germany led to various studies. It is to note that most of these projects were commissional work, e.g. by government institutions, and are often limited to certain regions of the country. Furthermore, studies undertaken in the 1990s usually did not differentiate between migrational backgrounds and nationalities. Data which allows for comparisons between non-migrant elderly and elderly of migrant background is rather scarce. Additionally, one has to bear in mind that the group of migrants in Germany is very heterogeneous. Health risks and resources might be distributed very unevenly, e.g. due to individual traits of a person, different economic success, or the situation in the country of origin (Spallek et al. 2004: 282). But in general, the different studies are able to provide an overview on the structural situation, such as living and working situation of migrants in Germany, and some also incorporate the health statuses of persons with a migrant background in Germany, as well as known health risks and resources (Razum et al. 2008; Reeske et al. 2009; Kohls 2011; Wengler 2011). Considering health statuses, not only objective physical health, but also subjective health and well-being are taken into account (Özcan et al. 2005; Tempel et al. 2004).

3.4.1 Differences in Morbidity and Mortality

When comparing figures of mortality and morbidity between migrant and autochthonous population, quite a few differences can be seen. One explanation is a concept known as the "healthy migrant effect". Due to selective processes which took place in the countries of origin, migrant workers were exclusively healthy and usually quite young (Hirsch n.d.; Schopf et al. 2005; Menning et al. 2009). This generated the statistical result that the migrant population looked not only younger but also healthier than the German main population. This might have been true for the time at arrival in the host country, but by now it has been shown that this healthy migrant effect has worn off completely. While the mortality of migrants in the age group from 20-60 years is still lower than that of the Germans of the same age, the risk of early death among migrants aged 60 years and older is elevated compared to the main population (Kohls 2011: 12).

The overall consensus is that migrants suffer from structural disadvantages when compared to the main population. This, amongst other reasons, has an impact on migrants' health statuses and the related mortality (Sting 2012). It is incorrect to state per se that the migrant population is sicker than the German population. Again, the heterogeneity of the former does not allow for direct

comparison, as social differences among migrants might even be more distinct than among the autochthonous group.

Several studies found a higher risk for certain types of morbidity. While the autochthonous population is suffering more frequently from non-communicable chronic diseases such as coronary heart disease e.g., the migrant population suffers more often from infectious diseases such as tuberculosis (especially true for migrants from the former Soviet Union) or gastroenteritis caused by Helicobacter Pylori, which is most common among migrants from Turkey (Razum et al. 2008: 28, 41).

3.4.2 Work and Health

Considering sick statuses, workplace injuries, and occupational diseases, there are big differences between the population groups. The sick rates of people with migrant background are higher than those of the majority population, especially in the group 40-64 years of age. Furthermore, it is important to note that particularly women of migrant background have higher sick rates than German men in most age groups. Data collected by the Federal Ministry of Labor and Social Affairs showed that the proportion of occupational accidents in 2003 (fatal as well as non-fatal) among employees with Turkish origin is twice as high as among German employees. Possible explanations are problems in communication and understanding, a lack of training in occupational safety as well as risky orders. In contradiction to workplace injuries, recognized occupational diseases are a long-term consequence of burdening labor conditions and usually occur after long years of employment in older age. On average, most employees of migrant background have been employed fewer years than the autochthonous population, which explains why former economic workers in general are not disproportionately affected by occupational diseases. Employees of Turkish origin constitute an exception, though. Among them, the quota of recognized vocational illness is twice as high compared to all other groups of employees. This allows for the conclusion that they are especially exposed to hazardous working conditions, another factor contributing to multimorbidity in later life (Razum et al. 2008: 45-49).

3.4.3 Subjective and Mental Health

The inclusion of subjective health is another crucial factor which might be able to complete and broaden the image of migrants' health statuses merely derived from morbidity and mortality data. Incorporating self-perceived health allows for a more holistic approach, including the individual's physical, mental, and social well-being, as it comprises the culturally shaped perception of symptoms, an assessment of well-being and functionality, as well as vulnerability to diseases. In a trans-European systematic review, Nielsen and Krasnik (2010) found that most migrants and ethnic minority groups appeared to be disadvantaged regarding subjective health status when compared to the autochthonous population. Different studies in Germany, either regarding subjective health of

Turkish migrants or migrants in general, also came to the result that self-perceived health among the group with a migrant background is lower compared to the autochthonous population of the same age (Tempel 2004; Wengler 2011), and when stratified for sex, women of Turkish migrant background scored lower than their male counterparts (Razum et al. 2008).

Studies on mental health among migrants of Turkish background found that first-generation migrants may be more vulnerable to depression (Iren Akbiyik et al. 2008) and are more likely to experience feelings of isolation, rejection, and emptiness compared to the autochthonous population in all age categories, with significant associations for females (Kotwal 2010). Razum et al. (2008) also found an elevated risk for committing suicide among young Turkish women. One could assume that this might be due to an experienced culture clash. Although living in Germany, many families keep up with traditions and role models brought from Turkey by first generation migrants from mostly rural areas. Especially young women from the second or third migrant generation, who were already born and raised in Germany might experience this as very restrictive and stressing, with negative consequences for their mental health.

A review by Bhugra (2004) seeks to distil information on how migration influences mental health and concludes that migration can be a very stress-inducing process, yet not all migrants go through the same experiences. Theoretically, persons of migrant background might be more depressed or experience negative feelings more frequently due to the loss events they might have suffered. Leaving their home due to various reasons and arriving in a culture different from their own can be very stressful, especially, when certain expectations cannot be met. Additionally, they might experience a culture shock, an emotional reaction as a consequence of not being able to understand, control, and predict behavior in the new environment. This might affect mental health negatively.

Not being able to understand the language of the host country could lead to an increased feeling of being discriminated, and cultural distance may add to a sense of isolation.

As described previously, migrants of Turkish background had high hopes when coming to Germany. They wished for good income, better living conditions, and good education for themselves or at least for their children. Many of these migrants also intended a re-migration back to Turkey in later life, a plan that did not work out for the majority. Comparing hopes and wishes from the past with present reality (adverse physical health conditions, low rents, considerably bad housing and so on) could also add to a negative mental health state among migrants as they feel that their original goals of migration could not be reached.

3.4.4 Health Behavior and Health Care Utilization

Researches on health behavior among migrants found that especially migrants from Muslim countries tend to consume less alcohol than the autochthonous population, but that persons with a migration experience in general show a higher smoking prevalence. Compared to native-born Germans, first- and second-generation migrants from Turkey showed considerably higher smoking

prevalences in all age groups (Reeske et al. 2009). Overweight as a risk factor for several chronic diseases is particularly present among migrant women and children from Turkey (Razum et al. 2008). In the context of nutrition and overweight, the importance of meals, especially with friends and family, are often stated in the literature. Turkish cuisine is very rich in fat and carbohydrates, both ingredients not to be well liked when it comes to diabetic nutrition (Zwick 2007). It has also been reported that overweight in children, especially boys, is not recognized as such, but rather seen as a sign of well-being and family wealth (ibid.). In his diploma thesis, Felix Greiner (2009) was able to demonstrate that this is merely a social and cultural ascription. When analyzing data of the KiGGS Study (the German health interview and examination survey for children and adolescents), he found that parents of migrant background are very well able to correctly recognize overweight in their children (Greiner 2009: 72).

When it comes to health behavior, utilization of the health care system is also a crucial factor. Several European studies analyzed health care utilization (HCU) of migrants compared to the autochthonous population, and came to more or less similar results. In the Netherlands, Reijnveld (1998) found that many first generation immigrants reported a higher use of health care than the indigenous population - particularly among the elderly - , and that this is directly linked to their poorer status of health. Reijnveld also referred to influences of socio-economic status on health and the especially adverse position of migrants from Turkey and Morocco. In Germany, Glaesmer et al. (2010) studied the HCU of first- and second-generation migrants compared to native-born Germans. While first-generation immigrants have higher frequencies of visiting a general practitioner and extended hospitalization, they visit medical specialists less often compared to the other two groups. HCU of first-generation migrants seems to concentrate on primary care, while the access to secondary care might be complicated. Considering preventive checkups and early detection, Zeeb et al. (2004) found that significantly more German-born women than females of migrant background utilized these examinations. Especially among elderly migrants, low HCU might partially be affected by socioeconomic factors such as low education and low household incomes. Accessing secondary care requires knowledge about the German health care system and proficient knowledge of the German language, which is often lacking among first-generation migrants. This might prevent this vulnerable group from participating in the German health care system actively.

Spallek and Razum (2007) found similar access barriers to the German healthcare system and also mention country of birth, cultural origin, duration of stay, and sex as possible hindrances among the migrant population.

3.4.5 Prevalence of Chronic Diseases – The Example of Diabetes

Although migrants suffer more form certain infectious diseases when entering the country, studies have found an association between duration of residence and increased risk of chronic illness.

Especially female migrants of older age groups seem to be stronger affected than any other group (Wengler 2011; Kotwal 2010).

The elevated risk for migrants to develop chronic diseases in older age is also expressed in high prevalence rates of diabetes. According to Salman (2009), the occurrence of diabetes among migrants of Turkish origin is increasing the longer they stay in the host country. A review by Zimmet (1982) revealed that migration studies indicate a change towards a "Westernized" lifestyle associated with an increase in the prevalence of diabetes type 2. This is also stated by Carballo (2006) who says that the stress of migration and possible ways of coping with this situation (over-consumption of food, high consumption of alcohol and tobacco) contribute to developing diabetes. A more recent study which dealt with general prevalence of diabetes indicates that the global prevalence of diabetes among adults will rise from 6.4 % in 2010 to 7.7% in the year 2030 (Shaw et al. 2010).

While there are clear numbers of diabetes prevalence among the autochthonous population, little is known about diabetes and its associated psychological and somatic impairments among elderly migrants (Acvi 2004). Data mentioned by Salman vary between 8% and even 15% of diabetes prevalence among Turkish migrants. These are results from studies in the cities of Gießen and Frankfurt/Main. Additionally, it can be assumed that there are many elderly migrants who suffer from diabetes, but do not know it (Icks 2011). The problem of an estimated number of unknown cases among persons of migrant background and also German-born individuals was described by Hauner (2011). This is worrisome as there are well-documented chronic complications of diabetes and increased mortality rate with increasing disease duration.

3.5 Migration and its Influence on Health

The aspect how migration modifies health because of the conditions in which it develops is noted in different studies (Reinprecht 2011; Bajekal et al. 2004; Montes de Oca et al. 2011), and arising social and medical questions in the care of economic migrants and refugees and are not only of concern in Germany (Hjelm et al. 1997; Wändell 1998; Ekbald 1999; Amit 2010; Wang et al. 2010; Daher et al. 2011).

It is not migration itself which harms people, but rather the circumstances which led to migration as well as the conditions in the country of destination. Social and psychological factors accumulate to multiple burdens. Unfavorable childhood-conditions in the respective countries of origin, physically very demanding working conditions, occupying a rather low socioeconomic status (SES), and adverse lifestyle factors have taken their toll.

Preliminary findings refer to a complex association between migration and health. While the population with migrant background belongs to the underclass more often, suffers disproportionately high from precarious employment and income situations and thus is more prone to diseases due to the adverse socioeconomic position, low SES cannot be the sole explanatory

factor of health inequalities between migrants and the autochthonous population. Health risks and resources among migrants in Germany are as heterogeneous as the migrant population itself. This is due to individual characteristics and the situation in the respective country of origin, and this circumstance hinders the direct comparison with the autochthonous population. Health differences can, but do not necessarily have to be the expression of disadvantage.

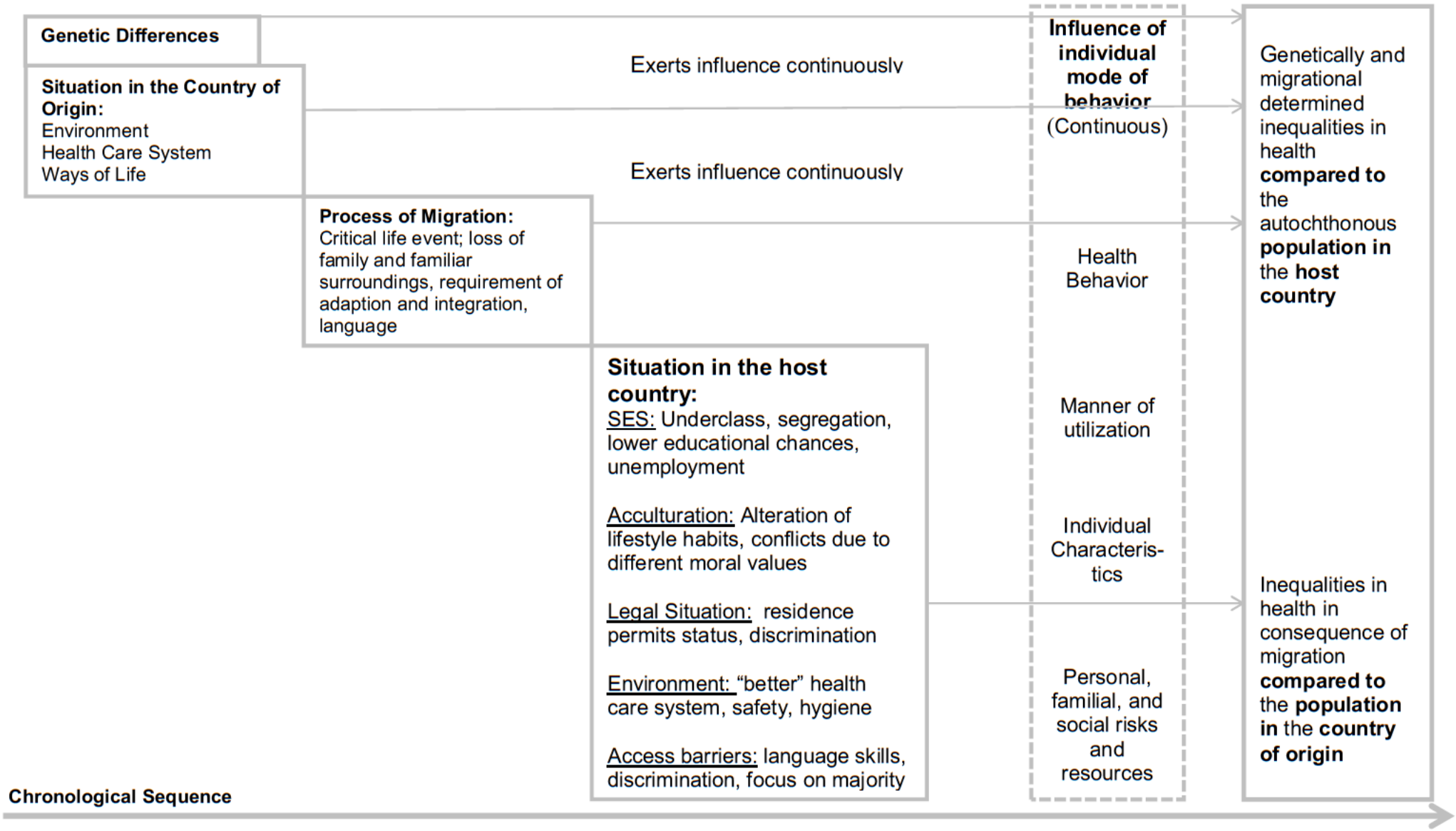
There are different explanatory models of how migration and its psychosocial determinants modify health. Kirckaldy et al. (2006) use a stress model with migration as a critical life event, while Spallek and Razum (2004) describe migration as a "health transition". Many risks for migrants change with the abrupt shift from one stadium of health transition to another, meaning the alteration from a society with high rates of morbidity due to infectious diseases as well as maternal and infant death to a society with lower rates of morbidity, but in turn with higher prevalences of non-communicable and chronic diseases (Spallek & Razum 2004: 278). It is described how nurture (social and physical environmental and living conditions) and nature (genetic factors) influence health risks and resources of migrants, and the following graph is a reproduction of the model by Spallek and Razum who refer to Schenk (2007).

In her work, Schenk introduces a model which is attempting to incorporate all present concepts illuminating the associations between migration and health. In taking into account the different explanatory approaches such as theory of positive selection (healthy migrant effect), migration-stress-hypotheses, theory of the social underprivileged, and access barriers to the health care system as well as biological factors, the holistic model could serve as a structural aid in epidemiologic studies. The original model by Schenk concentrates on two reference groups. On the first level of analysis, it is differentiated between migrants and non-migrants, testing whether differences in health and health behavior between these two groups can be established and which factors are able to explain inequalities in health. On the second level of analysis, Schenk intends to compare populations with a different migrational background with the central objective to detect explanatory factors for differences in risks of illness and health opportunities within the migrant population. Schenk also introduces a third level of analysis but does not take it into account in her model (Schenk 2007). This third dimension of contrast - between the migrant population in Germany and the population in the respective country of origin - is incorporated by Spallek and Razum (2004) in the edited version of Schenk's explanatory model. In their description of how different intrinsic and extrinsic factors influence the health of migrants, all aspects associated with the situation in the host country, such as SES, acculturation, environment, and barriers of access to health care allow for conclusions considering differences in health status between the migrant population and resident population in the corresponding country of origin. Spallek and Razum do not draw comparisons in-between groups of migrants, but it is depicted how genetic differences, the situation in the country of birth, and the process of migration itself might modify the health and care situation of migrants and lead to differences when compared to the autochthonous population.

It is important to note that there are no biological explanatory attempts of elucidating any differences between populations in the German-speaking world. Similarly to the concept of "race", which used to be conceptualized as a biologic and genetic category, these terms are not used in Germany any longer, as the National Socialists' "race theory" legitimized the annihilation of population groups. Nevertheless, genetic polymorphism is referred to as a possible explanation for differences in morbidity and mortality. An example would be the mutation of hemoglobin-S, which is often prevalent in malaria-affected regions. On the one hand, it can lead to sickle cell anemia, but on the other hand it is a protective factor against malaria (Schenk 2007: 91).

Another difference to Schenk's original model is the addition of a time line. Spallek and Razum state that influences are exerted continuously; a stressful event like migration continues to have an effect, even long after the country of destination has been reached. Furthermore, Spallek and Razum incorporate different individual characteristics such as health behavior, employment situation, and social support, which also exert a continuous effect and modify migrants' health. Depending on their occurrence, they might be supportive or detaining factors for the health and care situation of persons with a migrant background.

Figure 3 Model of different influencing variables on health during the course of life of migrants



(Cf. Spallek & Razum 2004; Schenk 2007)

3.6 Diabetes mellitus type 2

The incidence of diabetes mellitus type 2, formerly known as non-insulin-dependent diabetes mellitus or adult-onset diabetes, is increasing worldwide (WHO 2012a). It is assumed that type 2 diabetes results from an interaction of genetic predisposition, behavioral, and environmental factors. Until recently, this type of diabetes was only seen among adults, but by now it is also occurring in children. The following chapter gives an overview on the etiology of diabetes, its therapy, possible secondary diseases due to diabetes as well as on individual risk factors and resources either contributing to an impairment of the disease or leading to a possible improvement in well-being of the diabetic patient.

3.6.1 Diabetes: Etiology, Symptoms, and Therapy

Diabetes is a chronic disease that occurs when the pancreas does not produce enough insulin, or when the body is not able to use the produced insulin effectively. Insulin is a hormone that regulates the blood sugar. It is necessary to store blood glucose that comes from food in the cells. The disease can be differentiated into different types. Diabetes mellitus Type 1 is characterized by a complete lack of insulin production and used to be also known as insulin-dependent or childhood-onset diabetes. Diabetes mellitus type 2 (D.m. 2), which is of interest in this study, is in turn characterized by an inefficient use of insulin. It comprises 90% of people with diabetes worldwide, and is very often the result of excess body weight and the lack of physical activity (WHO 2012a). Hyperglycemia (raised blood sugar levels) is a common effect of uncontrolled diabetes, which can lead to serious damages over time.

The symptoms of diabetes type 1 and type 2 are similar to each other: excessive excretion of urine, thirst, constant hunger, weight loss, vision changes, and fatigue. The symptoms may vary, and especially for D.m. 2 there is the risk that the signs are less marked and the diseases is only diagnosed several years after onset, when complications have already arisen.

Consequences of diabetes are a damage of heart, blood vessels, eyes, nerves, and kidneys over time. This means an increased risk of heart attack and stroke, neuropathy (in a combination with a reduced blood flow it can lead to ulcers), diabetic retinopathy (a cause of blindness), and kidney failure.

The treatment of diabetes involves lowering blood glucose through medication (either oral or injective) and decreasing other known risk factors that are e.g. smoking, overweight, and physical inactivity (WHO 2012b). In 2002, Disease Management Programs (DMP) were introduced in Germany. They have been developed for certain indications such as coronary heart disease, chronic obstructive lung disease, breast cancer, or diabetes mellitus 2. The DMP is not to be seen as a substitution for medical counseling, they are rather of informative nature. The patient is informed about the disease, the symptoms, and possibilities of therapy and medication. Participating in the DMP Diabetes can help patients to manage their disease as autonomously as possible. The patients

are held to keep to regular check-up visits, where their blood-values are monitored. This allows for best possible adjustment of medication. Furthermore, the patients are offered the participation in special trainings regarding their disease, for example nutrition counseling or how to handle insulin injections.

The DMP is aiming at a good self-management of the disease through the patient and maintaining good levels of perceived Quality of Life despite being ill, because diabetes, like no other chronic disease, affects the patients' lives in all its aspects. A consequent monitoring of blood glucose levels to avoid hyper- or hypoglycemia is necessary, but still does not free the patient of their occurrence. Diabetic patients are held to keep to a special nutritional regimen, which might be difficult when going on a holiday, eating out, or simply enjoying certain foods. Physical activity is highly recommended, but blood glucose levels vary depending on the level of activity. An excess of sports may lead to hypoglycemia again. Diabetes and all its related aspects becomes the patients' constant companion, and its therapy requires a high level of will power, self-management, and adherence to treatment, all against the background that diabetes is not curable. Finck and Holl (2011) describe how a chronic metabolic like diabetes affects capability, Quality of Life, and longevity. They state that diabetes has an enormous social dimension and its impact can be noted in several domains. A few examples are metabolic-related deteriorated capability, job discrimination, socioeconomic burden, or disadvantages when contracting insurances.

3.7 Influencing Factors on Health Outcomes among Diabetics

Besides the known positive effects of a healthy diet, regular physical activity, and maintaining normal body weight (or reducing overweight) on the progress of D.m. 2, there are also other aspects which might exert positive or negative influence.

3.7.1 The Influence of Socioeconomic Status

In previous studies, the impact of socioeconomic factors on mortality and complication rates of diabetes was examined. Connolly and Kesson (1996) found that diabetic patients from areas of low socioeconomic status are at increased risk of cardiovascular diseases. The authors substantiated this with their findings of a higher prevalence of obesity, high numbers of smokers, and the presence of three or more general cardiac risk factors in most deprived socioeconomic categories. This has also been corroborated by other articles mentioned in a review by Brown et al. (2003). There it is stated that the association of a higher socioeconomic position and better health outcomes is partly explained by better access to primary and specialty care. Low educational status has also been identified as a risk factor for complications and mortality rate. Nilsson et al. (1998) found the highest percentages of people with diabetes among those with low-attained levels of education, those who lived alone, and those who did not own their own home. Additionally, they found a higher age-adjusted mortality risk for females with diabetes than that of corresponding males with diabetes in the low education group. In another study, Larsson et al. (1999) used levels of HbA_{1c} (a

value that refers to glycated hemoglobin and identifies average plasma glucose concentration) as indicators for metabolic control. A concentration of $HbA_{1c} \geq 10\%$ was defined as "poor metabolic control" and the study showed that diabetic patients with poor control reported more vascular complications, more nervous symptoms, a lower educational level, and less physical activity than patients in good control (HbA_{1c} of 6.5 – 7.5%). Klein et al. (1994) indicated that proliferative diabetic retinopathy (loss of vision) was more likely to develop among women with less education than in well-educated females.

3.7.2 The Influence of Social Support

Other studies provided evidence of beneficial factors considering diabetes and adherence to treatment. Tillotson et al. (1996) found a positive association between social support and adherence to treatment, while other studies observed that cohabiting and experiencing marital satisfaction are related to higher levels of diabetes-related satisfaction. Trief et al. (2001) found that fewer health problems and a greater number of years married predicted increased diabetes satisfaction and less diabetes impact. The data indicated that marital quality does relate to an individual's adaption to diabetes. Akinci et al. (2007) also reported that married patients stated a significantly better health related Quality of Life, higher satisfaction, less worries, and less impact of diabetes. The concept of Quality of Life and how it can be influenced by chronic diseases will be covered again in the next chapter.

Another approach of examining the effect of social cohesion and social support on general health (Mulvaney-Day et al. 2007) found a strong association between family support and self-rated mental health after controlling for variables like language, education, and income; so there are possible healthful effects of qualitative support from social networks, including friends and family. In a report on Turkish diabetic patients in a rehabilitation hospital by Hübner et al. (2008), positive aspects of social support are also described. But it is also stated that close family ties and high solicitousness is experienced as a burden and intrusion, and thus can exert a negative effect.

3.7.3 The Influence of Religiosity and Health Locus of Control

There are also approaches in research to assess the influence of religiosity and Health Locus of Control (HLC) on well-being and health. The construct of HLC is derived from the social learning theory, which states that through a learning process, individuals will develop the belief, that certain outcomes are a result of their actions (internals) or a result of other forces independent form themselves (externals). The Health Locus of Control scale was developed to measure the degree to which individuals believe that their health is or is not determined by their own behavior. This multidimensional instrument consists of three scales that intend to elicit whether a person believes that his or her health is determined by internal factors, powerful others, or chance (Wallston et al. 1981); (more information also in Chapter 4.2.6).

The findings by Tillotson et al. (1996) measuring internal locus of control are rather modest. However, HLC is a significant predictor of adherence to treatment, and the authors assume a partnership of both internal and powerful other Health Locus of Control as well as social support is brought into action when it comes to chronic diseases such as diabetes.

Considering religiosity and its mediating effects on health, there are different views and findings in the literature. They all have in common though, that the construct of religiosity is very complex and hard to grasp. In their article, Ellison and Levin (1998) give an in-depth overview on explanatory mechanisms how aspects of religious involvement could lead to positive health outcomes, among others referring to regulation of individual lifestyles and health behaviors, provision of social resources, and e.g. coping resources. Kirchner and Patino (2010) hypothesized that religion acts as a buffer between stress and symptoms of depression. In their study among Latin American immigrants, they found that the stronger women's feelings of faith and religiosity were, the less stress and depression they reported, and it is also stated that the feeling of spiritual fulfillment wanes as the time since immigration increases.

Hjelm et al. (2003) examined beliefs about health and illness in diabetic females of different origins in Sweden and found that all individuals believed that their diabetes was caused by factors related to the individual. However, among non-Swedes, supernatural causes, especially expressed as the will of Allah or God, were also mentioned.

The majority of studies were conducted among Christian populations though; there are only a few inquiries in Islamic countries. Tagay et al. (2009) aimed to assess the association between religiosity, psychological distress, and aspects of integration among Turkish and Kurdish migrants in Germany. The study found no associations between religiosity and distress, but there was evidence that migrants, who feel more connectedness to their country of origin than to Germany, showed higher levels of religiosity and rated their religion as more important than migrants, who only have feelings of attachment to Germany. Furthermore, Tagay et al. were able to depict an inverse relationship between aspects of religiosity and ability to speak German. The hypothesis of religiosity as protective factor in mental health could not be sustained, but it is possible that a religious individual can induce sense and understanding in her or his life and environment with the help of religion. In most cases, migration represents an enormous experience of deracination, and the devotion to religion could be seen as an enhanced search for orientation and emotional support as well as a connection to home and culture left behind.

3.8 Quality of Life in the Context of Chronic Diseases

There is increasing recognition among clinicians and researchers that the impact of chronic illnesses and their treatments must be assessed in terms of their Quality of Life (QoL). Objective measures of functional health alone have been recognized to be insufficient determinants of an individual's health status.

The World Health Organization Quality of Life (WHOQOL) Group defines "Quality of Life" as "individuals' perception of their position in life in the context of culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns" (WHOQOL Group 1997: 1). QoL includes those aspects of life that make it particularly fulfilling and valuable, and its scope extends beyond traditional symptoms and includes patients' subjective feelings of wellbeing (Akvardar et al. 2006). Thus it should be incorporated in an "ideal" health assessment in addition to a measure of the person's physical health and a measure of physical, social, and psychological functioning (WHOQOL Group 1998b).

Quality of Life became an important outcome measure for health level and the evaluation of treatment, especially in patients with a chronic disease. The assessment of QoL places patients at the center of inquiry, emphasizing their opinion and responding to their concerns. Patients do not feel treated as cases, but are perceived as human beings with a multifaceted life and with the help of QoL assessment, possible problems in any part of the patient's life can be identified. Helping the patient to overcome this problem can already make her or him feel healthier. This can be of particular importance especially among patients with diabetes, as the disease impacts all different aspects of life.

The original assessment instrument, the WHOQOL-100, contains 25 facets (each including 4 general items) and is covering aspects like pain and discomfort, positive feelings, sleep and rest, working capacity, and personal relationships. All facet scores range from 4 to 20, with higher scores denoting higher Quality of Life, except for the reversed scored facets pain and discomfort, negative feelings, and dependence on medication (WHOQOL Group 1998b).

According to the target group, Quality of Life assessment can be divided into "generic" and "disease-specific" (Dündar et al. 2002), and various studies examined the relationships between diabetes and either generic or disease-specific Quality of Life. In their study on predictors of Quality of Life among adults with D.m.2, Misra and Lager (2008) found that patients with a higher acceptance of their disease perceive lower difficulties with self-care behaviors and report higher Quality of Life. Pala et al. (2004) came to the conclusion that insulin therapy and duration of diabetes shorter than ten years lead to a decrease in QoL. Furthermore, they found that socio-demographic variables also affect Quality of Life: being female decreased almost all scale scores, and also low levels of education had a negative effect on QoL on some of the scales. This negative impact of certain socio-demographic variables is supported by Fal et al. (2010).

3.8.1 Gendered Perspectives on QoL and Chronic Diseases

In the context of this work, ethnic and gender differences in perceived Quality of Life among diabetics are of peculiar interest. Miksch et al. (2008) came to the result that female diabetic patients scored lower on all scales of the QoL assessment than their male counterparts, and there were also significant differences in QoL when considering the enrollment in a Disease Management Program (DMP) for diabetes. Undén et al. (2008) found similar results regarding

differences in self-rated health and QoL between men and women. Additionally, they came to the result that the gender differences are even greater among diabetic patients than among non-diabetics. Misra and Lager (2009) examined significant ethnic differences in Quality of Life in their study which incorporated Hispanic, African-American, Asian-Indian, and non-Hispanic white diabetics. Hispanic participants reported the most worries and felt strongly restricted by their diet, while Asian- Indian respondents reported least worries and non-Hispanic whites felt least restricted by their diet. This information is important to consider for addressing culturally appropriate treatment and intervention programs. There were also differences by gender reported in this study. Again, women scored lower on Quality of Life indicators, and they were also more likely to report difficulties with dietary adherence when compared to male respondents.

A study conducted by Undén and Elofsson (2006) examined different explanatory factors for significant differences in self-rated health among men and women. In men, educational level, physical activity, and cultural activity were strongly correlated with self-rated health, while in women, sleep and doctor visits were correlated more strongly to self-reported health.

These results allow for the conclusion that women and men experience diabetes differently, important information which needs to be considered when it comes to treatment and self-management behavior. This was also described by Kofahl et al. (2012), who examined differences in Quality of Life among female and male diabetics in Hamburg and Istanbul.

4. Methodology

In the following section, the general recruitment of all 294 participants, the assessment of data, and the statistical methods of data analysis are described. In order to be able to perform a longitudinal analysis, only those patients who participated in both interviews (at baseline and after twelve months) were incorporated into this research, resulting in 203 Type 2 diabetics of Turkish origin in Hamburg included in the present study.

4.1 Recruitment and Assessment

The present study was conducted within the framework of a project financed by the German Federal Ministry of Education and Research (Project Number: 01GX0749). The original study conducted from February 2008 to September 2011 at the Department of Medical Sociology and Health Economics had examined the health literacy of Turkish Diabetics. It explored living conditions, medical treatment situation, and health literacy of diabetics of Turkish origin living in Hamburg, the final report was published in 2011 by Kofahl et al.
A positive ethical vote had been obtained from the Chamber of Physicians of the federal state of Hamburg (PV3061).

In the period from July 2008 to July 2009, 294 randomly chosen migrants of Turkish origin suffering from diabetes type 2 had been personally interviewed by fellow countrymen. The team of interviewers was set up of 17 women and 1 man, all of them spoke German and Turkish fluently, some were also proficient in Kurdish language. Most of the interviewers either had a vocational education as a health professional or studied a health-related discipline at that point of time.
Prior to recruitment and assessment of data, the interviewers had been trained intensively by the research team. Supervision of the interviewers took place bilaterally respectively in three group meetings to exchange experiences.
The recruitment of participants in Hamburg was based on two strategies:

a) In cooperation with 15 doctors' practices in Hamburg, 130 patients were recruited from the ambulatory sector by family physicians and diabetologists. Most practices resided in one of the districts of Hamburg with a high population of migrants (e.g. Wilhelmsburg or Altona). To avoid over sampling by certain practices, the number of patients recruited by one doctors' practice had been restricted to 20. The cooperating physicians informed and educated the patients about the study, obtained informed consent as well as the data privacy statements. The data was forwarded to the research institution by the doctors, and the researchers then conveyed the patients' contact information to the 18 interviewers. The interviewers contacted the patients to set up a date either at the patient's home, at a cultural

center, at the practice of the physician in charge or in a Turkish Café. The participation rate was assessed by the doctors' staff, the refusals ranged between 10% and 30%.

b) In a second mode of recruitment, 164 patients had been recruited via the interviewers' social networks, by word-of-mouth, and via public relations at mosques and cultural centers.

The combination of these two modes of recruitment enabled a mostly randomized ascertainment of data. The data of the original study can be regarded as representative for the population of diabetics of Turkish origin in Hamburg.

Duration of the interview was approximately 70 minutes. Although this length was rated as absolute maximum by the interviewers, only two participants discontinued the interview due to its duration.

Although the overall willingness to participate was adequate, the interviewers still encountered difficulties. Obtaining informed consent in order to be able to further use the data was one of the problems. Many participants were reluctant to sign the forms and needed to be informed about the German data privacy act by the interviewers. Reason for the hesitation was mostly bad experiences in the past, for example fraudulent doorstep transactions.

4.2 Materials and Variables Used

Table 1 gives an overview of the dimensions and variables of the questionnaire used for further analysis of gender differences and of Quality of Life among diabetics of Turkish origin in Hamburg. Next to socio-demographic data, variables considering the treatment of diabetes (DMP-enrollment, diabetes training, examination of feet, referrals to ophthalmologist) and other health-related aspects as body-mass-index (BMI), smoking behavior, nutrition, alcohol consumption, co- and multimorbidity (retinopathy, neuropathy, diabetic foot), dependency in the (Instrumental) Activities of Daily Living [(I) ADL] (Vallderama Gama et al. 2000) were assessed. The questionnaire also incorporated questions for social support (Questionnaire EUROFAMCARE: Lamura et al. 2008; Di Rosa 2011), spirituality (Bertelsmann Religion Monitor), and Quality of Life (WHOQOL BREF 26 Turkish Version: Eser et al. 1999).

Table 1 Overview on dimensions and variables of the questionnaire

Socio-demographic Variables	Age, sex, marital status, level of education, employment status, number of children and grandchildren, size of household, ability to make co-payments for medication
Quality of Life	WHOQOL-BREF, Turkish version
Health Locus of Control	4 items of the Health Locus of Control Scale
Diabetes-Knowledge	Score achieved on a few selected questions from the Diabetes-Knowledge-Test of the German Diabetes Center Düsseldorf (DDZ), Self-assessment of diabetes knowledge
State of Health	Co-morbidity and secondary diseases of diabetes, insulin-dependency, Body Mass Index, dependency in (Instrumental) Activities of Daily Living [(I) ADL]
Utilization of Health Care Services	Consultation rates, medication, participation in diabetes training, enrollment in Disease Management Program
Lifestyle factors and nutrition	Smoking status, consumption of alcohol, frequency of physical activity, nutritional behavior
Social support	Need of support and perceived support by family and friends

4.2.1 Dependency in (Instrumental) Activities of Daily Living

The degree of dependency of the participants was measured in terms of their need of support in several domains of the ADL (Activities of Daily Living) and IADL (Instrumental Activities of Daily Living).

The domains used in the surveys were “House-keeping” (e.g. cleaning and cooking etc.), “Personal care” (bathing, getting dressed etc.), “Outdoor activities” (seeing the doctor, running errands etc.), “Mobility” (walking, climbing stairs etc.), “Health care” (taking medicine etc.), and “Finances” (financial support). In the present dataset, these variables were available in a dichotomous manifestation, “0” indicating “No help needed” in the respective (I) ADL, while “1” expresses a need of help. From the six variables named above, a score was computed which depicts the total need for assistance of the individual.

This (I) ADL total-score ranges between 0 and 6, a higher number reflecting a greater degree of dependency. The internal consistency of the (I) ADL-scale is good regarding that it only has six items. Cronbach’s α is .79 for female participants respectively .83 for male participants at baseline. At t_1, Cronbach’s α is .85 for female respectively .82 for male participants.

4.2.2 Social Support

The respondents were asked for their need of support in general [please see previous subchapter for support in the (Instrumental) Activities of Daily Living], their perceived support by family and friends, and also the availability of help if needed. Questions on social support in the questionnaire were based on the EUROFAMCARE questionnaire (Lamura et al. 2008; Di Rosa 2011). The

values of the variable “Support by family” range from “1: not at all or seldom”, “2: mostly yes”, and “3: could not be better”. The variable “Help available if needed” is also trichotomous, the values ranging from “1: No, I could not find anybody”, “2: Yes, but not easily” to “3: Yes, very easily”.

4.2.3 Religiosity

For the study, questions considering spirituality based on the Bertelsmann Religion Monitor have been used. This instrument of the Bertelsmann Foundation looks at the issues of religion and faith and was developed by religious scientists, sociologists, psychologists, and theologists (religionsmonitor.com 2011). Respondents were asked about their membership of a faith community and the intensity of their religiosity. To rate the intensity, answer possibilities ranging from 1 “non-religious” to 5 “highly religious” were given.

4.2.4 Health Locus of Control

The Health Locus of Control (HLC) Scale (Wallston et.al. 1981) has been developed as a unidimensional measure of people’s beliefs whether their health is or is not determined by their own behavior.

Health Locus of Control (HLC) is the degree to which individuals believe that their health is controlled by internal or external factors. Whether a person is internal or external is based on a series of statements. The statements are scored and summed to determine whether the individual has internal or external health beliefs.

There are three 8-items Likert scales which were developed by Levenson to measure generalized HLC:

1. Internal HLC (IHLC) is the extent to which one believes that internal factors are responsible for health/illness.
2. Powerful Others HLC (PHLC) is the belief that one's health is determined by powerful others.
3. Chance HLC (CHLC) measures the extent to which one believes that health illness is a matter of fate, luck, or chance (Wallston et.al. 1981).

In the questionnaire, four selected items of the HLC have been chosen to depict the respondents’ beliefs. The answer possibilities ranged on a five-point Likert scale expressing the participants agreement with the respective item (1 “strongly agree” – 5 “strongly disagree”).

4.2.5 WHOQOL-BREF

The WHOQOL-BREF was derived from data collected using the WHOQOL-100. The latter had been developed over several years with the aim to generate a QoL assessment that would be applicable cross-culturally. Thus, the development had taken place in several different cultures and languages simultaneously (WHOQOL Group 1998a).

While the long form contains 100 items, the abbreviated WHOQOL-BREF is a 26 items generic QoL instrument with five point Likert type response scales (Yalcin et al. 2008). Items inquire "how much", "how completely", "how often", "how good", or "how satisfied" the respondents felt in the last two weeks. The higher the participants rate, the better their self-assessed QoL (with the exception of the reverse-scaled items). The WHOQOL-BREF contains one item from each of the 24 facets of QoL included in the WHOQOL-100; in addition there are two items from the general facet on overall QoL and general health (Skevington et al. 2004).

The 24 facets can be most appropriately grouped in four domains:

1. Physical Health (containing 7 items)
2. Psychological Health (containing 6 items)
3. Social relationships (containing 3 items)
4. Environment (containing 8 items)

The short WHOQOL-BREF version is of good use in situations when time is restricted, where respondent burden must be minimized, or where facet-level detail is unnecessary. The instrument assesses satisfaction with life as well as the impact of disease or illness, and it captures positive and negative aspects of QoL. It has been adapted in more than 40 cultures in the world has also been validated for Turkish by Eser (Eser et al. 1999; Skevington et al. 2004), and the importance of its items for cross-cultural research has also been analyzed (Saxena et al. 2001).

In the present study, data gathered on social relationships at t_1 can be only looked at with reservations. Already at baseline, the respondents were rather hesitant to answer the question about their sexuality (15% missing), and the interviewers also reported feeling uncomfortable when asking. The team of researchers provided several training units for the interviewers, addressing the importance of the sexual dimension and that it is not solely referring to the respondents' sex life. Nevertheless, the interviewers decided against prompting this question to the participants at t_1 to avoid discomfort.

4.3 Statistical Analysis

Data has been analyzed using PASW® Statistics 18 (SPSS). Descriptive statistics on socio-economic variables as well as on disease-related and lifestyle factor data include arithmetic means, standard deviations, medians, as well as the range of variability. For qualitative variables, the frequencies (percentage) were determined.

The distribution type for variables was determined using the Kolmogorov-Smirnov test.

Statistical comparisons between groups were made using an independent-samples t-test for normally distributed data, Mann Whitney U test for non-normally distributed data, and χ^2- test (respectively Fisher's Exact test where appropriate). For within-group comparisons, Wilcoxon test was used. Values of $p < .05$ were regarded as significant.

Spearman rank correlation test was used to examine first-order relationships among the study variables.

Further, the influence of independent variables on the WHO QoL total score, respectively on the score of the WHO QoL subscales was analyzed by linear regression analyses. Predictors of Quality of Life considered in this study are the following: age, sex, level of education, social support (expressed in availability of help and perceived support by family), and dependency in the (Instrumental) Activities of Daily Living. To assess the influence of the individual's financial situation on perceived Quality of Life, the variable "Ability to make co-payments for medication" needed to be used as a replacement for the household net income. The lack of a sufficient number of answers (maybe due to insufficient knowledge or shame to talk about money) in this category inhibited the use of this variable and the possibility to compute the equivalent income.

The null hypothesis for this analysis is that there is no influence of the independent variables on Quality of Life.

5. Results

In the following, the results of the statistical analysis are depicted. First, the method of recruitment is amplified to control for possible sampling errors in the recruitment strategy. Second, the sample is descripted, regarding for different socioeconomic variables. In some cases, significant results in the context of sociodemographics are highlighted specifically. During the further course of the chapter, disease related data such as doctors' visits, enrollment in the DMP, health behavior, and health (diabetes) literacy are depicted. Subsequent, results considering perceived Quality of Life and possible influencing factors are shown, as described in the previous chapter.

5.1 Recruitment Strategy

The following Table 2 displays selected structural features of the group of respondents stratified by method of recruitment (either via doctors' offices or via interviewers). There are no significant differences between those participants recruited via interviewers and those acquired at doctors' offices.

Table 2 Between-groups differences of structural features

	Via Doctor	Via Interviewer	p
N (%)	94 (46.4)	109 (53.7)	
Age in years (Mean)	58.7	58.3	.694[(1)]
Sex (%)			
Female	50.0	56.9	.201[(2)]
Male	50.0	43.1	
Marital Status (%)			
Married or partnership	83.0	78.0	
Divorced, separated, single	5.3	12.8	.172[(2)]
Widowed	11.7	9.2	
Level of Education (%)			
No school education	23.4	24.8	
Primary school 4-5 years	56.4	45.0	.188[(2)]
At least 8 years of education	20.2	30.3	
Time since diagnosis in years (Mean)	9.6 years	9.3 years	.868[(3)]

[(1)] Student's t-test, [(2)] χ^2-test, [(3)] Mann-Whitney

5.2 Description of Sample

Table 3 displays an overview of sample characteristics split by sex. The group of diabetics with Turkish origin consists of 203 participants, 53.7% of them are female. The mean length of stay in Germany is approximately 32 years, and most of the respondents are married or cohabiting. Among the group of females there are significantly more participants that are single, separated, or widowed than among the group of men. In both groups, the dominant language spoken at home is Turkish. Significantly more women than men speak Turkish, while many men use another language (e.g. Kurdish) at home. Men are significantly more often in an employment contract than women, and there are also great gender-specific differences in levels of education.

Table 3 Socio-demographic variables: between-groups comparison of women and men

	Female	Male	Total	p
N (%)	109 (53.7)	94 (46.3)	203	
Age (Mean)	58.26 yrs.	58.74 yrs.	58.48 yrs.	.580 (1)
Length of stay in Germany	32.27 yrs.	32.38 yrs.	32.32 yrs.	.740 (1)
Family status				
Married or partnership	69.7%	92.6%	80.3%	
Divorced, separated, single	13.8%	4.3%	9.4%	**<.001**(2)
Widowed	16.5%	3.2%	10.3%	
Children	94.5%	97.8%	96.0%	.223(2)
Number of Children	3.77	3.45	3.62	**.039**(1)
Grand-Children	77.1%	78.0%	77.5%	.872(2)
Number of Grandchildren	6.89	5.85	6.42	.056 (1)
Number of persons living in the same household	2.85	3.09	2.96	.265(1)
Language spoken at home (Multiple answers possible)				
German	25.7%	25.6%	25.6%	.983(2)
Turkish	99.1%	93.3%%	96.5%	**.028**(2)
Other language	2.8%	7.9%	5.0%	.212(2)
Level of education				
No school education	34.9%	11.7%	24.1%	
Primary school 4-5 years	46.8%	54.3%	50.2%	**<.001**(2)
School education for at least 8 years	18.3%	34.0%	25.6%	
Currently employed	15.6%%	31.9%	23.2%	**.006**(2)
Pensioner	33.3%	43.6%	38.1%	.133(2)

(1)Mann Whitney, (2) χ^2 test

To further analyze the highly significant differences in terms of education, a between-groups comparison of levels of graduation, literacy skills, as well as ability of German language has been performed. The scale "Highest Level of Education" is comprised of seven items ranging from "0" – "No graduation" up to "7" - "University degree". The scale "Total score of education" is comprised of the scores achieved in reading and writing ability, language skills, and a modified, trichotomous version of level of education. The scores on this scale range from 0 to 8.

The results in Table 4 show that women have significantly lower levels of education compared to men considering graduation from school as well as reading and writing abilities. While approximately 12 % of the men did not attain any form of school, this is true for about 35 % of the women. 14 % of the men went to trade school or university; this applies only for about 5 % of the women. Considering the variable "Speech Comprehension German", women and men did not significantly differ from each other. The majority (~ 59%) was either not able to understand the German sentence that was read to them by the interviewer at all, or understood some words but not the overall meaning. Only about 28% of all participants were able to give a fluent and correct repetition in Turkish.

Table 4 Results of between-groups comparison: Education t_0

		Female			**Male**			**Mann-Whitney-U**	
	Scale	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*p*	*N*
Highest Level of Education	0-7	1.07	1.36	109	1.93	1.80	94	**< 0.001**	203
Ability to Read	1-4	2.70	1.22	107	3.36	0.99	92	**< 0.001**	199
Ability to Write		2.67	1.28	105	3.35	1.28	88	**< 0.001**	193
Language Skills		2.33	1.27	107	2.30	1.23	91	.833	198
Total Score Education	0-8	3.92	2.70	105	5.17	2.16	87	**.001**	192

The subsequent figures (4-6) clearly depict the differences in chosen variables in the context of education.

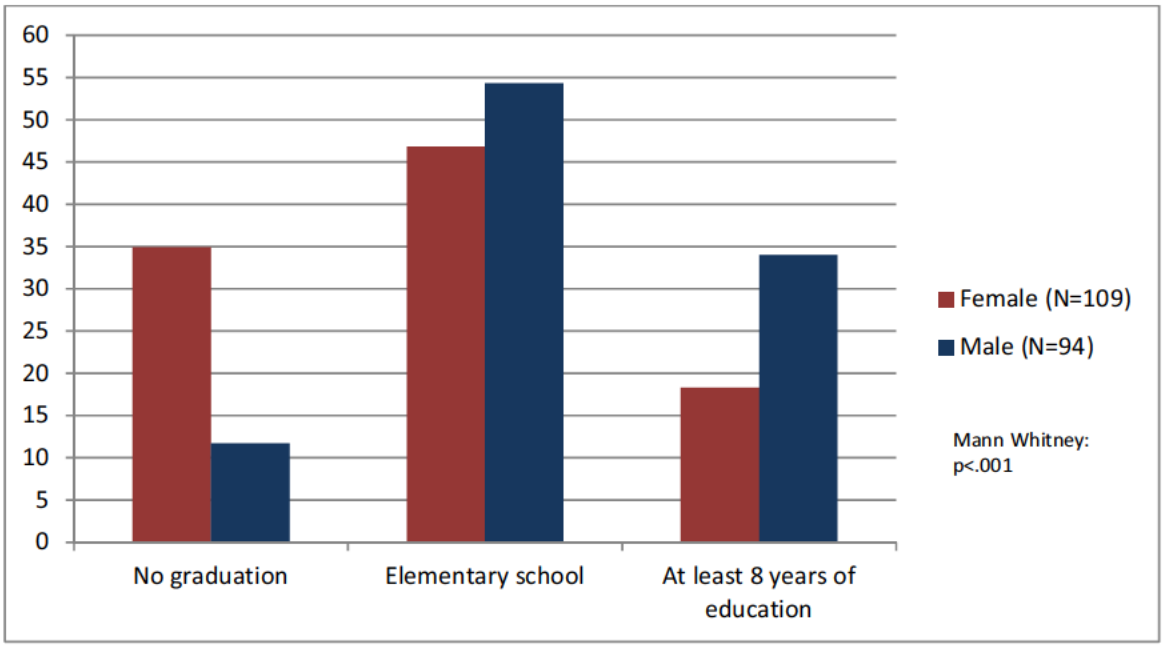


Figure 4 Between-groups differences in level of education (in percent)

Figure 4 displays the trichotomous variable "Level of education", which was used in computing the scale "Total Score Education". While a similar percentage of women and men graduated from elementary school, gender differences are very obvious in the other two categories, indicating lower levels of education among female diabetics of Turkish origin.

Similar results can be seen in Figure 5 which displays reading skills of the respondents, in which women and men differ significantly in their ability to read.

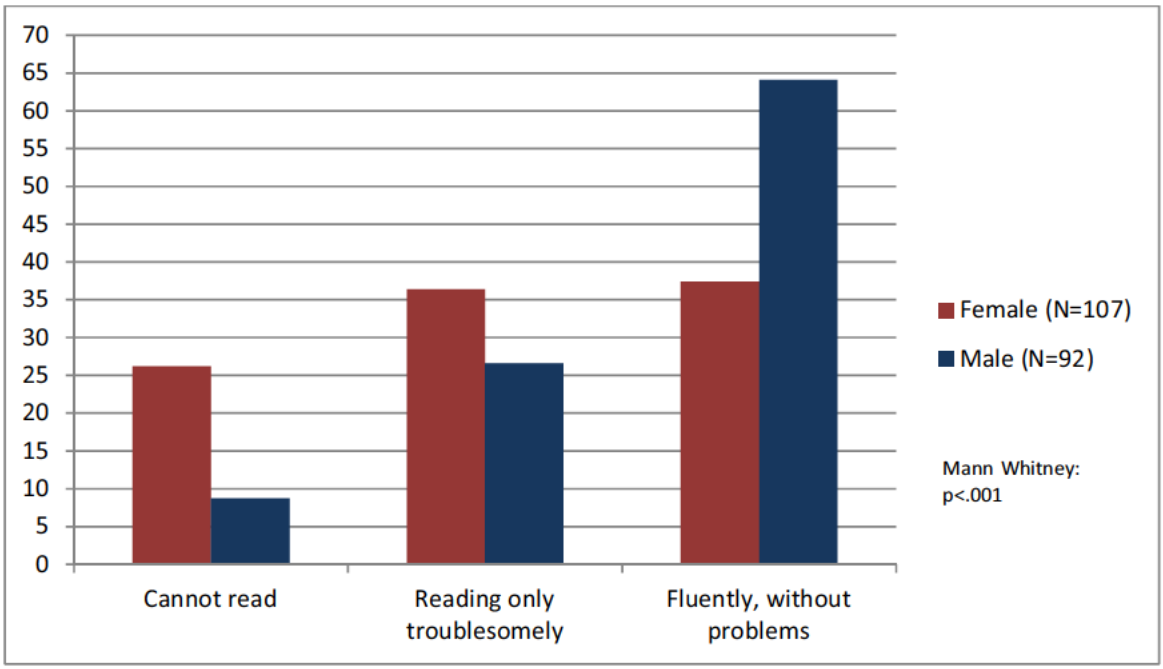


Figure 5 Between-groups differences in reading ability (in percent)

Considering the variable "Language Skills", women and men did not significantly differ from each other. The majority was either not able to understand the German sentence at all that was read to them by the interviewer, or understood some words but not the overall meaning. Only about 28% of all participants were able to give a fluent and correct repetition in Turkish.

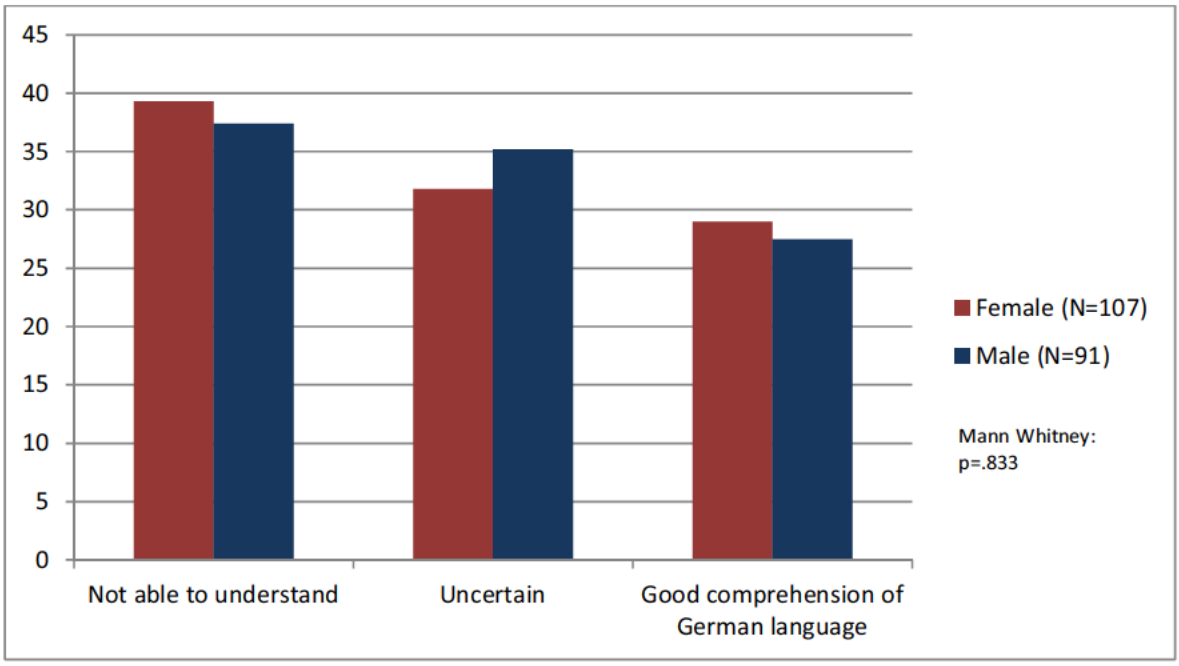


Figure 6 Between-groups differences in speech comprehension (in percent)

5.3 Disease-related Data

The following Table 5 shows data either directly linked to the disease diabetes (for example insulin therapy or participation in the Diseases Management Program) or data displaying general health-related behavior as the frequencies of doctors' visits.

Of the 203 participants of this study, 125 stated that they have taken part in diabetes training, while 75 answered in the negative. Of those 75 who have not participated in training, 15 had received their diagnosis either in 2007 or 2008. Considering that the study has only started in February 2008, these participants probably just had not had the chance to participate in any training.

Besides a few exceptions, there are no significant differences between female and male participants. Looking at the length of time since the diagnosis of diabetes (mean), women have been diagnosed earlier and are less insulin dependent (%) than men. The differences in these two variables are not statistically significant though. It is noteworthy that women's mean BMI exceeds men's by about three points. Each participant's weight fluctuation has also been computed in deducting the respective declaration of weight at t_0 from the current weight at t_1. Overall it reveals that women have slightly gained weight during the twelve months while for men the contrary is the case. The difference is only minor though, and not statistically significant. The variable displaying whether or not participants took part in a Diseases Management Program (DMP) shows slight differences between the sexes. This statement can only be made with reservation, though. Many participants (20% of men, 8% of women) do not know about their participation in a DMP, and when dichotomizing the variable, the answers "Do not know" and "No" had been combined in previous analyses. There were no gender differences considering the participation in diabetes training. Most participants went to group sessions which were held in Turkish language, and the majority of women and men stated that they benefited well from the training. Still more than one third of respondents were not able to derive a sufficient benefit from the training. An additional variable in the context of treatment is the manageability of self-treatment, which is not displayed in the table. About 60% of the participants experience self-treatment as rather easy, while 20% state that it is difficult to very difficult. Women and men did not differ significantly in the experience of self-manageability of their disease (Mann-Whitney: p=.307) and the overall contentment with treatment of the disease is given.

Table 5 Between-groups comparison of disease-related data

	Female	Male	Total	p
Length of time since diagnosis of disease (Mean)	10.06 yrs.	8.82 yrs.	9.47 yrs.	.148[(1)]
Insulin Therapy	39.4%	47.8%	43.3%	.232[(2)]
Duration of Insulin Therapy				
In years	7.1	5.4	6.2	.173[(3)]
BMI (Mean)	34.09	30.97	32.62	**.002**[(1)]
Difference in body weight (mean kg)	0.30	0.16	0.08	.372[(1)]
Doctors' Visits (Mean)				
Family Doctor	10.47	8.17	9.42	**.022**[(1)]
General Practitioner	12.93	13.00	12.94	.579[(1)]
Visits to Medical Specialists (Mean)				
Diabetologist	5.15	5.19	5.17	.704[(1)]
Ophthalmologist	2.56	2.29	2.43	.204[(1)]
Internist	4.27	3.59	4.00	.799[(1)]
Cardiologist	2.36	1.82	2.09	.745[(1)]
Pulmonologist	3.00	2.33	2.75	.623[(3)]
Nephrologist	3.80	1.20	2.50	.249[(3)]
Orthopaedist	5.98	6.97	6.41	.779[(1)]
Dermatologist	5.00	3.00	4.00	.365[(3)]
Neurologist	5.00	3.08	4.28	.083[(1)]
Otolaryngologist	2.86	2.20	2.47	.293[(3)]
Podiatrist	4.85	6.29	5.67	.324[(1)]
Self examination of feet	3.05	2.87	2.97	.777[(2)]
Dentist	2.34	3.29	2.72	**.049**[(1)]
Urologist	3.44	2.46	2.46	.443[(2)]
Gynaecologist	2.05		2.05	
Score on diabetes knowledge test	3.90	3.76	3.83	.550[(1)]
Disease Management Program	40.4%	37.4%	39%	**.034**[(2)]
Participation in Training	62.0%	61.7%	61.9%	.961[(2)]
Type of Training				
Group Session	89.4%	87.7%	88.6	.958[(2)]
Single Session	7.6%	8.8%	8.1%	
Both	3.0%	3.5%	3.3%	
Language of Training				
German	31.8%	36.3%	33.9%	.070[(2)]
Turkish	66.7%	53.4%	60.5%	
Both	1.5%	10.3%	5.6%	
Benefit from the Training				
A lot to very much	60.6%	65.5%	62.9%	.572[(2)]
Little to not at all	39.4%	34.5%	37.1%	
In Need of more Training				
No	32%	48.3%	39.6%	**.023**[(2)]
Yes	68%	51.7%	60.4%	
Contentment with Treatment				
Content	78.5%	78.7%	78.6%	.970[(2)]
Discontent	21.5%	21.3%	21.4%	

[(1)]Mann Whitney; [(2)] χ^2 test; [(3)] t test

5.4 Health Behavior

Table 6 gives an overview on selected variables displaying health behavior (physical activity, smoking, alcohol consumption) and nutrition behavior. The between group comparisons which include data from both assessments show significant differences of smoking behavior (at t_0), alcohol consumption, and frequency of physical activity between male and female respondents. The number of smokers among men has decreased over time, while some women seem to have picked up a smoking habit. At the same time, a decline of women's physical activity can be registered, while men's physical activity has increased. There is no change in the significance difference in alcohol consumption; though it is to note that the overall consumption of alcoholic beverages is generally low.

Both groups of respondents do not significantly differ considering their nutritional behavior. The selected few variables which reflect eating habits show that the general consumption of sweets and sugared tea or soft drinks is rather low, while fruit and vegetables are consumed often. Wilcoxon signed rank tests have been computed to test for significance of longitudinal changes in related samples. Only the increased consumption of sugared tea among men attained statistical significance (p=.004).

Table 6 Between-groups comparison of health behavior

Lifestyle Factors:	t_0				t_1			
	Female	Male	Total	p	Female	Male	Total	p
Smoking	14%	28.7%	20.9%	**.014**[(2)]	15.6%	22.3%	18.7%	.279[(2)]
Mean Consumption of Alcohol [(4)]	1.02	1.64	1.31	**<.001**[(1)]	1.04	1.53	1.27	**<.001**[(1)]
Mean Frequency Physical Activity[(3)]	2.84	2.60	2.73	.249[(1)]	2.95	2.25	2.63	**.003**[(1)]
Nutrition: Mean consumption of:	Female	Male	Total	p	Female	Male	Total	p
Fruit[(3)]	1.33	1.35	1.34	.702[(1)]	1.41	1.34	1.38	.328[(1)]
Vegetables[(3)]	1.28	1.26	1.27	.605[(1)]	1.33	1.25	1.29	.204[(1)]
Cakes/Sweets[(3)]	4.05	3.81	3.94	.351[(1)]	3.96	3.86	3.91	.893[(1)]
Saccharated soft drink[(3)]	4.43	4.35	4.40	.462[(1)]	4.50	4.22	4.37	.211[(1)]
Sugared tea [(3)]	3.80	3.35	3.60	.119[(1)]	4.20	4.03	4.13	.715[(1)]

[(1)]Mann Whitney; [(2)] Fisher's Exact Test; [(3)] Five categories from 1 "daily" to 5 "less than once a month";
[(4)] Six categories from 1 "never" to 6 "almost daily"

5.5 Diabetes Literacy

Based on a few selected questions of the diabetes-knowledge test developed by the German Diabetes Center Düsseldorf (DDZ), the participants' disease-related knowledge was tested. As shown in the preceding Table 5 (disease-related data), the knowledge about the illness does not significantly differ between female and male patients. This result also asserts the outcome of another question which requested the self-assessment of diabetes-related knowledge. Results can be seen in Table 7.

Table 7 Between-groups comparison: Self-Assessment of Diabetes-Literacy (N=203) t_0

		Not very good	A little	Quite good	Very good
Self-Assessment	♂	40.4%	28.7%	21.3%	9.6%
	♀	36.7%	34.9%	22.0%	6.4%

There were no significant differences between men and women in self-assessed diabetes knowledge (χ^2 p=.699).

When asked about their own assessment of diabetes knowledge, the majority stated to have rather little or not very good understanding of the illness (~ 72% of women, ~ 69% of men). This is also reflected in the replies given to another question, when the participants were asked to explain the disease in their own words. About 42% of the women and 47% of the men were not able to give an explanation, 39% (respectively 47% for men) of the women could only partially reply to this question.

No significant gender differences were found in the ability to explain the disease (χ^2: p=.522).

Despite the rather poor overall self-assessment of knowledge and explanation of diabetes in both groups, more women than men stated that they are in need of further training.

This initiates additional analysis of the data available on the perceived benefit women and men obtain from the diabetes training. Table 5 (Disease-related data) shows that of those who took part in training, the majority (62.9%) stated that they derived a benefit from it. A χ^2-test did not reveal any differences between men and women.

5.6 Quality of Life

In the following section, results of the self-assessed QoL of Turkish diabetics in Hamburg are displayed. In Tables 8 and 9, the between-groups differences of QoL on the different WHOQOL BREF subscales are shown.

While men score significantly higher on the WHOQOL BREF subscales "Physical Health", "Psychological Health", and "Environment", there is no significant difference in the subscale

"Social Relationship" at t_0. Both groups achieve high scores on this subscale, although the values of t_1 have to be looked at with reservations due to the missing item "Sexuality". Still the result is quite positive and could be explained with close family ties, stable social networks through mosque associations or good relationships in the neighborhood.

Table 8 Between-groups differences on WHOQOL BREF subscales t_0

WHOQOLbref Subscale	Female Participants			Male Participants				
	Mean	SD	N	Mean	SD	N	p (2-tailed)	N
Physical Health	11.54	3.06	107	13.97	3.01	93	**<.001**[(1)]	200
Psychological Health	12.17	3.24	108	14.09	3.15	93	**<.001**[(2)]	201
Social Relationships	13.98	3.20	107	14.49	2.69	93	.388[(1)]	200
Environment	13.79	2.51	108	15.06	2.35	92	**<.001**[(1)]	200

[(1)] Mann-Whitney, [(2)] t-test

At t_1, there are only significant between-group differences on the subscales "Physical Health" and "Psychological Health". Self-assessed QoL considering physical health has deteriorated in both groups, while women rate their psychological health higher compared to the baseline assessment.

Table 9 Between-groups differences on WHOQOL BREF subscales t_1

WHOQOLbref Subscale	Female Participants			Male Participants				
	Mean	SD	N	Mean	SD	N	p (2-tailed)	N
Physical Health	11.26	3.36	109	13.20	3.45	94	**<.001**[(1)]	203
Psychological Health	12.56	3.12	108	13.98	3.08	94	**.001**[(2)]	202
Social Relationships	15.09	3.31	108	15.59	2.93	92	.300[(1)]	200
Environment	14.40	2.44	109	14.88	2.30	94	.118[(1)]	203

[(1)] Mann-Whitney, [(2)] t-test

In order to be able to detect the items which led to the improvement of perceived QoL of women, single WHOQOL BREF-items have been analyzed. In the following Table 10, mean values for single items split by sex, as well as the computed delta-values are displayed. Negative delta-values again indicate a decrease in Quality of Life over the course of time in the respective item. To test for statistical significance, Mann-Whitney- or independent-samples t-tests have been applied were appropriate.

Table 10 Differences in Quality of Life – Between-groups differences of single items at t_0 and changes within groups over time

WHOQOL-Bref 26 t0	*Female* (N=107-109[1])		*Male* (N=91-94[1])		*Mann-Whitney*		Δ (t_1-t_0)		
Scale for Single Items: 1-5	**Mean**	**SD**	**Mean**	**SD**	**p**	**N**	**Female**	**Male**	**p**
How would you rate your Quality of Life?	3.22	.09	3.53	0.76	**.009**	202	.06	-.14	.239[3]
How satisfied are you with your health?	2.69	1.04	3.37	1.03	**< .001**	203	.18	-.19	**.021**[3]
To what extent do you feel that physical pain prevents you from doing what you need to do?	3.18	1.16	2.26	1.16	**< .001**	203	.02	.22	.240[3]
How much do you need any medical treatment to function in your daily life?[*]	3.17	1.27	2.51	1.24	**< .001**	202	.44	.32	.899[3]
How much do you enjoy life?	3.19	1.24	3.71	1.06	**.003**	203	.17	.06	.487[3]
To what extent do you feel your life to be meaningful?	3.31	1.12	3.68	0.97	**.027**	200	.21	.04	.409[3]
How well are you able to concentrate?	2.70	1.15	3.21	1.06	**.001**	202	.25	-.04	.053[3]
How safe do you feel in your daily life?	3.07	0.96	3.42	0.86	**.018**	198	.26	-.04	**.048**[3]
How healthy is your physical environment?	3.23	0.93	3.55	0.78	**.008**	203	.14	-.07	.207[3]
Do you have enough energy for everyday life?	2.83	0.95	3.33	0.97	**< .001**	203	-.10	-.14	.795[3]
Are you able to accept your bodily appearance?	3.06	1.07	3.47	1.03	**.005**	198	-.10	-.25	.263[3]
Have you enough money to meet your needs?	2.83	1.04	3.01	1.06	.210	203	-.03	-.10	.428[3]
How available to you is the information that you need in your day-to-day life?	3.56	0.94	4.03	0.85	**< .001**	198	.23	.00	.086[3]
To what extent do you have the opportunity for leisure activities?	3.37	1.04	3.62	1.19	.082	203	.28	.04	.075[3]
How well are you able to get around?	3.17	1.06	3.51	0.95	**.015**	201	-.25	-.31	.596[3]
How satisfied are you with your sleep?	2.47	1.26	3.52	1.17	**< .001**	201	.24	-.24	**.015**[3]
How satisfied are you with your ability to perform your daily living activities?	3.01	1.02	3.49	0.90	**< .001**	200	.05	-.14	.231[3]
How satisfied are you with your capacity for work?	3.09	1.09	3.41	1.00	**.026**	200	-.02	-.05	.934[3]
How satisfied are you with yourself?	3.29	1.01	3.66	1.04	**.007**	201	-.10	-.27	.384[3]
How satisfied are you with your personal relationships?	3.80	0.87	3.91	0.72	.541	201	.07	.08	.976[3]
How satisfied are you with your sex life?	2.70	1.21	3.17	1.01	**.008**	172	-	-	-

WHOQOL-Bref 26 t0	*Female* (N=107-109[1])		*Male* (N=91-94[1])		*Mann-Whitney*		Δ (t_1-t_0)		
Scale for Single Items: 1-5	**Mean**	**SD**	**Mean**	**SD**	**P**	**N**	**Female**	**Male**	**p**
How satisfied are you with the support you get from your friends?	3.79	1.05	3.74	0.90	.431	199	-.11	.02	.383[(3)]
How satisfied are you with the conditions of your living place?	3.73	1.09	3.82	1.03	.630	199	-.15	-.14	.771[(3)]
How satisfied are you with your access to health services?	3.91	0.89	4.29	0.81	**.001**	199	.22	.01	.156[(3)]
How satisfied are you with your transport?	3.93	1.01	4.33	0.79	**.003**	199	.21	.02	.102[(3)]
How often do you have negative feelings such as blue mood, despair, anxiety, depression?	3.27	1.14	2.57	1.27	< **.001**	199	-.12	-.25	.424[(3)]
WHO subscale physical health (ranging from 4-20)	11.54	3.06	13.97	3.06	< **.001**	200	-.30	-.82	.164[(2)]
WHO subscale psychological (ranging from 4-20)	12.17	3.24	14.09	3.15	< **.001**	201	.35	-.16	.205[(2)]
WHO subscale social relationships (ranging from 4-20)	13.98	3.20	14.49	2.69	.388	200	1.08	1.10	.962[(2)]
WHO subscale environment (ranging from 4-20)	13.79	2.51	15.06	2.35	< **.001**	200	.59	-.18	**.016**[(2)]

[(*)] Scale indicates a negative assessment; [(1)] Except Item no 21 where N=86 in both groups; [(2)] Independent samples t-test; [(3)] Manny-Whitney U-test

Summarizing Table 10, it can be said that women underwent a positive development in their self-assessed QoL, while men's results remained either stable or slightly decreased. This is especially true for the environmental subscale of the WHOQOL BREF. Three out of the eight items of this scale have been rated higher by the women when comparing t_0 with t_1: safety in daily life, healthy physical environment, and access to health services.

The slight improvement on the psychological subscale among women can partially be ascribed to the better rating of the single items "meaningful life" and "ability to concentrate".

5.7 Dependency and Social Support

A person's overall well-being is also influenced by the degree to which she or he is able to perform (Instrumental) Activities of Daily Life ([I] ADL) independently. In this framework, perceived social support is a crucial factor.

The following Table 11 displays the dependency in several domains of daily life as well as the (I) ADL total-score (higher scores indicating higher degrees of dependency). Females state higher dependencies in each of the domains when compared to men. Especially the differences in outdoor activities and finances attain statistical significance.

Table 11 Between-groups comparison: Need of support and care

	t_0				t_1			
(I) ADL-domains	**Female**	**Male**	**N**	**p**	**Female**	**Male**	**N**	**p**
House-keeping	36.1 %	25.3 %	199	.100[(1)]	45.0 %	33.0 %	203	.082[(1)]
Personal Care	17.6 %	14.9 %	202	.605[(1)]	25.0 %	17.2 %	201	.179[(1)]
Outdoor Activities	56.5 %	26.6 %	202	**<.001**[(1)]	63.0 %	28.0 %	201	**<.001**[(1)]
Mobility	22.0 %	11.7 %	203	.052[(1)]	33.3 %	16.3 %	200	**.006**[(1)]
Health Care	16.5 %	13.8 %	203	.596[(1)]	25.0 %	13.0 %	200	**.033**[(1)]
Finances	50.5 %	32.6 %	201	**.011**[(1)]	60.4 %	42.4 %	198	**.012**[(1)]
(I)ADL-total (0-6; Mean)	1.98	1.24	203	**.001**[(2)]	2.49	1.48	203	**<.001**[(2)]

[(1)] χ^2 test, [(2)] Mann Whitney

Comparing the need of support at baseline with the follow-up assessment, it can be seen that women's dependency has even increased.

Looking at the availability of help in Table 12, there are no differences between female and male diabetics; the overall immediate availability of help is very good with 78.4%. But there are also 8 % who cannot rely on any help, and the percentage of disadvantaged women is almost twice as high compared to men in this category.

Table 12 Availability of help t_0

Help available	Female (N=106)	Male (N=93)	Total (N=199)	p (2-tailed)
"No, could not find anybody"	10.4%	5.4%	8.0%	
"Yes, but with some difficulties"	12.3%	15.1%	13.6%	.395(1)
"Yes, easily"	77.4%	79.6%	78.4%	

(1) χ^2 test

The analysis has been repeated for the second survey, and again there seem to be no gender differences between the participants. On the one hand, the number of women and men stating that they could not find anybody has been decreasing. On the other hand though, the number of respondents who can find help easily has also decreased. Again, women seem to have greater difficulties to receive the support they need. The difference in availability of help (t_1-t_0) has been computed and revealed that 16 men experienced a decrease in availability of help, while 9 reported an improvement. For women, the availability of help has decreased in 22 cases and improved in 15.

Table 13 Availability of help t_1

Help available	Female (N=108)	Male (N=92)	Total (N=200)	p (2-tailed)
"No, could not find anybody"	6.5%	3.3%	5.0%	
"Yes, but with some difficulties"	26.9%	23.9%	25.5%	.479(1)
"Yes, easily"	66.7%	72.8%	69.5%	

(1) χ^2 test

Interestingly, while there seem to be no gender differences in the overall availability of help at both measurement points, women and men differ significantly when asked for the perceived support by their families at t_0. The overall availability of familial support is decent with 59.1%, but looking at the results split by sex, it is revealed that the percentage of females that cannot or only insufficiently rely on support by family members is more than twice as high as the percentage of men in this category.

Table 14 Support by family t_0

Availability of support	Female (n=106)	Male (n=92)	Total (N=198)	p (2-tailed)
"Not at all or seldom"	21.7%	8.7%	15.7%	
"Mostly yes"	28.3%	21.7%	25.3%	**.009**(1)
"Yes, could not be better"	50.0%	69.6%	59.1%	

(1) χ^2 test

When this question is prompted again twelve months later, no significant gender differences occur (see Table 15). The computed difference in availability of support (t_1-t_0) showed no change for the majority of participants, regardless of their sex. Still, for 25 female participants the situation worsened, while this is only the case for 20 of the male participants. On the contrary, it can be seen that the circumstance improved in 23 cases among women, and only in 10 cases among men.

Table 15 Support by family t_1

Availability of support	Female (n=107)	Male (n=92)	Total (N=199)	p (2-tailed)
"Not at all or seldom"	18.7%	14.1%	16.6%	.129[(1)]
"Mostly yes"	33.6%	23.9%	29.1%	
"Yes, could not be better"	47.7%	62.0%	54.3%	

[(1)] χ^2 test

5.8 Education, Marital Status, Religiosity, and HLC in the Context of QoL

The following tables display the correlations of education, religiosity, and marital status with the respective subscales of Quality of Life not controlling for any other variables. For education (Table 16) this results in partial significant correlations, especially in the group of male participants (Spearman's rho up to .39), while among women the level of education does not seem to be significantly related to their subjective Quality of Life.

Table 16 Correlation between level of education and Quality of Life among female and male diabetics

	Level of Education: none, elementary school, at least 8 years								
	Female Participants			Male Participants			Total		
	rho	p	n	rho	p	n	rho	p	N
WHO Subscale Physical Health	-.002	.987	107	.390	**<.001**	93	.279	**<.001**	200
WHO Subscale Psychological Health	-.002	.984	107	.295	**.004**	93	.212	**.003**	201
WHO Subscale Social Relationships	-.051	.600	107	.212	**.042**	93	.078	.275	200
WHO Subscale Environment	-.048	.622	108	.163	.120	92	.129	.068	200

Although the overall correlations are rather weak, there seems to be a positive relationship between religiosity and the subscale of social relationships. This accounts especially for female diabetics of Turkish origin.

Table 17 Correlation between religiosity and Quality of Life among female and male diabetics

	Religiosity: 5-point Likert-Scale not religious – very religious								
	Female Participants			Male Participants			Total		
	rho	p	n	rho	p	n	rho	p	N
WHO Subscale Physical Health	-.066	.529	94	-.060	.621	70	-.023	.768	164
WHO Subscale Psychological Health	.181	.080	94	.167	.168	70	.189	.015	164
WHO Subscale Social Relationships	.259	**.012**	93	.065	.590	70	.177	**.024**	163
WHO Subscale Environment	-.113	.279	94	.225	.061	70	.175	**.025**	164

While the marital status does not seem to correlate with perceived QoL of men, there is a significant correlation between perceived environmental QoL and marital status for female participants. As

already stated in the beginning, women are living on their own significantly more often than men. Furthermore, female participants show significantly higher dependencies in the variables "Outdoor Activities", "Mobility", and "Finances" than men (see Table 11), which could explain this significant correlation.

Table 18 Correlation between marital status and Quality of Life among female and male diabetics

	Marital Status: no partner vs. cohabiting								
	Female Participants			Male Participants			Total		
	rho	**p**	**n**	**rho**	**p**	**n**	**rho**	**p**	**N**
WHO Subscale Physical Health	.150	.122	107	.085	.418	93	.211	**.003**	200
WHO Subscale Psychological Health	.054	.581	108	.133	.204	93	.144	**.041**	201
WHO Subscale Social Relationships	.057	.559	107	.033	.755	93	.057	.424	200
WHO Subscale Environment	.209	**.030**	108	.011	.916	92	.193	**.006**	200

In Tables 19 and 20, correlations between single Health Locus of Control items and Quality of Life on the different subscales are displayed. Unfortunately, a lack of answers in several HLC items inhibited the computing of a scale. This is why the item "First and foremost, my health is determined by what I am doing" stands exemplarily for internal HLC, while the item "My health is mainly an aspect of predisposition and luck" stands for external HLC.

There are weak, but significant correlations between psychological and mental well-being and internal HLC.

Table 19 Correlation between internal Health Locus of Control and Quality of Life among female and male diabetics t_1

	Health Locus of Control: My health is determined by myself 5-point Likert-Scale: 1 strongly agree- 5 strongly disagree								
	Female Participants			Male Participants			Total		
	rho	**p**	**n**	**rho**	**p**	**n**	**rho**	**p**	**N**
WHO Subscale Physical Health	-.156	.107	108	-.030	.775	94	-.116	.101	202
WHO Subscale Psychological Health	-.219	**.023**	107	-.118	.259	94	-.169	**.017**	201
WHO Subscale Social Relationships	-.209	**.031**	107	-.095	.367	92	-.169	**.017**	199
WHO Subscale Environment	-.062	.526	108	-.054	.608	94	-.063	.371	201

The correlation between Quality of Life subscales and external Health Locus of Control does not yield any significant results as displayed in Table 20 below.

Table 20 Correlations between external Health Locus of Control and Quality of Life among female and male diabetics t_1

	Health Locus of Control: My health is an aspect of luck 5-point Likert-Scale: 1 strongly agree- 5 strongly disagree								
	Female Participants			Male Participants			Total		
	rho	**p**	**n**	**rho**	**p**	**n**	**rho**	**p**	**N**
WHO Subscale Physical Health	.051	.599	108	.112	.281	94	.093	.188	202
WHO Subscale Psychological Health	.005	.963	107	-.061	.562	94	.002	.979	201
WHO Subscale Social Relationships	.061	.531	107	.168	.109	92	.116	.102	199
WHO Subscale Environment	.140	.159	108	.018	.862	94	.100	.156	201

Although it is not directly in the context of Quality of Life, the question of how the level of education and the intensity of religiosity are related to each other came up during these analyses. Table 21 gives an overview on the correlation coefficients split by sex.

Table 21 Correlations between level of education attained and intensity of religiosity t_0

	Religiosity: 5-point Likert-Scale not religious very religious								
	Female Participants			*Male Participants*			*Total*		
	rho	**p**	**n**	**rho**	**p**	**n**	**rho**	**p**	**N**
Level of Education: None, Elementary School, at least 8 years of education	-.168	.105	94	-.392	**.001**	70	-.233	**.003**	164

While the attained level of education is not significantly correlated with the sense of religiosity among women, the opposite is true for men. The inverse correlation coefficient indicates that male diabetics of Turkish origin are either less religious the higher their educational degree, or, the other way around, that especially men with lower educational levels exhibit strong feelings of religiosity.

5.9 Enrollment in the Disease Management Program and QoL

As it is shown in Table 5, there were no significant gender differences in the contentment with treatment in general. Still, it was of interest whether satisfaction with treatment differs between participants who are enrolled in the DMP and those who are not or do not know. In this context, a χ^2–test was performed and the result was significant (p=.004), indicating that those who participate in the DMP are more content. This led to further analysis of self-assessed Quality of Life in the context of being enrolled in the DMP or not, the results are displayed in the following Tables 22 and 23.

Table 22 Between-groups differences in QoL DMP vs. non-DMP t_0

	DMP				Non-DMP			
	Female (Mean)	Male (Mean)	N	p	Female (Mean)	Male (Mean)	N	p
WHO Subscale Physical Health	11.53	13.47	76	**.005**[(1)]	11.54	14.19	121	**<.000**[(1)]
WHO Subscale Psychological Health	12.36	13.53	76	.175[(1)]	12.05	14.35	122	**<.000**[(1)]
WHO Subscale Social Relationships	13.78	14.16	76	.590[(1)]	14.11	14.53	121	.772[(1)]
WHO Subscale Environment	14.00	15.21	75	**.024**[(1)]	13.65	14.94	122	**.004**[(1)]

[(1)]Mann-Whitney

Table 23 Between-groups differences in QoL DMP vs. non-DMP t_1

	DMP				Non-DMP			
	Female (Mean)	Male (Mean)	N	p	Female (Mean)	Male (Mean)	N	p
WHO Subscale Physical Health	10.87	12.92	78	**.009**[(1)]	11.53	13.40	122	**.001**[(1)]
WHO Subscale Psychological Health	12.69	13.55	78	.374[(1)]	12.47	14.33	121	**.001**[(1)]
WHO Subscale Social Relationships	14.82	15.25	78	.623[(1)]	15.28	15.80	121	.356[(1)]
WHO Subscale Environment	14.27	14.74	76	.410[(1)]	14.49	15.11	122	.174[(1)]

[(1)]Mann-Whitney

Looking at the results of female diabetics of Turkish origin, they seem to slightly benefit from an enrollment in the DMP in terms of self-perceived QoL on many subscales, compared to not being enrolled. Interestingly, while women seem to benefit from the enrollment in the DMP in terms of health-related QoL, they achieve higher scores on the scale of social relationships when not being enrolled in the DMP. For male diabetics of Turkish, almost the opposite is the case. Besides one exception (environmental subscale at t_0), men's mean scores on all subscales of QoL are better when they are not enrolled in the DMP.

5.10 Effects on Quality of Life

In order to analyze different effects on QoL when controlling for socio-demographic variables, different linear regression models have been computed for each WHOQOL BREF subscale. The models all contain the variables sex, age, education, and financial difficulties in making co-payments for medication (ranging from 1 "very or rather difficult" to 3 "rather not difficult or not difficult at all"). Furthermore, varying additional determinants "Availability of help", "Support by family", as well as "Dependency in (I) ADL" are included in different models. Model 4 depicts the results of the regression analysis when all variables are entered simultaneously.

Table 24 Influences on QoL Subscale Physical Health t_0 (linear regression analysis, beta coefficients)

Variables	Model 1	Model 2	Model 3	Model 4
Age in years	-.142	-.167*	-.016	-.002
Sex: female (↑) vs. male (↓)	-.344***	-.327***	-.239***	-.214***
School-education: 3 categories, low to high	.012	.021	.012	.020
Financial difficulties in making co-payments: 3 categories high to low	.242***	.229**	.143*	.129**
Availability of help: 3 categories, low to high	.205**			.095
Support by family: 3 categories, low to high		.153		.038
Dependency in (I)ADL (higher = worse)			-.590***	-.562***
n	147	146	150	146
R^2	.296	.268	.533	.590

* p ≤ .05; ** p ≤ .01; *** p ≤ .001

In Model 1, sex and financial difficulties exert the most prominent influence on physical health, followed by the availability of help. When support by family is entered in Model 2, it does not attain statistical significance, sex and finances remain the most prominent influencing factors. This changes in Modell 3, when the dependency in (I) ADL is entered which exerts a highly significant effect. While sex also remains highly significant, the effect of financial difficulties is weakened.

In Modell 4, when all variables are entered simultaneously, dependency in (I) ADL, sex, and financial difficulties exert the main influence on self-perceived QoL on the subscale of physical health.

Table 25 Influences on QoL Subscale Psychological Health t_0 (linear regression analysis, beta coefficients)

Variables	Model 1	Model 2	Model 3	Model 4
Age in years	-.001	-.018	.132	.104
Sex: female (↑) vs. male (↓)	-.248**	-.212*	-.161*	-.126
School-education: 3 categories, low to high	.117	.135	.113	.134
Financial difficulties in making co-payments: 3 categories high to low	.132	.112	.046	.037
Availability of help: 3 categories, low to high	.134			.004
Support by family: 3 categories, low to high		.177		.123
Dependency in (I)ADL (higher = worse)			-.465***	-.434***
n	147	146	150	146
R^2	.149	.154	.302	.306

* p ≤ .05; ** p ≤ .01; *** p ≤ .001

Regarding the results on the subscale of psychological health, the variable sex exerts significant influence on the self-perceived psychological well-being. This effect is slightly weakened in Model 2, when the variable support by family is entered. When dependency is entered in Model 3, it attains high statistical significance, but there still also is a significant effect of sex. This changes in Model 4, when dependency in (I) ADL remains as the only significant variable exerting influence of self-perceived psychological well-being.

Table 26 Influences on QoL Subscale Social Relationships t_0 (linear regression analysis, beta coefficients)

Variables	Model 1	Model 2	Model 3	Model 4
Age in years	-.060	-.077	-.012	-.026
Sex: female (↑) vs. male (↓)	-.053	-.018	-.046	.012
School-education: 3 categories, low to high	-.043	-.021	-.071	-.023
Financial difficulties in making co-payments: 3 categories high to low	.182*	.184*	.165	.154
Availability of help: 3 categories, low to high	.320***			.206*
Support by family: 3 categories, low to high		.314***		.196*
Dependency in (I)ADL (higher = worse)			-.217*	-.133
n	146	145	159	145
R^2	.161	.155	.094	.207

* p ≤ .05; ** p ≤ .01; *** p ≤ .001

The most prominent effects on the subscale social relationships are exerted by its components "Availability of help" and "Support by family" in Models 1 and 2. However, when all variables are entered in Model 4, the effect of these two variables is weakened, although they still attain statistical significance.

Table 27 Influences on QoL Subscale Environment t_0 (linear regression analysis, beta coefficients)

Variables	Model 1	Model 2	Model 3	Model 4
Age in years	-.006	-.039	.101	.088
Sex: female (↑) vs. male (↓)	-.244***	-.166*	-.192**	-.082
School-education: 3 categories, low to high	-.016	.023	-.027	.022
Financial difficulties in making co-payments: 3 categories high to low	.241***	.215**	.181*	.139*
Availability of help: 3 categories, low to high	.356***			.129
Support by family: 3 categories, low to high		.455***		.341***
Dependency in (I)ADL (higher = worse)			-.482***	-.415***
n	147	146	150	146
R^2	.292	.350	.361	.513

* p ≤ .05; ** p ≤ .01; *** p ≤ .001

The most prominent effects on the environmental subscale of self-perceived QoL in Model 1 are exerted by financial difficulties, availability of help, and sex.

The effects of sex and financial straits are weakened when support by family is entered in Model 2; they still attain statistical significance though. In Model 3, dependency in (I) ADL exerts the most prominent influence. In Model 4, the components dependency and support by family are highly significant, followed by financial straits as a significant influencing factor.

This multivariate analysis has also been computed for data raised at t_1. For clarity, the different models are not displayed here, but differences to t_0 are described.

Regarding the subscale physical health, the former significant predictors sex, financial straits, and dependency do not exert a significant influence anymore, the only significant predictor for QoL when all factors are entered simultaneously at t_1 is the dependency in (I) ADL (β=-.532, p<.0001).

There is no change of effects on the subscale of psychological health, while in the model regarding social support the significant effect of the variables support by family and availability of help wear off. Instead, the dependency in (I) ADL attains statistical significance when all variables are entered simultaneously (β= -.346, p=.021).

The fourth model analyzing influencing factors on the environmental subscale of QoL does not show a significant effect of the variable perceived support anymore. Instead, the variable age attains statistical significance (β=.268, p=.040). There is no notably change in the variances explained by the models.

6. Summary and Discussion of Results

This study of gender differences in the life and care situation among Turkish diabetics in Hamburg shows that women and men differ significantly in several aspects.

Regarding the description of the sample (Table 3) it can be seen that men are living in a partnership significantly more often than women, the number of female respondents who are either widowed or separated from their partners exceeds men by far. Nonetheless there are significantly more children living in women's household. Depending on the age of the children this could imply an additional burden for women to meet all the demands imposed on them. Furthermore, the beneficial aspect of living in a partnership has been found in several studies. Trief et al (2001) examined that better marital satisfaction is related to less diabetes-related distress and better general Quality of Life. Steinbach (2009) examined the division of household work among Turkish and German couples and came to the result that Turkish husbands support their wives very much in household chores. Although there might be a stronger traditional component among Turkish couples, the share of work does not differ from German couples. So in addition to the emotional support a good relationship provides, there is also the fact that accruing work is bisected between the partners. There is no doubt that managing everything herself imposes stress on a single mother.

The single status of women also implies a financial risk. Different studies on elderly migrants report that women have usually not been in employment contracts and have to rely on their husbands' or families' financial support when growing old. Given the situation that most male economic workers were employed in jobs which did not require any special training, the pensions are very low, also resulting in minimal widows' annuities (Özcan 2005; Razum et al. 2008). Living on the subsistence minimum is a great stressor which can also exert influence on self-assessed Quality of Life.

The majority of respondents are speaking Turkish at home, which accounts for significantly more women than men. Both groups of respondents did not perform well on German comprehension tests. According to the literature, little knowledge of German language is common among economic workers of the "first generation". This is has not only been problematic during their work life as it has assigned employees with a migrant background a marginal, badly paid position on the labor market. Lacking linguistic proficiency is also an obvious barrier for elderly migrants when seeing their doctor. It is prerequisite for the physician to make a correct diagnosis on the one hand, but also necessary for a full comprehension of and adherence to treatment on behalf of the patient on the other hand. Özcan et al. (2005) found that proficiency of German language can even decrease with age. This can have a negative impact on psychological health and lead to a lack of confidence when moving in a linguistically unfamiliar environment. Additionally, Michaela Özelsel (1999); cited in Borde et al. (2002) found that verbal speechlessness can be expressed psychosomatically by some female migrants. Acvi (2004) has described how important speech comprehension is, especially among patients with chronic conditions which necessitate a high degree of communication. Understanding

creates appreciation and a trustworthy doctor-patient-relationship, which in return might raise compliance and also subjective well-being.

In this context, the level of education is of particular importance. Different studies and reports found that especially migrants of Turkish origin have lower educational levels than all other groups of migrants (Noll 2011), and that women of Turkish decent are usually less educated than men. This corroborates the findings of this study, where women did not attain any form of graduation or only elementary school degree significantly more often than men, who are higher educated. With increasing age, the level of education is decreasing among both genera, and the quota of illiteracy among women of Turkish origin was about 7.4% in 2008 (Menning & Hoffmann 2009). Regarding the quote of analphabetism, and the high amount of those who only possess minimal reading and writing ability, the spoken word attains special importance.

Many elderly migrants have to rely on family members to act as interpreters, and the perceived dependency can be burdensome. This study found that women state a significantly lower self-assessed Quality of Life on the environmental subscale at baseline, and they experience significantly greater dependency on the (I) ADL domain "outdoor activities". On the one hand this might be explained with language barriers; on the other hand it could also originate in the traditional role women of first generation economic migrants still impersonate. These traditional role models of being a housewife and mother have changed over time, as Ataman stated in her article from 2007. By now, young women of Turkish origin are better educated than men, and about one third is in an employment contract. Still, young women of Turkish origin who strive for good occupational positions on the labor market have to encounter many barriers. This has also been described by Färber et al. (2008), who say that stereotypes and prejudices among employers still inhibit migrant women's acquirement of an appropriate position despite their good or very good education.

Considering the lifestyle factor smoking, the results of this work resemble those of other studies. Men smoke significantly more often than women of Turkish origin. This has also been described in Razum et al. (2008). There is a negative trend considering women's physical activity which is in conformity with the increase of BMI. As the nutritional behavior of female respondents does not seem to have changed, the decreased or total lack of physical activity can be one reason for the weight gain. However, there might also be a possible bias of social desirability when answering lifestyle-questions. But it is also imaginable that women just do not have the means to prepare diabetic meals for themselves every day. In the study population, women are usually responsible for preparing the food for the whole family. They might encounter the difficulty of having to prepare two meals as their families do not want to eat "diabetic food". This could be an additional, time-consuming stress factor for the women, and also exceed the family's financial means, which then results in just preparing one "normal" meal for all members of the family. This has also been reported by Hübner et al. (2008). They found that diabetic women of Turkish origin primarily adjust to the demands of their spouses and sons when preparing meals.

There were no gender differences among the respondents when asked for their diabetes literacy, contentment with treatment, benefit from diabetes training, and manageability of self-treatment. This allows the conclusion that diabetic patients are treated equally regardless of their sex. Another analysis revealed between-groups differences in the satisfaction with treatment when the respondents are separated into DMP versus non-DMP. Further analysis in this context on perceived QoL among DMP-members and non-members showed that female respondents benefited from enrollment considering their mental health. Those who participate in the DMP achieved higher mean scores on the respective subscale. Interestingly, the opposite was the case among men: their mean scores of QoL on all subscales were higher when not enrolled in the DMP. Similar results were found by Miksch et al. (2008) in a study which examined data of a big German insurance company. They reasoned that this might have something to do with different ways of explaining the genesis of disease. While men describe rather physical causes for diabetes or illness in general, women tend to pursue a more holistic approach and embed their condition in a psychosocial context. Being enrolled in the DMP, where the participants thoroughly deal with their disease seems to have gender-specific differences in impact on QoL. Another aspect could be that providing respondents with additional information leads to a feeling of safety among women, and they felt better cared for the more they knew about their own disease. This can also be true for the perceived benefit of and need for further training.

The self-assessed diabetes knowledge was similarly low among all participants and the majority stated that they were able to derive a benefit from diabetes training. Nevertheless, there were significantly more women than men who stated that they are in need of further training. This might again have something to do with greater feeling of safety the more information is present. According to Hübner & Huth (2008) female Turkish diabetics often feel left alone when it comes to their disease. So additional training might offer women the possibility to meet like-minded persons and feel understood. Other reasons could be that the acceptance of disease could be greater among women or that female respondents might find it helpful to get together in group training, talk about their disease and socialize this way, while men in general are not very talkative when it comes to their state of health.

Regarding self-assessed QoL it is found that women achieve lower mean values on three of the four subscales when compared to men at t_0. Only in the aspect of social support there are no significant differences, both groups of respondents seem to have a sufficient social network of friends and families. This has also been described in various literatures (e.g. Schopf & Naegele 2005; Özcan & Seifert 2005). Although elderly migrants might be in a worse socio-economic position than indigenous people of the same age, they cannot be called helpless or isolated as they have stable familial networks. The respondents reported to have approximately three to four children and about five to seven grandchildren and there is great intra- and intergenerational support and solidarity. It can be assumed that due to their similar experiences of migration and living and working situation in Germany, elderly migrants and their families form a group which is very community-conscious and

caring. However, one cannot assume ongoing support by family members per se. The living and working situations among younger generations of migrant background have changed compared to the elderly of the first generation. While it once was taken as given that the daughter is taking care of her parents as they grow older, young women today feel the strain of meeting different requirements. On the one hand, many are in employment contracts and seek a good career; on the other hand, they very often have their own children and families to take care of. Additionally providing for their parents or in-laws imposes a double or triple burden. It is to be pointed out again though, that the expressiveness of the subscale social support can be limited, as it is only comprised of three items at t_0, respectively two items at t_1.

On the one hand, there are very positive aspects about close family ties and social networks. On the other hand it has been found that this can have a negative impact on psychological well-being as the patient is in fear of being watched constantly, and that loved-ones worry because of the disease (Hübner & Huth 2008).

The results show significantly higher grades of dependency in most (I) ADL domains for women compared to men at both measurement points. Women also have significantly more problems to find the support they need, despite the good results on the WHOQOL BREF subscale social support at t_0 and t_1. This could have a major impact on the subjective psychological well-being, and when comparing mean values of male and female respondents, it is to note that women perform significantly worse at both time points.

Acvi (2004) also found worse psychological health among female respondents compared to men. In the study on well-being and satisfaction with treatment among Turkish diabetics, women reported significantly more often negative feelings and symptoms of depression.

When comparing mean values of the WHOQOL BREF subscales between women and men over the course of the study, one has to say that men's values exceed those of women's all the time. It is noteworthy that female respondents underwent a positive development on the environmental subscale. They feel safer in daily life and experience a better access to health services as well has a physically healthier environment. Possible reasons for this positive development are not clear. Maybe dealing intensively with the own disease and gaining further information via the DMP, the doctor's office or other sources of information led to an improved QoL. This would not be applicable for those not in the DMP though. One might also assume that there is greater serenity among the elderly. In the process of ageing and living with a chronic disease, one might become reconciled to the situation and set other priorities.

Regarding the correlations between education, marital status, and religiosity with QoL (not controlled for any other variables), the results also indicate gender differences. There is a significant positive correlation of educational level with QoL among men, while there does not seem to be any association among women. Social inequality is a social determinant of health, and the connection between low socio-economic status - for which educational level serves as one indicator - and early mortality has

been reported in other literature. Similar gender differences have been found by Undén and Elofsson (2006): educational level was strongly correlated to self-rated health among men, but not in women. It is possible that all the underlying facets connected to a low level of education, such as bad jobs or bad housing conditions work together and lead men to rate their self-assessed QoL worse, while among women, other things negatively influence their QoL.

When correlating the degree of religiosity with the different WHOQOL BREF subscales, no significant correlations for men were found. For women there is a significant, positive correlation between religiosity and the subscale social support. On the one hand, religiosity and faith might act as partial mediators among the female respondents. This has also been found by Kirchner et al. (2010). The stronger women's feeling of faith, the less stress and depression they reported. This could not be found among men. On the other hand, the results emphasize the importance of religiosity for social support and well-being of women, not their physical or psychological status. Attending services and/or being in mosque associations seem to have a different meaning and importance for women than men. Islamic services are often separated by gender, and it is possible that they enjoy socialization with other women and being able to communicate.

There were also gender differences in the correlations of marital status and the WHOQOL BREF subscales. While women's well-being on the environmental subscale significantly correlated with their marital status (rho= .209), there were no associations for men. The experienced constraints by women in their environmental QoL have been discussed before. Female respondents show higher levels of dependency compared to men, and being married or cohabiting might ease the burden of having to get along in a strange environment. Additionally, women with a Turkish migrant background are less often in an employment contract than men, at least among the elderly. This implies a heavy financial burden on single women, which can also deteriorate self-assessed environmental QoL.

The correlations between QoL and two exemplarily chosen aspects of internal and external Health Locus of Control only lead to minor significant results. Considering the QoL subscales of psychological health and social support, the results indicate that women do not feel to have the power to change the situation. On the one hand, this might be simply the truth among the population of this study, depending on whether certain mental states are actually diagnosed which impede one's own influence; on the other hand it is rather possible that the data set is very subject to limitations considering HLC. The question of how religiosity and level of education are related came to the result that the lower the educational level among men, the higher the sense of religiosity (or the other way around), while there were no significant results among women. It is possible, that the higher men's level of education, the more they feel being capable to control and steer a certain situation. Well-educated men receive good occupational positions, thus experience financial stability, and feel confirmed. In turn, minor education with all its socioeconomic consequences can lead to feelings of uncertainty and poverty, and a lack of information could intensify the impression of helplessness and inability to control living and environmental conditions. This might especially affect men, who feel

responsible for their families' well-being. Not being able to serve as provider and protector might lead to a loss of self-esteem and amplify the experienced environmental burden. In consequence, men might seek safety and regulation in religiosity. In the contrary, women do not seem to condition their sense of religiosity on the level of education. Their religion may be a constant companion in their lives and does not depend on external factors, or women possibly derive strength and safety from other things than purely religion. Although the correlational results convey first impressions they have to be looked at with reservation. The study is limited as one has to assume that there are other indirect, mediating effects on self-assessed QoL which are not further addressed here.

The results of the regression analyses do not differ from other gerontological research findings. Especially the dependency in one or more domains of the (I) ADL has a strong impact on self-assessed QoL (except on the subscale social relationships), and also support by family and availability of help are very important influencing factors. The fact that experiencing financial difficulties also attains statistical significance in many models elucidates the precarious situation some migrants are in.

It is interesting that age is positively associated with the psychological and environmental domains of QoL, while there is a negative association on the subscale of social relationships. The former could again indicate a greater composure and a more positive philosophy of life which might come along with ageing, while the latter leads to the conclusion that the older our respondents become, the more difficulties they experience to get the help they need and to maintain social contacts.

Gender is negatively associated with all domains of self-assessed QoL, with the exception of social relationships. This corroborates the other findings which show lower self-assessed QoL among female respondents.

The regression analyses convey first impressions of influencing factors on self-perceived QoL of migrant diabetics, but the results are still limited. The validity of the variable "Financial difficulties in making co-payments" for example needs to be discussed. Unfortunately, the household equivalent income could not be computed from the present data. Furthermore, there might be other mediating and moderating factors of QoL in this subgroup, which were not considered in the analysis. For more detailed results, the computation of a statistical equation model could be helpful.

This study is probably the first in Hamburg analysing the situation of diabetics of Turkish origin under consideration of gender aspects. Although the sample size is quite small, it can be regarded as representative for the population of Turkish migrants suffering from diabetes, which allows for an important insight in the living- and care situation. However, the small sample size can be unfavourable when stratifying the data according to sex, as it results in even smaller subgroups.

The cross-sectional character of this analysis allows verifying associations, but no causalities or chronology can be proved. It is not known whether women actively changed their situation and thus improved their self-perceived QoL over time, or whether this due to any other measures or merely coincidence.

7. Solution Approaches

The analysis of the living and care situation of Turkish women and men suffering from diabetes mellitus type 2 led to various results, many of them underlining the adverse position of elderly persons with a migrant background in terms of health, health literacy, and Quality of Life, especially among female respondents. However, there are also positive changes over the course of time, and the presence of protective and strengthening factors can be assumed.

Bearing in mind an intersectional approach can be beneficial when analyzing gender differences in this vulnerable subgroup of the population, although in this study in particular, the requirements to perform a quantitative analysis under aspects of intersectionality cannot be met. The population under study has a very similar background, and only the situations of Turkish women and men are checked against each other. In terms of intersectionality, it would be highly interesting to compare the position of a Turkish woman of low socioeconomic status to the position of an upper-class male, born and raised in Germany, to expose the different intersectionalities in the life of a female migrant of Turkish origin.

However, the intersectional approach in the context of this study paves the way for a better understanding of the live and care situation of female migrants, and referring to the ecosystemic framework presented in Chapter 2.2, solution approaches on the different levels are presented in the following.

On the individual level, the low level of education is one of the most problematic factors which influences health literacy and dealing with a chronic disease like diabetes. Diabetes training is offered by many diabetologists, and when the patient is enrolled in the DMP, many information materials are provided. However, the materials still need to be adapted more to level of education and speech comprehension. It could be helpful to bundle all relevant information in Turkish language, which is adapted to lower levels of education, and hold it available at relevant places where Turkish men and women socialize. Furthermore, as the spoken word attains main importance among those who are illiterate, it could be necessary to rethink the ways of training. Nowadays, every household owns a television and a DVD player. Maybe short movies with diabetes and health related information as well as cooking recipes contributes to better diabetes literacy. The results of the study show that women express a higher need for training. This could be encountered with training sessions exclusively for women where they can meet in an informal atmosphere and discuss diabetes related aspects and improve their health literacy. It is also of great importance to improve the general literacy of women and to create offers which empower women not only in health-related aspects, but in various matters of life.

On the micro-level of family and close friends, the patient needs to experience positive feelings and support. Getting the family to act in concert can prove to be difficult, especially when it comes to shared meals or being physically active. Maybe possibilities offered in the following meso-level can be designed to address the whole family, achieving a better understanding of the importance of certain

alterations in the lifestyle of the person concerned among family members. The empowerment of women affected by diabetes, as described above, could also allow for better support and understanding among family members. The more confidence the female patient generates, the higher the chance that she establishes her own issues within the circle of family and friends.

On the meso-level, many different actors come into play, offering some possibilities to implement low-threshold measures to improve the situation of chronic patients such as diabetics. For example, in neighborhoods with a high population of migrants, insurances could consider to set up an advisory group or some other form of educational measure. This could take place in cooperation with other social contact points or places of integration, which are already present in the area. Namely these social contact points could consider expanding their offers for female migrants. It could be of particular interest to offer programs to them which are led by women of a similar migrant background, which can enhance understanding and trust, and group leaders might also serve as role models. On the one hand, measures like these are convenient, as the place is already available. On the other hand, it requires comprehensive information of health insurances and providers of social contact points, as well as financial means. Only then it would be possible to extend existing offers to a medical information center.

As the religious life is of special importance to (elderly) migrants of Turkish origin, and mosque associations and culture centers are commonly used for socialization, one could think about cooperation with imams. Other than in Lutheran or Catholic services, various topics are brought up by the imam at the mosque, and as he is a much respected person, he discussing aspects of health can sensitize the community.

In terms of health care, several matters are of interest when it comes to the health of diabetics with a migrant background. One concept that is widely used and known in Germany, but barely recognized in the Turkish community, is the concept of self-help. The formation of a group by persons who are affected by a certain disease with the aim to share and receive information and experience understanding and support is popular in Germany, but not in Turkey. So although there is no existing self-help group for Turkish diabetics in Germany today, maybe the next generation that is already more acquainted with German healthcare customs and practice will make a difference in this aspect.

The medical care of patients with a migrant background also offers a scope for improvement. To achieve good medical results, understanding and compliance are indispensable. But very often, deficiencies on both sides hinder a good quality of care. On behalf of the patient, there are very often language barriers, hindering a detailed expression of medical problems. Medical providers are often restricted by time limits, only having a few minutes for each patient. So when the communication does not work in an instant, there is the danger of undersupply or inappropriate health care, simply because the patient is not understood. Additionally, there can be cultural differences or concealed racial discrimination which impedes the care of migrant patients. So on the one hand, health care providers in Germany are still requiring more intercultural training. On the other hand, patients of migrant

background are in need of a possibility to express their health issues and feel understood. Of course, family members can function as interpreters. But maybe some things are better discussed in the discretion of a doctor-patient relationship, without letting the family know about it instantly. There is also the possibility of doctor's assistances serving as interpreter, when they are of the same origin as the patient. But especially when it comes to treatment options or pre-operation discussions, precise vocabulary is necessary for correct understanding. This could be achieved with the concept of *medizinisch-sozialen Dolmetschern*, a German term for "medical-social interpreters". Up till now, there are not many of these especially trained interpreters, and the development of a consistent training for interpreters for medical purposes on national level would be helpful.

Furthermore, it is to note that migrant women might not feel comfortable when treated by a male practitioner. The concept of health centers exclusively for women needs to be widened, especially since there is only little information on their existence and where to find them.

Another measure which could assist medical providers could be an "information map" for doctors. It is no issue if a medical provider does not feel prepared for a certain diabetic patient, as long as he or she knows where to send the patient to.

These are all arrangements that could be made on the meso-level to improve health outcomes for diabetics of migrant background. However, one has to bear in mind the costs, which are associated with it. The patients in this study, who already have financial problems in making co-payments for medications, would need offers that are either for free or available at a minimum expense. It is also conceivable that little incentives are necessary to attract diabetics of Turkish origin to participate in certain programs.

The matters of coordinating and financing these measures extend to the macro-level of health, social, economic and educational politics. Although the mindset of intersectionality is comparatively new, there are some scholars who address the implementation of an intersectional approach into politics, which could also be applicable in Germany. So far, policy approaches have been of rather additive nature, starting with one identity category such as gender, and then adding others. This is inadequate when there are layered relationships between social inequalities. In their research Hankivsky & Cormier (2010), describe different approaches to applying intersectionality to policy development and highlight the importance of a more complete analysis that is given by incorporating an intersectional stance in politics. The challenge now is to persuade policy makers to make use of this possibility to take more effective and responsible decisions. This would lead to a better understanding of inequities in health and lay the foundation for targeted measures to alleviate those, possibly improving health outcomes of the population in Germany, regardless of gender, migrational background, or socioeconomic position.

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Statutory Declaration

I declare that I have authored this thesis independently, that I have not used other than the declared sources / resources, and that I have explicitly marked all material which has been quoted either literally or by content from the used sources.

…… ……..

Date Signature

Annex I

I. Data related to Figures 4-6
II. Vote of the Ethic Committee
III. Informed consent
IV. Patient information
V. Questionnaire

Annex II

Please see CD-ROM for electronic supplement, containing SPSS Syntax and Output for all analyses. Content is not to be published!

Data related to Figures 4-6

Table 1Between-groups differences in level of education

	Female (n=109)	Male (n=94)
No graduation	34.9%	11.7%
Elementary school	46.8%	54.3%
At least 8 years of education	18.3%	34.0%

Table 2 Between-groups differences in reading ability

	Female (n=107)	Male (n=92)
Cannot read	26.2%	8.7%
Reading only troublesomely	36.4%	26.6%
Fluently, without problems	37.4%	64.1%

Table 3 Between-groups differences in speech comprehension German

	Female (n=107)	Male (n=91)
Not able to understand	39.3%	37.4%
Uncertain	31.8%	35.2%
Good comprehension of German	29.0%	27.5%

Table 4 Test statistics Figures 4-6

	Level of education	Reading ability	Speech comprehension
Mann-Whitney U	3630.5	3411.5	4847.5
Wilcoxon W	9625.5	9189.5	10625.5
Z	-3.897	-4.074	-.056
Asymp. Sig. (2-tailed)	.000	.000	.956

ETHIK-KOMMISSION DER
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06.10.2008

Bearb.-Nr.: **PV3061 (Bitte stets angeben!)**
Studie: Gesundheitskompetenz von türkischstämmigen Diabetikern in Abhängigkeit von Krankheitsverlauf, Versorgungskonzept, sozioökonomischem Status und Integration

Sehr geehrter Herr Kofahl,

den Eingang Ihrer Schreiben vom 18.09.2008 und 06.10.2008 (per Fax) mit Ihrer Stellungnahme und den darin enthaltenen revidierten Studienunterlagen bestätigen wir hiermit.

Die Auflagen der Ethik-Kommission sind nunmehr erfüllt, ein zustimmendes Votum kann somit erteilt werden (Anlage).

Mit freundlichen Grüßen

U. Kucharzeck

i.A. Uta Kucharzeck
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Sehr geehrter Herr Kofahl,

über Ihr oben bezeichnetes, zur Primärberatung vorgelegtes Projekt hat die Ethik-Kommission ausführlich beraten.

Das Vorhaben entspricht den berufsrechtlichen bzw. gesetzlichen Anforderungen. Die Ethik-Kommission stimmt dem Vorhaben zu.

Die Kommission weist darauf hin, dass die Verantwortung des Versuchsleiters für das Forschungsvorhaben und seine Durchführung durch das obige Votum der Kommission nicht berührt wird.

Sie werden gebeten, die Ethik-Kommission über alle schwerwiegenden oder unerwarteten Ereignisse, die während der Studie auftreten und die die Sicherheit der Studienteilnehmer gefährden, in Verbindung mit Ihrer Stellungnahme zu unterrichten.
Die Kommission geht davon aus, dass die personenbezogenen Daten der Probanden/ Patienten den datenschutzrechtlichen Vorschriften entsprechend behandelt werden.

Die Ethik-Kommission erwartet, dass ihr nach Abschluss des Projektes unaufgefordert ein Abschluss-Bericht übersandt wird (unter Angabe der Bearb.-Nr.), aus dem der Erfolg/Misserfolg der Studie sowie Angaben darüber, ob die Studie abgebrochen oder geändert bzw. ob Regressansprüche geltend gemacht wurden, ersichtlich sind.

Mit verbindlicher Empfehlung
Im Auftrage der Kommission:

Prof. Dr. med. Th. Weber
- Vorsitzender -

P.S. Die Ethik-Kommission arbeitet auf der Grundlage deutschen Rechts und Berufsrechts sowie in Anlehnung an die ICH-GCP

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Forschungsvorhaben „Gesundheitskompetenz von türkischstämmigen Diabetikern“

Yapılacak araştırma: „Türk kökenli diyabet hastalarının sağlık yeterliği“

Einverständniserklärung für Patientinnen und Patienten

Ich wurde über das oben genannte Forschungsprojekt vom Institut für Medizin-Soziologie und meinem Arzt ausreichend schriftlich und mündlich informiert.

Ich bin mit folgendem Vorgehen einverstanden:

Befragung meines Hausarztes oder Facharztes über wichtige Untersuchungsergebnisse (z.B. Bluthochdruck, Diabetes-Werte) und Übermittlung der Informationen an das Institut für Medizin-Soziologie.

Kontaktierung durch einen Interviewer des Instituts für Medizin-Soziologie zwecks Vereinbarung eines Termins für die Hauptbefragungen.

Insgesamt zwei Befragungen im Abstand von 12 Monaten durch Mitarbeiter/innen des Instituts für Medizin-Soziologie in meiner Wohnung (oder auf Wunsch an einem anderen Ort).

Befragung einer von mir angegebenen Vertrauensperson, falls Informationen ergänzt werden müssen.

Ich bin damit einverstanden, dass die im Rahmen der wissenschaftlichen Untersuchung über mich erhobenen Krankheitsdaten sowie meine sonstigen mit dieser Untersuchung zusammenhängenden personenbezogenen Daten ohne Namensbezug unter einer ID-Nummer erfasst und ausgewertet werden. Es wird gewährleistet, dass meine personenbezogenen Daten nicht an Dritte weitergegeben werden. Bei der Veröffentlichung z.B. in einer wissenschaftlichen Zeitschrift wird aus den Daten nicht hervorgehen, wer an dieser Untersuchung teilgenommen hat.

Hastanın Kabul Beyanı

Tıp Sosyolojisi Bölümü ve ev doktorum tarafından yapılacak olan yukarıda sözü edilen araştırma konusunda yazılı ve sözlü olarak yeterince bilgilendirildim.

Aşağıdaki yapılacakları kabul ettiğimi beyan ediyorum:

Ev doktoruma veya uzman hekimlere muayene sonuçlarının sorulması (yüksek tansiyon, şeker seviyesi gibi) ve bu bilgilerin Tıp Sosyolojisi Bölümüne verilmesi.

Tıp Sosyolojisi Bölümünden bir röportajcının ana anket soruları için benimle bir randevu yapmak üzere beni araması.

Tıp Sosyolojisi Bölümü çalışanlarının benim evimde (veya arzu edilirse başka bir yerde) 12 ay arayla toplam iki defa anket yapması (sorular yöneltmesi).

Tamamlayıcı bilgiler gerekmesi halinde, tarafımdan belirlenecek güvenilir (tanıdığım) bir kişiye de sorular yöneltilmesi.

Bilimsel araştırma çerçevesinde benimle ilgili toplanan hastalık verilerinin ve yine hastalığım kapsamındaki kişisel bilgilerin ismim olmadan, bir kimlik numarası altında kaydedilmesini ve değerlendirilmesini kabul ediyorum. Şahsımla ilgili bilgilerin üçüncü kişilere verilmeyeceği garanti edilecek. Örneğin bir bilimsel dergide yayınlanması halinde bu verilerden araştırmaya kimin katıldığının anlaşılması mümkün olmayacak.

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ERROR: undefinedresource
OFFENDING COMMAND: findresource

STACK:

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