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Yiatrosafia yia ton Anthropon: Indigenous Knowledge of Medicinal, Aromatic and Cosmetic (MAC) Plants in the Utilisation of the Plural Medical System in Pírgos and Práitoria for Community Health Development in Rural Crete, Greece

Aiglsperger, J.

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Chapter III RESEARCH METHODOLOGY

Although the ethnomedical approach forms an effective strategy towards the study of transcultural patterns of health care utilisation behaviour as well as towards the promotion of community health, particularly on the basis of a plural medical system operating in the research community, it has remained rather challenging to translate the theoretical implications involved into an appropriate research methodology. Indeed, patterns of health care utilisation behaviour are influenced by a number of individual, namely cultural, social and situational, characteristics of the local population as well as by the institutional features of the health care delivery apparatus at work within the community. The research methodology applied to the present study has been designed and selected in a way to relate the individual characteristics of the local population and the institutional features of the health care delivery system to patterns of health care utilisation (*cf.* Slikkerveer 1990; 2006).

Overall, this research follows the ‘Leiden Ethnosystems Approach’ to the study of people’s behaviour, which allows for a rather detailed analysis of the point of view of the participants, the cultural characteristics of the research area and the historical processes involved in current behavioural patterns. The ‘Leiden Ethnosystems Approach’ relates to the multidimensionality of different models of health care utilisation, which have been developed and designed in an attempt to explain patterns of utilisation behaviour on the basis of individual, institutional or organisational factors. In this way, the present study adopts the so-called multivariate model of transcultural health care utilisation, which has been adapted from previous research conducted on patterns of behaviour in different sectors of the society and across a variety of geographical areas. According to Slikkerveer (1990: 7), the multivariate model of transcultural health care utilisation serves the purposes of both ; *‘accommodating a number of predisposing and enabling factors together with perceived morbidity and, secondly, taking into account the role of the plural character of available forms of health care utilisation behaviour’*.

In order to gather data on the basis of the ‘Leiden Ethnosystems Approach’ and the multivariate model of transcultural health care utilisation, the present study employs a, demonstrably profitable, combination of qualitative and quantitative research methods. As Bernard (2002: 364) notes: *‘Ethnography and survey data combined produce more insight than either one alone’*. Following the selection and construction of the research instruments, a pilot study has been carried out in October 2009, which served the identification of the research area or field, the selection of the sample population, the collection of in-depth information and the pre-testing of the quantitative questionnaire. The initial stages of fieldwork moreover included: the application for permission to conduct research at the authorities involved; acquaintance with the local language; the establishment of rapport with key-informants in the field; and the building of personal relationships with the respondents. Subsequently, large-scale qualitative research, which involved the methods of participant observation, spontaneous unstructured and semi-structured interviewing, as well as extensive note taking, has been conducted for a period of approximately ten weeks between October and December 2010.

The quantitative household surveys, which combined methods of formal interviewing on the basis of a questionnaire with the qualitative techniques, has been carried out over a period of three months between April and June 2011. Furthermore, a concluding period of six weeks spent in the field between May and June 2012 served the completion of both qualitative and quantitative research material (*cf.* Blum & Blum 1965; Balick & Cox 1996; Hahn & Inhorn 2009). Finally, the qualitative and quantitative collected data have been subject to specific processes of data analysis, whereby all quantitative information has been evaluated through the means of statistical data analysis, which ultimately generated a realistic assessment of people’s health care utilisation behaviour.

3.1 Choice of Research Strategies

3.1.1 The 'Leiden Ethnosystems Approach'

The 'Ethnosystems Approach' presented in the previous chapter introduced a new strategy towards the study of Indigenous Knowledge Systems (IKS) by linking the cognitive aspect of investigating local systems of knowledge, practice and belief to the behavioural components involved in dynamic processes of culture and knowledge exchange, as well as in the development of indigenous technologies. In this way, it is the overall aim of the 'Leiden Ethnosystems Approach' to develop practical models, which are designed for the study of cognitive factors in relation to patterns of behaviour and provide a sound basis for the integration of indigenous and international knowledge systems. The research strategies implemented in the disciplines of Anthropology and Development Sociology at the Institute of Cultural and Social Studies at Leiden University in The Netherlands during the 1970s provided an increased focus on the practical implications involved in the study of IKS, thereby laying the foundation for an ethnoscience-based research approach. In other words, the 'Leiden Traditions' of Development Sociology and Structural Anthropology proved useful for ethnoscientific research methods and techniques based on an *emic* research approach, which eventually resulted in the application of the so-called 'Leiden Ethnosystems Approach' to the study of IKS (*cf.* Slikkerveer 1989; Slikkerveer & Dechering 1995). The 'Leiden Ethnosystems Approach' has hereafter been applied to research conducted at Leiden University, which studies various IKS in relation to different social sectors, such as human health, agriculture, ecology, ethnobotany, social forestry, and communication across distinctive geographical areas (*cf.* Agung 2005; Ibui 2007; Djen Amar 2010; Leurs 2010; Ambaretnani 2012; Chirangi 2013).

In practice, the 'Leiden Ethnosystems Approach' follows three methodological principles: (1) the 'Participant's View' (PV); (2) the 'Field of Ethnological Study' (FES); and (3) the 'Historical Dimension' (HP). Firstly, the 'Participant's View' (PV) evolved from strategies adopted within the Leiden Tradition of Structural Anthropology and refers to the transformation of subjective perceptions and attitudes into an objective social system. The principle of the PV undertakes an assessment of local cosmovisions, philosophies of nature, attitudes, opinions, perceptions and decision-making systems within the greater context of a specific culture. The PV principle provides a non-normative, local assessment of indigenous systems of knowledge, practice and belief, thereby corresponding to an *emic* research approach from the standpoint of the participant. Secondly, the 'Field of Ethnological Study' (FES), similarly rooted in the Leiden Tradition of Structural Anthropology, evolved from field research carried out in Indonesia during the 1930s where pan-Indonesian elements have been identified throughout the Archipelago prompting researchers to adopt the concept of FES to refer to a particular geographical area with shared cultural features. The principle of FES can be compared to the notion of 'culture area', which allows for the comparison of cultural characteristics among different indigenous communities within the same region. This principle contributes to a rather realistic understanding of the research area in Crete. Thirdly, the 'Historical Perspective' (HP) has been adopted from the Leiden Tradition of Development Sociology, which studies the historical dimension of long-term developments and practical situations across societies. The principle of HP aims at the pre-contemporary analysis of recent phenomena in fields such as medicine, agriculture or natural resource management. Largely based on the close collaboration between anthropologists and historians, the HP facilitates the study of the origin and development as well as characteristics of dynamic processes such as migration, transculturation or acculturation (*cf.* Slikkerveer 1989; Slikkerveer & Dechering 1995; Slikkerveer 1999b). Overall, the 'Leiden Ethnosystems Approach' adopts both a vertical and a horizontal perspective and has demonstrated that it is a very useful instrument to study IKS in relation to patterns of behaviour in various sectors of the society, including human health.

For the purpose of the present research, the ‘Leiden Ethnosystems Approach’ has been applied to the study of IKS and to the subsequent analysis of behavioural patterns within the context of health care utilisation. Following the methodological principle of PV, the approach allows for a realistic assessment of local systems of knowledge, practice and belief related to concepts of health and healing within a particular community. Based on the ethnosystems methodology, it has been possible to quantify individual perceptions, cosmovisions, attitudes and opinions and to transform these into objective social factors, which can be studied for their influence on patterns of health care utilisation behaviour. The principle of FES highlights the extent to which common features of medical knowledge, practice and belief appear in the research area and indicate the borders of a culture area, which is determined by its common concepts of health and healing. Finally, HP forms an essential principle applied to the present study of patterns of health care utilisation, which have acquired a significant historical dimension following the long-established tradition of recorded medical practice, which has been influenced by numerous processes of transculturation in the research area (*cf.* Slikkerveer & Dechering 1995; Slikkerveer 1999b).

The ‘Leiden Ethnosystems Approach’ facilitates the particular study of patterns of health care utilisation by means of identifying a number of socio-cultural and historical factors, which can be analysed for their influence on people’s behaviour. Since the approach furthermore contributes to the establishment of a common ground for comparison between indigenous and international knowledge systems, its principles can be extended to the concept of medical pluralism in which traditional, transitional and modern medical systems are identified and compared. Eventually, the comparison between different medical systems further enhances the understanding of particular determinants of people’s health care utilisation behaviour. The ability to identify in a comparative way the possible factors, which influence local patterns of health care utilisation not only on an individual level but also on a system level, provides a sound basis to the ‘Leiden Ethnosystems Approach’ for the implementation of a practical model of health care utilisation (3.1).

3.1.2 The Multivariate Model of Transcultural Health Care Utilisation

The characteristics of the ‘Leiden Ethnosystems Approach’ correspond with the multidimensional approach to the study of determinants of health care utilisation, which has been advanced on the substantial evidence that people’s behaviour is influenced *i.a.* by a number of socio-cultural, economic and situational background factors. As Suchman (1965: 115) explains: *‘We hypothesize that the selection of the source of care will reflect the knowledge, availability, and convenience of such services and social group influences upon the individual’*. The individual has been identified as being related to both a physical and a social environment, whereby a state of illness and the subsequent patterns of illness behaviour provoke variations in both the physical and the social environment. Research has shown that the geographical distribution and aetiology of certain diseases, as well as the forms of health care delivery, including public health programmes, are determined by a select number of predisposing, contributing and precipitating social and socio-demographic factors (*cf.* Suchman 1963). Early approaches to the study of health care utilisation determinants have, however, have focused a rather isolated attention on the presumed influence of economic, socio-psychological, geographic and organisational factors (*cf.* Greenlick *et al.* 1968; McKinlay 1972; Slikkerveer 1990). Promoting a more comprehensive strategy, Greenlick *et al.* (1968) have combined social, attitudinal, economic and situational background characteristics as possible determinants of health care utilisation behaviour. As Greenlick *et al.* (1968: 298) theorise: *‘It is posited that different sets of background characteristics (independent variables) are significant determinants of medical care utilization (dependent variables) in different disease situations (intervening variables)’*. Similarly favouring a comprehensive approach, McKinlay (1972) stresses the importance of socio-demographic information, particularly the area of residence and occupation of each individual, and social-psychological factors referring to the individual’s knowledge,

opinion, attitudes, beliefs and cues as determinants of behavioural patterns. In this respect, Kleinman (1978) suggests that any model designed to compare medical systems needs to relate internal, namely psychophysiological, behavioural and communicative, factors to external, namely social, political, economic, historical, epidemiological and technological, factors.

Kohn & White (1976) in their elaborative research on *'Health Care: An International Study'* have similarly adopted a comprehensive approach to the study of health care utilisation behaviour in which individual determinants of behaviour are related to factors of the respective health care system in order to assess a wide range of possible behavioural patterns. Kohn & White (1976) have implemented a systems approach to the study of health care utilisation, whereby the individual is viewed as a psychobiological system, which interacts with a greater social system comprised of social roles. Consequently, people's response to ill-health is guided by individual perceptions and decisions, which combine experiences gained from the internal psychobiological system with the response received from the external social system (*cf.* Suchman 1965; Anderson *et al.* 1976; White *et al.* 1976). As Anderson *et al.* (1976: 11) indicate: *'Man's psychobiological system equips him to perceive and interpret information from his internal and external systems and to employ this information in decision making and the regulation of his behaviour'*. By consequence, the health care utilisation process has been interpreted as a series of interrelated stages, whereby the movement from one stage to the other is influenced by a number of factors (*cf.* Figure 3.1).

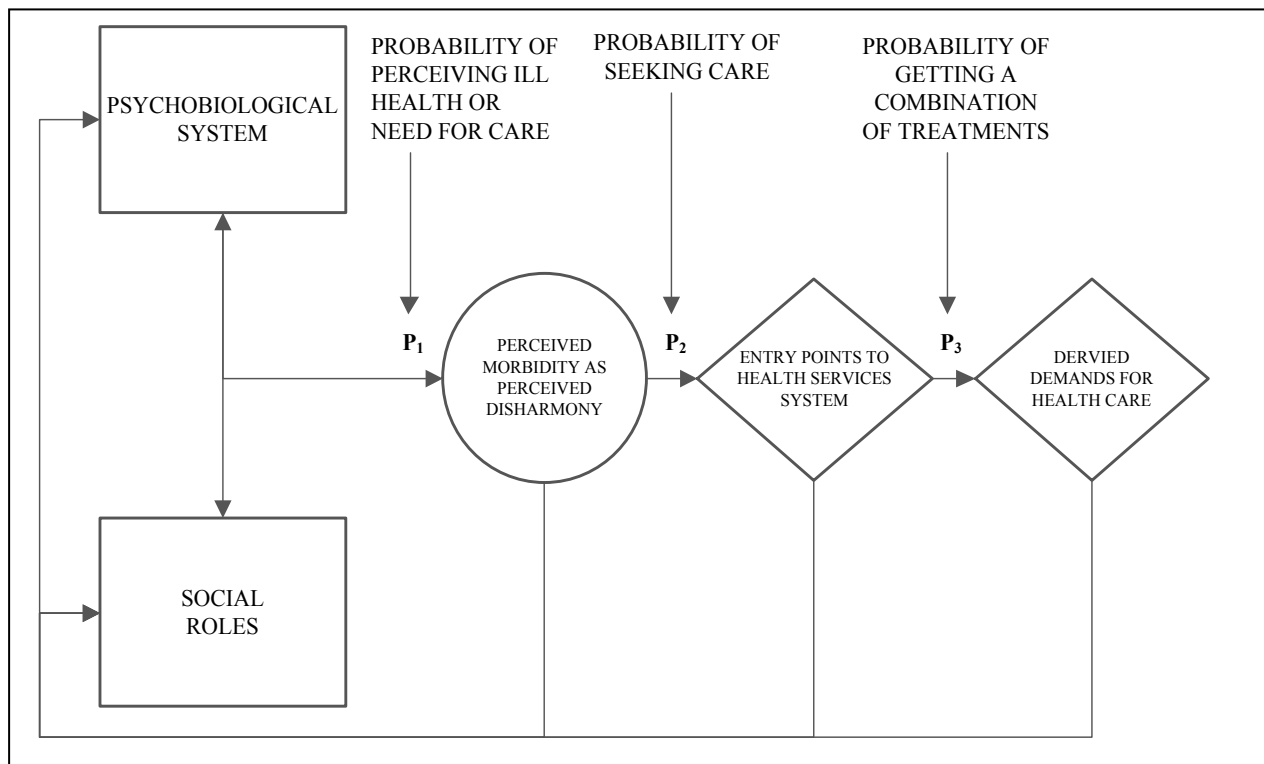


Figure 3.1 *Model of Stages in the Health Care Process*.

Source: Kohn & White (1976: 12).

The recognition of a state of disharmony by the individual following the evaluation of psychobiological and social disturbances has been defined as 'Perceived Morbidity' (PM), particularly the perception or interpretation of symptoms, which motivates individuals to seek medical care in the form of health care services utilisation, and introduces a change in the individual's social role. Hereafter, harmony is re-established by means of medical treatment sought from the health care system and in the form of social support provided by social services, which are directed at the reintegration of the individual into the society. As noticed by Anderson

et al. (1976: 17): '[...] [The] success of each health services system can be examined in terms of the correction of both deviance in social functioning and maladjustment in psychobiological functioning'. Since the individual and the social response to illness, however, vary over time, harmony is generally achieved through a regular revision of the health care system. Such revision involves the improvement of both the delivery of health services as well as the social conditions (*cf.* Anderson *et al.* 1976).

In view of the interrelated stages of the health care utilisation process, a number of factors influencing people's decision-making behaviour during the process can be identified and subsequently introduced into a comprehensive model of health care utilisation. In most studies, 'perceived morbidity' shows to be a significant determinant of patterns of health care utilisation, as according to Anderson *et al.* (1976: 12) it provides: '*the force, which initiates decision making about whether or not care should be sought*'. The choice of treatment is furthermore influenced by a number of individual, socio-cultural determinants, which refer to a variety of cultural and attitudinal concepts, which are brought into the model as 'socio-demographic' and 'psycho-social variables' (Barnes *et al.* 1999). In his study on patterns of use of alternative forms of medicine, conducted in the United States, Astin (1998: 1551), shows that people's decision-making behaviour is influenced by: '*distrust of conventional physicians and hospitals*'; '*desire for control over health matters*'; '*dissatisfaction with conventional practitioners*'; and '*belief in the importance and value of one's inner life and experiences*'. Similarly, several cost-related determinants, including people's socio-economic status (SES), which indicates the financial tolerability of the health care system for each individual, are identified and included in the model as 'enabling variables' (*cf.* Panagiotakos *et al.* 2008) (3.2). As Anderson *et al.* (1976: 14) mention: '*In addition to the cash outlays required under some systems for services and for related expenditures such as transportation, enabling factors include expenditures of energy and effort and losses due to absence from work or from other profitable or desirable activities*'.

In addition, patterns of health care utilisation are influenced by factors related to the structure, supply and underlying philosophies of each health care system. The source of medical advice and treatment, as they are administered by either professional health care providers, such as pharmacists and physicians, or by non-professional health care providers, including family members and friends, as well as external agents, such as media, appears to influence people's choice of treatment (*cf.* Simoens *et al.* 2009). Since these factors tend to function for all individuals at the system level, they affect the process of health care utilisation not only of each individual but also of the population at large, thereby showing behavioural variations among the community members. The perceived morbidity, socio-demographic, psycho-social, enabling and systems factors are inserted into the model of health care utilisation as independent variables influencing people's utilisation behaviour (*cf.* White *et al.* 1976; Anderson *et al.* 1976). The factors of the outcome of the health care utilisation process refer to the dependent variables in the conceptual model. Anderson *et al.* (1976: 12), observe that these factors are: '*expressed for the most part in this study as rates, of entering or contacting specific components of health services systems and the factors which may account for these probabilities*'. Utilisation of medical services is generally recognised in all societies by both the individual and the health care system as an appropriate variable to measure patterns of health care utilisation and delivery (*cf.* White *et al.* 1976). As White *et al.* (1976: 2) indicate: '*Use of a service is a major, tangible expression of the demand, if not the need, for that service, and of the system's responses to perceived needs and expressed demands*'.

On the basis of the earlier models of health care utilisation, which were designed by Greenlick *et al.* (1968) followed and elaborated by Kohn & White (1976), Slikkerveer (1990) introduces a rather comprehensive strategy towards the design of a model of health care utilisation, where he also adopts a systems approach to the study of patterns of utilisation behaviour. As Slikkerveer (1990: 69) argues: '*In the context of the systems approach referred to here, illness behaviour may be regarded as a process in which the individual using health care takes action to restore the balance both in his internal psycho-biological system and in the external social system*'.

In this way, the process of health care utilisation is characterised by the interplay of socio-demographic, socio-psychological, socio-cultural, economic, geographical and organisational factors and has to be studied in a rather holistic manner. Following previous research, it has been possible to, as stated by Slikkerveer (1990: 48), to: *'divide illness behaviour into a large number of stages and to use an extensive system of factors with a cyclical character'*. In particular, in his conceptual model the concept of perceived morbidity is identified as a socio-cultural determinant of people's behaviour during the assumption of the stage of the 'sick role' and as an influential factor in people's utilisation behaviour. As noticed by Slikkerveer (1990: 74): *'[...] [Perceived] morbidity is defined as the observation and interpretation of symptoms of illness which initiate the decision-making process of seeking and obtaining medical help'*. Here the 'Leiden Ethnosystems Approach' is applied as a useful means to quantify individual determinants of health care utilisation and to subsequently insert them as predisposing variables into the overall model, thereby creating a common ground for comparison between predisposing, enabling and system variables. As Leslie (1976: 7) explains: *'Recognition of the need to evolve conceptual models and to record data for the complex analyses that this subject requires is discouraged by pre-emptively labelling one set of institutions "scientific medicine"'*.

In addition, the concept of 'intervening variables' is introduced in order to include an additional - system-based - group of important factors within the model of health care utilisation. Based on the 'Leiden Ethnosystems Approach', Slikkerveer (1990) further operationalised and differentiated the dependent factors of health care utilisation for several medical systems - traditional, transitional and modern - in order to incorporate a differentiation between the available medical systems into the conceptual model. Since the utilisation rates as dependent variables embody more than a simple calculation of the number of contacts of 'patients' with any of the available medical systems but reflect both the extent and variety of the plural medical system used in interaction with the independent and intervening variables, Slikkerveer (1990) was able to construct the ultimate *Model of Transcultural Health Care Utilisation*.

The model of transcultural health care utilisation has since been successfully applied in behaviour-based studies in various sectors and research settings, most of which have been subject to historical processes of acculturation and transculturation, predominantly in developing countries. These studies include research on plural medical systems in the Horn of Africa by Slikkerveer (1990); the study of indigenous knowledge and change in African agriculture by Adams & Slikkerveer (1996); research on the conservation of bio-cultural diversity in Bali, Indonesia by Agung (2005); the development of a multivariate model of transcultural utilisation of Medicinal, Aromatic and Cosmetic Plants by Slikkerveer (2006); the study of systems of indigenous knowledge, practice and belief regarding the use of wild plants in Kenya by Ibui (2007); the study of indigenous communication on MAC plant knowledge and practice in Indonesia by Djen Amar (2010); research carried out on MAC plants for community health and bio-cultural conservation in Bali, Indonesia by Leurs (2010); the study of integrated medicine for advanced partnerships among traditional birth attendants and community midwives in Rancaekek, Indonesia by Ambaretnani (2012); and the study of interprofessional collaboration between traditional and modern medical practitioners in Tanzania by Chirangi (2013).

In Greece, research on patterns of health care utilisation behaviour has recently been conducted on the determinants of behavioural patterns and has identified the following independent factors as influential indicators: 'region'; 'gender'; 'country of birth'; 'country of parent's birth'; 'age'; 'education'; 'primary health insurance' and 'secondary health insurance', both referring to public and private schemes; 'income'; and 'self-rated health'. The dependent factors have been operationalised in a way to initially distinguish between forms of 'no utilisation' and 'any utilisation' and to subsequently assess patterns of health care utilisation behaviour by means of recording the number of people's visits to health care services or rates of hospitalisation. The operationalisation of the dependent factors has involved a differentiation between primary health care services, namely general practitioners and specialists, and secondary health care services referring to public and private hospitals.

Research conducted in Crete on patterns of diagnosis and health care utilisation shows that a number of emotional and rational factors influence the choice of medical treatment. The factors include: 'attitudes towards illness' and the 'burden placed on others in an event of illness'; the 'quality of care as experienced by the patient'; 'previous experiences with the respective medical system'; the 'feeling of trust in the medical practitioner'; 'fear of hospitalisation'; the 'desire to be modern'; 'health insurance'; 'cost'; 'socio-economic status of the patient'; the 'need for health care as experienced by the patient'; 'cause', 'type' and 'severity' of the reported illness; as well as 'distance' and 'accessibility' of the respective medical system (*cf.* Arnold 1986; Koutis *et al.* 1993; Hanepen 1997; Hagoort 1998; Clark 2002; Dijkstra 2005; Geitona *et al.* 2007; Trigoni *et al.* 2008; Alexopoulos & Geitona 2009).

In particular, research conducted in Crete indicated that the 'newness' of the treatment in terms of providers, equipment, technology and medicines, which generally includes an orientation towards urban areas, influences people's choice of medical treatment (*cf.* Arnold 1986). Research carried out in Spili on utilisation patterns of OTC medicines follows the approach to the study of utilisation by the three main categories of accessibility, introduced by Buschkens & Slikkerveer (1982), and identifies the following factors as main determinants of utilisation behaviour: (1) 'economic access' in terms of costs of transport, insurance and out-of-pocket payments; (2) 'geographic access', being distance and transportation; and (3) 'socio-cultural access', which refers to the relationship between the patient and the health care provider (*cf.* Hanepen 1997). Another study conducted in Crete on different patterns of consultation with local healers demonstrates that the patient's choice of treatment is largely dependent on the tradition, the family network, the social and educational level, the financial resources of the patient, the type of illness experienced by the patient and on the accessibility of the medical practitioner (*cf.* Clark 2011).

The recent joint research project on the assessment of Over-the-Counter Medicines in Primary Care in Southern Europe (OTC-SOCIOMED) focuses on the use of 'prescribed medicines' *versus* 'non-prescribed medicines' from the complementary perspective of not only consumers, such as clients and patients, but also of providers, such as physicians and pharmacists. The research, which has been carried out in five South-European countries, including Greece, Turkey, Malta, Cyprus and the Czech Republic, encompassed 932 patients and 855 clients as well as 585 physicians and 685 pharmacists. The utilisation model, as it had been applied to this study, shows *i.a.* that 932 patients from the sample reported the use of 2.459 medicines, differentiated over 819 non-prescribed (33.3%) and 1.640 (66.7%) prescribed medicines. Among the significant independent determinants of the utilisation of medicines in the five selected countries in this part of Europe are the variables: 'age'; 'marital status'; 'nationality'; 'education'; 'profession'; 'opinion on medicines'; 'preference for medicines'; 'socio-economic status of the patient', 'organisation of the health services', and 'perceived morbidity'. In addition, significant intervening determinants also included the factors 'regulations and promotions of medicines' as well as background characteristics of the physician.

In this international comparative study, Slikkerveer introduced an innovative model of the 'mutual relation analysis' indicating the mutual relationships among categories of significant determinants of patients of utilisation behaviour of prescribed and non-prescribed medicines (*cf.* Slikkerveer & Lionis 2012). This interesting model is also implemented in the present study of the utilisation of the plural medical system in Pírgos and Práitoria in Crete.

In view of the general applicability of the transcultural model of health care utilisation and the promising results of previous studies conducted on determinants of patterns of transcultural health care utilisation behaviour in different areas, the model has also been applied in the present research with a view to distinguish between the following blocks of factors: the independent predisposing factors composed of socio-demographic and psycho-social factors on the individual level; the independent enabling factors on the individual level; the independent perceived morbidity factors on the individual level; the independent institutional factors on the system level; the intervening factors on the system level; and the dependent factors, divided between the

utilisation of respectively the traditional, the transitional, and the modern medical system, on the system level (*cf.* Figure 3.2). The factors measured at the individual level, namely the socio-demographic, psycho-social, enabling and perceived morbidity factors, refer to person-specific concepts. The psycho-social and perceived morbidity factors both measure cognitive aspects, which relate to systems of knowledge, belief and opinion. While the psycho-social factors are measured on a rather general basis, the perceived morbidity factors assess people's knowledge, belief and opinion specifically in relation to their experience of illness. The factors measured at the system level, *i.e.* the institutional, intervening and health care utilisation factors, relate to official components of the plural medical system operating in the research area as well as to external phenomena.

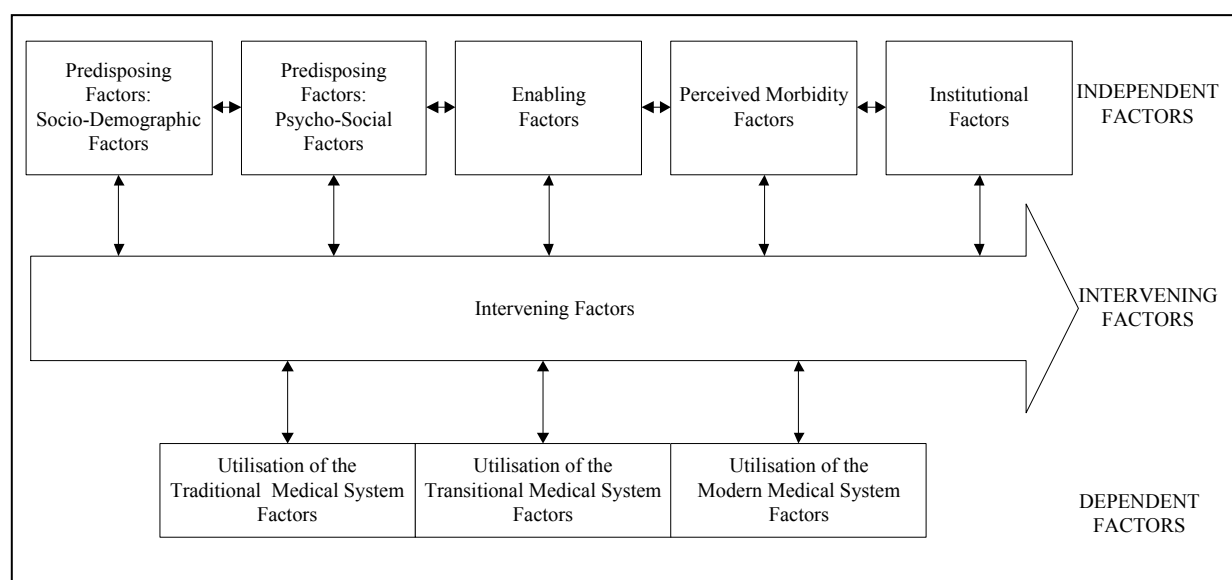


Figure 3.2 Conceptual Model of Transcultural Health Care Utilisation.
Source: Slikkerveer (1990); Slikkerveer & Lionis (2012).

3.1.3 Operationalisation of the Conceptual Model

The different blocks of factors indicated in the conceptual model of transcultural health care utilisation provide the basis for the analysis of patterns of transcultural health care utilisation behaviour. In order to operationalise the model into an adequate tool of measurement, the blocks of factors are sub-divided into measurable units, namely variables, which determine the subsequent selection of research techniques and statistical means of data analysis. In the model, the blocks of factors are at first specified as concepts, which are assigned on the basis of the intuition and experience of the researcher and are verified by measuring a number of variables related to each concept. On the basis of similar studies conducted elsewhere in the health sector and following qualitative research as well as a pilot study carried out prior to the execution of the household surveys in the two research communities, it has been possible to identify a number of potentially significant variables for each concept. The majority of concepts are commonly defined by a combination of variables which are concretised by a number of indicators respective to the complexity of each variable concerned (3.3). Since indicators generally vary between research areas, they are further substantiated by related categories, which are composed of a number of values, which ultimately allow for an adequate assessment of the phenomena or events desired to be measured (*cf.* Bice *et al.* 1976; Bernard 2002). Bice *et al.* (1976: 24) demonstrate that the process of measurement involves: '*specifying a concept, translating it into an operational definition which points to a variable that can be measured, and applying the operationally defined measurement technique to units of its indicators and related categories*'.

The matching of concepts, variables, indicators, categories and values as well as research questions can be subject to difficulties, which may arise when original and operationalised ideas are connected. Since empirical research generally involves some abstractions from the real world, rules of correspondence between concepts and indicators must be observed. Furthermore, indicators and real-world phenomena need to be linked by an adequate instrument of measurement. The questions formulated in the quantitative questionnaire, as they are selected on the basis of the nature of the selected variables, are applied at the level of categories. In other words, the categories of variables are incorporated in the questionnaire in the form of predefined answer categories and are later onwards used as categories of variables during the process of statistical analysis (*cf.* Bice *et al.* 1976; Leurs 2010). Tables 3.1 to 3.7 describe the detailed process of operationalisation of the concepts of the blocks of factors identified in the model of health care utilisation and applied to the research area of rural Crete, which encompasses the translation of blocks of factors into variables, indicators and categories.

Independent Predisposing Factors

Operating at the individual level, the predisposing factors refer to a number of socio-cultural background characteristics - a combination of 'hard' socio-demographic and 'soft' psycho-social factors - which influence people's health care utilisation behaviour (*cf.* Slikkerveer 1990). In particular, the following variables have been assigned to the concept of socio-demographic factors: 'community'; 'household size'; 'household composition'; 'gender'; 'age'; 'place of birth'; 'nationality'; 'religion'; 'education'; 'marital status'; and 'occupation' (3.4). Table 3.1 shows the operationalisation of the concept of the block of socio-demographic factors into variables, indicators and categories.

The following variables have been selected to define the concept of psycho-social factors: 'knowledge of the traditional medical system'; 'knowledge of the transitional medical system'; 'knowledge of the modern medical system'; 'opinion on the traditional medical system'; 'opinion on the transitional medical system'; and 'opinion on the modern medical system'. The variables of the knowledge and opinion of each individual have been concretised by means of incorporating a distinction between the traditional, transitional and modern medical system. In order to measure the respondents' level of indigenous knowledge of MAC plants in more detail, as this factor is forming a focal point in the present research, this specific knowledge is conceptualised in direct relation with the patients' knowledge of the traditional medical system, where it forms a major component, in the conceptual model. The assessment of the local people's indigenous knowledge of MAC plants is further substantiated in the indigenous classification of Medicinal, Aromatic and Cosmetic (MAC) plants, as well as the local priority plant species list for the research area, which have been constructed during the qualitative research in the area in fulfilment of the fourth specific objective of this study. Table 3.2 shows the operationalisation of the concept of the block of psycho-social factors into variables, indicators and categories.

Independent Enabling Factors

The following variables have been selected to define the concept of enabling factors, as they are also expected to influence the health care utilisation at the individual level: 'annual income'; 'annual expenses for health care'; 'insurance'; and 'socio-economic status'. The selected variables include the ability or respective inability of each individual to meet the financial requirements for receiving medical treatment, but exclude the costs paid by representatives of the medical system concerned. Although the financial requirements can in principle not be changed by the individual as they depend on the social and economic sub-system of the community, the variables operate on an individual level (*cf.* Slikkerveer 1990). Table 3.3 shows the operationalisation of the concept of the block of enabling factors into variables, indicators and categories.

Table 3.1 Independent Predisposing Factors: Socio-Demographic Factors.

Concept	Variable	Indicator	Category
Socio-demographic factors at the individual level	Community	Name of community	Pirgos; Praitoria
	Household size	Number of household members	1 member; 2 members; 3 members; 4 members, 5 and more members
	Household composition	Relationship of the household members to the household head	Household head; partner; son/daughter; grandchild; parent; brother/sister; parent-in-law
	Gender	Gender definition	Male; female
	Age	Number of years alive	<7; 7-13; 14-20; 21-27; 28-34; 35-41; 42-48; 49-55; 56-62; 63-69; 70-76; 77-83; 84-90; >90
	Place of Birth	Location of the place of birth	This community; this municipality somewhere else in Crete; somewhere else in Greece; other
	Nationality	Nationality	Greek; Albanian; Bulgarian; Rumanian other
	Religion	Religious affiliation	Greek Orthodox; Bulgarian Orthodox Rumanian Orthodox; non-Orthodox Christian; non-Christian
	Education	Level of education completed	No formal education; primary education; secondary education; post-secondary education
	Marital Status	Present marital status	Single; married/co-habiting; divorced/separated; widowed
	Occupation	Type of main occupation	Student/non-paid; homemaker; (stock) farmer; manufacturer; construction worker; retailer; provider of food, beverage, accommodation; insurance agent; head officer / researcher; servant to building; public administrator / defence personnel; educator; health, social worker; artis/entertainer; priest/ personal servant; employee of the private sector; unemployed/retired

Independent Perceived Morbidity Factors

Perceived morbidity has been identified as a major determinant of patterns of health care utilisation behaviour (*cf.* Kohn & White 1976; Slikkerveer 1990, Leurs 2010). The following variables have been selected to define the concept of perceived morbidity factors: ‘health status’; ‘reported illness’; ‘severity of the reported illness’; and ‘duration of the reported illness’.

Table 3.2 Independent Predisposing Factors: Psycho-Social Factors.

Concept	Variable	Indicator	Category
Psycho-social factors at the individual level	Knowledge of the traditional medical system	Level of knowledge of the traditional medical system	Little knowledge; average knowledge; much knowledge
	Knowledge of the transitional medical system	Level of knowledge of the transitional medical system	Little knowledge; average knowledge; much knowledge
	Knowledge of the modern medical system	Level of knowledge of the modern medical system	Little knowledge; average knowledge; much knowledge
	Opinion on the traditional medical system	Level of opinion on the traditional medical system	Negative opinion; neutral opinion; positive opinion; no opinion
	Opinion on the transitional medical system	Level of opinion on the transitional medical system	Negative opinion; neutral opinion; positive opinion; no opinion
	Opinion on the modern medical system	Level of opinion on the modern medical system	Negative opinion; neutral opinion; positive opinion; no opinion

Table 3.3 Independent Enabling Factors.

Concept	Variable	Indicator	Category
Enabling factors at the individual level	Annual income	Average amount of the household's annual income in Euro	<10.000; 10.000-20.000; 21.000-30.000; 31.000-40.000; >40.000; no income reported
	Annual expenses for health care	Average amount of the household's annual expenses for health care in Euro	<250; 250-500; 501-750; 751-1.000; >1.000; no expenses reported
	Insurance	Type of insurance coverage	IKA; OGA; OPAD; other; no insurance
	Socio-Economic Status (SES)	Level of SES	Poor; average; rich

In general, the perceived morbidity variables refer to the individual's subjective and culturally defined interpretation of health and illness, thereby following an indigenous illness classification, which is not necessarily similar to the objective medical standard classification (*cf.* Slikkerveer 1990). As Slikkerveer (1990: 220) notices: '*For the analytical purpose of the study - which is to obtain insight into illness behaviour without attempting to evaluate the medical services consulted by patients - the individual's interpretation and experience of his state of health are more important determinants of the related process of seeking and obtaining medical care than his state of health established by standardised, clinical criteria*'. The variable 'reported illness' refers to the main illness reported by the respondent as experienced during the 12 months preceding the interview of the household surveys. Based on the people's own assessment of time rather than determined on medical grounds, any illness reportedly lasting up to one month has

been defined as ‘acute’, while any illness lasting from 1 to 12 months has been distinguished as ‘chronic’ (*cf.* Slikkerveer 1990). Table 3.4 shows the operationalisation of the concept of the block of perceived morbidity factors into variables, indicators and categories.

Table 3.4 Independent Perceived Morbidity Factors.

Concept	Variable	Indicator	Category
Perceived	Health status	Level of health status	poor; average; well
Morbidity factors at the individual level	Reported disease	Classification of the reported illness	Local illness classification
	Severity of the reported illness	Level of severity of the reported illness	Not severe; mildly severe; moderately severe; highly severe
	Duration of the reported illness	Level of Duration of the reported illness	Acute; chronic

Table 3.5 Independent Institutional Factors.

Concept	Variable	Indicator	Category
Institutional factors at the system level	Accessibility of institutions of the traditional medical system	Perceived accessibility of institutions of the traditional medical system	Very difficult accessibility; difficult accessibility; average accessibility; easy accessibility; very easy accessibility; no institutions reported
	Accessibility of institutions of the transitional medical system	Perceived accessibility of institutions of the transitional medical system	Very difficult accessibility; difficult accessibility; average accessibility; easy accessibility; very easy accessibility; no institutions reported
	Accessibility of institutions of the modern medical system	Perceived accessibility of institutions of the the modern medical system	Very difficult accessibility; difficult accessibility; average accessibility; easy accessibility; very easy accessibility; no institutions reported

Independent Institutional Factors

In view of the recurring features of the components of the plural medical system operating in the research area, it has been possible to operationalise the concept of institutional factors by means of measuring the geographical accessibility of the plural medical system as perceived by the respondent. Although institutional differences exist between medical systems in terms of organisation, personnel or education, the present study focuses on the geographical accessibility of the plural medical system (*cf.* Slikkerveer 1990). The pilot survey conducted in the research area has shown the unequal dispersal of institutions of the plural medical system, thereby substantiating the choice of variables. As Lewis *et al.* (1976: 11) notice: ‘[Access] is measured by the availability of services in the community, the obtainability of services by any and all subgroups of the population, and the comprehensiveness of services offered by the source of first-contact care or facilities linked with it’. In this way, the following variables have been selected to define the concept of institutional factors: ‘accessibility of institutions of the traditional medical system’; ‘accessibility of institutions of the transitional medical system’; and

‘accessibility of institutions of the modern medical system’. Table 3.5 shows the operationalisation of the concept of the block of institutional factors into variables, indicators and categories. In an attempt to directly relate the institutional variables to the dependent variables of health care utilisation, the former have been substantiated on the basis of the distinction made between the traditional, the transitional and the modern medical system.

Intervening Factors

In general, intervening factors operating on the system level alter the standard relationship between independent and dependent blocks of factors from outside of the communities concerned. In view of the current economic situation of the research area as part of Crete, the following variable has been selected to define the concept of intervening factors: ‘impact of the current economic situation’. Table 3.6 shows the operationalisation of the concept of the block of intervening factors into variables, indicators and categories.

Table 3.6 Intervening Factors.

Concept	Variable	Indicator	Category
Intervening factors at the system level	Impact of the current economic situation	Perceived impact of the current economic situation on health care utilisation	Very low impact; low impact; average impact; high impact; very high impact; no impact reported

Health Care Utilisation Factors

The dependent variables operate on the system level and refer to the total number of contacts between the patient and the plural medical system, expressed in scores measuring attendance or utilisation rates (*cf.* Slikkerveer 1990). The following variables have been selected to define the concept of health care utilisation factors: ‘utilisation of the traditional medical system’, ‘utilisation of the transitional medical system’ and ‘utilisation of the modern medical system’, which together constitute of the overall concept of the utilisation of the plural medical system. The factors of ‘utilisation of the plural medical system’ measure the concept of health care utilisation in terms of reported contacts between respondents and the plural medical system operating in the research area during a recall period of 12 months preceding the household surveys. Table 3.7 shows the operationalisation of the concept of the block of intervening factors into variables, indicators and categories.

Table 3.7 Dependent Health Care Utilisation Factors.

Concept	Variable	Indicator	Category
Health Care utilisation factors at the system level	Utilisation of the traditional medical system	Contacts of individuals with the traditional medical system	Utilisation rates of the traditional medical system
	Utilisation of the transitional medical system	Contacts of individuals with the transitional medical system	Utilisation rates of the transitional medical system
	Utilisation of the modern medical system	Contacts of individuals with the modern medical system	Utilisation rates of the modern medical system

3.2 Research Methods and Techniques

3.2.1 Selection of the Research Area

Prior to identifying the appropriate measurement techniques for collecting information on the variables identified as possible determinants of people's transcultural health care utilisation behaviour in rural Crete, a suitable research area to conduct fieldwork has been selected during the pilot study. In view of the nature of the present research, which includes a detailed analysis of people's indigenous knowledge and practice of MAC plants available in the research area, preference has been given to a geographically remote, but an environmentally diverse area in which human-plant relationships have continued to form an integral aspect of community life. In general, a wealth of bio-cultural diversity coupled with a relative geographical isolation would render any population group living in a rural area a valuable resource for the study of the interactions between the community members and their natural environment (*cf.* Clark 2002). The most western province of Crete, Chania, in which the mountain range of the *Lefka Ori*, as well as numerous caves and gorges, including the famous Samaria Gorge, are found, has been taken into account for its geographical and natural diversity. Nevertheless, logistic reasons referring primarily to communication and transport networks, which had been established during previous fieldwork conducted in the area of Central Crete has directed the selection of the research area for the present study to the central prefectures of Crete, namely the Prefecture of Iraklion and the Prefecture of Rethymnon. Since the majority of previous fieldwork training of Master students from Leiden University on the subject of health and healing, and particularly on knowledge and use of MAC plant in Crete, had been carried out in the Prefecture of Rethymnon, the focus of the present study has eventually been focused on the less studied Prefecture of Iraklion. In order to meet the requirements of the 'Leiden Ethnosystems Approach' and the principle of the 'Participant's View', the selection of the research area has also been guided by a preference for small, rural communities in which influence from outside, particularly from mass-tourism and settlement, is limited and people continue to rely on their indigenous systems of knowledge, practice and belief. In an attempt to furthermore select a research area, in which the characteristics of each medical system are constant for all participants, particular attention has been paid to the local availability of health care services. Apart from the easy access to natural resources, the distance to health care facilities, such as pharmacies or rural health posts, has also been taken into consideration during the selection process of the research area.

In view of these considerations, the focus has eventually been drawn to the South-central part of the Prefecture of Iraklion, which appears to meet most selection criteria. The area of South-Central Crete is found at a considerable distance from urban areas of high population density and mass tourism activities (3.5). Furthermore, the region is topographically shaped by the extensive Mesara Plain, the largest and most fertile plain of Crete. Although the wider region of the Mesara Plain forms a suitable research site, the setting has subsequently been confined to the eastern part of the plain, as it is bordered by the Asterousia Mountains in the South and hereby provides a diverse geographical area, characterised by both lowland and mountainous areas. The immediate vicinity of the Asterousia Mountains to the Libyan Sea in the South moreover generates a diversity of natural habitats, which offer an abundance of plant species. The preference for the Mesara Plain is further determined by its distinct historical features, particularly in the form of human settlement patterns, which date back to the period of time of 4000 to 3300 B.C. The settlements of Phaestus and Ayia Triadha in the western part of the plain have evolved from the important centres of Minoan Crete, whereas the settlement of Gortyn in the centre of the Mesara Plain has formed the capital of the island under the Roman rule during the 1st century B.C.

Since the historical significance of the western region of the Mesara Plain, the settlements of Phaestus, Ayia Triadha and Gortyn, as well as the coast at the western edge of the lowland have become rather popular tourist destinations, the selection of a research area was eventually made

for the eastern, less touristic part of the plain. The attention has also been drawn to the Mesara Plain, where recently an interesting study of obesity rates has been conducted among the farmers living in the plain. This study has revealed that at the time of the research, the highest prevalence of obesity and overweight in this part of Greece has been recorded. Since the population of Crete has long been known for its healthy lifestyle and dieting, the results of the study has generated general attention and interest (*cf.* Vardavas *et al.* 2009; 2010).

Eventually, the secluded community of Praitoria in the eastern part of the Mesara Plain, which has presumably been inhabited since Roman times, has eventually been chosen as an appropriate research area. In view of the rather limited number of inhabitants living in Praitoria, an attempt has been made to extend the research focus and to include one or more mountain communities in the Asterousia Mountains. Although a number of these communities are located in the vicinity of Praitoria at higher altitudes, the seasonal inhabitation as well as the difficult accessibility of these mountain communities have favoured the choice of a more lowland settlement. By consequence, the neighbouring community of Pírgos has ultimately been chosen as a second research community, primarily because of its location in the lowlands at the foot of the Asterousia Mountains and its geographical and social vicinity to the other mountain settlements. In addition, its historical significance has also been a consideration as the community has similarly been inhabited since the Roman times. Moreover, Pírgos and Praitoria are both accessible by road, while the relative vicinity between the two communities rendered it possible to conduct the research in two communities over a rather limited period of time. In addition to the equal access to the diverse lowland and mountainous communities, the inhabitants of both communities furthermore cover a similar distance to the available health care facilities. Overall, the rural communities of Pírgos and Praitoria in South-Central Crete form an adequate research area to conduct the present study on transcultural patterns of health care utilisation behaviour (*cf.* Map 5.1).

3.2.2 Target and Sample Population

After the approval for conducting the present study had been received from the Ethical Committee of the University of Crete in Iraklion, strategies of sampling the target population have been assessed. In general, the ‘target’ or ‘parent population’ denotes the wider population living in the research communities of Pírgos and Praitoria. In view of the geographical vicinity of the two communities, the population of both villages has been combined into one target population group from which the sample has subsequently been drawn. In other words, the population of the community of Pírgos and the population of the community of Praitoria established together the sampling frame of the present study, namely the list of units from which the sample has been drawn and to which the results have eventually been generalised. Hereafter, the units of the target population, which have been chosen as the sample and in which the actual surveys have been conducted, are referred to as the ‘study’ or ‘sample population’.

In view of the identification of the sampling frame, this study aims at collecting information on individuals rather than on communities at large, from which the sample has been drawn by means of the implementation of combined non-probability and probability sampling techniques. Methods of non-probability sampling have been applied in the present research in the form of: (1) convenience or haphazard sampling, in which units are chosen on the basis of their ease of access; and (2) snowball sampling, in which units are sampled through the intermediary of the respondent referring the researcher to other, possibly interested, respondents. Since strategies of non-probability sampling provide a sound basis for the execution of exploratory research and for collecting cultural data, as these data are mostly provided by community experts, the approach has been followed during the stages of the pre-testing of the structured questionnaire and the gathering of in-depth, qualitative information (*cf.* Moser & Kalton 1971; Molenaar 1999; Bernard 2002; Van den Akker 2002). The snowball technique has been used during the pilot study in order to gain early access to the population and to gather detailed information on the

key-issues of the research. Initially, non-probability sampling strategies have largely been dominated by language proficiency, singling out sampling units with knowledge of English. After proficiency in the Greek language had been achieved, language was no longer a determining factor during the later stages of the data collection and large-scale household surveys (3.6).

In contrast to the non-probability sampling techniques, probability sampling assigns every member of the target population, namely the sampling frame, an equal chance of being selected as respondent. Since probability-sampling techniques are moreover designed to measure the attributes of individuals of a particular population group, they are also applied to the present study as an appropriate sampling technique for the quantitative household surveys. In this respect, a method of simple random sampling referring to a sampling technique, in which individual units are selected at random as opposed to follow a sampling interval, has been chosen for the present study (*cf.* Moser & Kalton 1971; Bernard 2002). While it is the initial aim of the quantitative household surveys to cover about 400 units from the wider sampling frame, the number of elements is reduced to 300 units because of the feasibility in the field. Sampling is disproportionate as it aims at covering the entire population of Praitoria and at completing a maximum of 300 units with units drawn from the population of Pirgos. Compared to the size of Pirgos, the population of Praitoria is relatively small, *i.e.* covering one-fifth of the population of Pirgos. Apart from certain research advantages related to cover a smaller population size for easier management and faster as well as better establishment of local networks, the aim of covering all units in Praitoria is primarily based on prior acquaintance and increased interest in the community.

3.2.3 Development of Research Instruments

In addition to the identification of methods of sampling, certain appropriate research instruments have been designed in order to collect information on people's health care utilisation behaviour in general, and on the related variables, which have been identified as determinants of people's behaviour in particular. The term 'research instrument' is used to refer to any type of research method, such as qualitative questions and a quantitative questionnaire, which are used during the surveys. Research instruments are constructed on the basis of anonymity and confidentiality, thereby excluding questions on the name or contact information of the respondent. In an attempt to gain early access to the village population and to collect in-depth data on local patterns of health care utilisation, a number of open-ended, qualitative questions have been formulated and subsequently translated into the Greek language. The qualitative questions are designed in an attempt to identify and explore particular key-issues, such as the knowledge and use of traditional and herbal medicine and the indigenous classifications of MAC plants and illnesses, as these qualitative data provide insight into the local circumstances and the knowledge and experience of the local inhabitants. As Moser & Kalton 1971: 341) observe: *'In an open ended question the respondent is given freedom to decide the aspect, form, detail and length of his answer, and it's the interviewer's job to record as much of it as she can'*. On the whole, this method of analysis has particularly shown to be useful during the pilot study prior to the execution of the quantitative surveys, especially since the open-ended questions were used to clarify and specify certain key-concepts, which could subsequently be dealt with during the quantitative household surveys. The open-ended questions were asked at all stages of the research process, particularly in the form of additional questions, which are added to in the structured questionnaire. Also, after the completion the household surveys, sometimes further in-depth questions were posed to the respondents in order to collect supplementary information on particular key-subjects (*cf.* Bernard 2002).

In addition to the formulation of open-ended questions for interviews with key-informants, the construction of the structured questionnaire as the basis for the quantitative household surveys, proved to be rather challenging. Designed to measure the variables identified as possible

determinants of people's health care utilisation behaviour, a number of closed-category questions, *i.e.* questions with pre-defined answer categories, have further been elaborated. The order of questions in the questionnaire is arranged on the basis of general standards, which include the combination of similar questions and the location of sensitive questions at the centre of the questionnaire. In the same fashion, some answer categories were arranged accordingly and reformulated as 'don't know' or 'no answer provided', and if feasible, 'not applicable'. The pre-defined answer categories also included 'other' as an option for a possible answer, followed by an empty line to enable the interviewer to record any 'other' answer, which is not included in the pre-defined answer categories. The structured questionnaire has gradually been adapted on the basis of the information, which was collected during the open-ended questions of the in-depth interviews in the pilot survey. In absence of a comparable questionnaire in the Greek language, the questions and answer categories have been translated one by one from English into Greek with the help of a professional linguist who is proficient in both languages. In this respect, a recent study carried out on the prevalence of Dyspepsia among a Greek population group underscores the importance of the development of a standardised questionnaire for conducting medical research in Greece in the Greek language (*cf.* Anastasiou *et al.* 2006). The same challenges are met in similar studies in medical anthropology, sociology and ethnomedicine, carried out in other culture areas of the world.

Subsequently, the questionnaire has been pre-tested during the pilot study with key-informants from both research communities, after which the outline of the initial questionnaire had to be slightly modified in order to meet the local requirements. Following the pre-testing as well as the translation and re-translation of the structured questionnaire during the pilot study, it has eventually been possible to develop a questionnaire with adequate vocabulary, precise questions and clear answer categories (*cf.* Slikkerveer 1990; Bernard 2002; Van den Akker 2002; Galobardes & Demarest 2003; Sapountzi-Krepia *et al.* 2005; Alexopoulos & Geitona 2009). The construction of the quantitative questionnaire is also based on the results of previous studies on research methods and techniques in the medical social sciences, including Suchman (1965); Kohn & White (1976); Astin (1998); Mosca *et al.* (2000); Pongsupap & Van Lergerghe (2006); Wilson *et al.* (2007); Kersten *et al.* (2009); Leurs (2010) and Slikkerveer & Lionis (2011).

The final version of the structured questionnaire follows the sequence of the various blocks of variables in the conceptual model, encompassing the blocks of respectively the socio-demographic variables, the psycho-social variables, the enabling variables, the perceived morbidity variables, the institutional variables, the intervening variables and eventually, the dependent health care utilisation variables, completed with some additional general questions on certain key-issues on the subject. The implementation of the structured questionnaire has also taken into account its application as a valid, precise and accurate means to conduct quantitative research on patterns of health care utilisation in rural Crete. The trustworthiness of the research instruments designed for this study, which include a number of open-ended, qualitative questions as well as an elaborate quantitative questionnaire, is directly linked to the validity of the collected data thereupon by means of these applications (*cf.* Bernard 2002).

3.3 Data Collection and Analysis

3.3.1 Qualitative Data Collection: Key-Informants

In order to gain access to the local population, to draw an adequate sample and to subsequently apply the quantitative questions in the structured questionnaire, initial techniques of data collection, implemented particularly during the pilot study, have required a general introduction of the nature of the research for the benefit of the respondent. Letters of introduction have been prepared and translated accordingly in a way to provide a short description of the research, as well as information on the academic affiliations and funding agencies involved in the study. In the same fashion, qualitative research in terms of asking open-ended questions to key-informants

conducted during the pilot survey also involved the a brief written statement in the Greek language, which was handed out in printed form to any respondent willing to answer the questions. This approach proved particularly valuable for overcoming the initial language difficulties. The statement explained the nature of the present research, assured anonymity, informed each respondent about the right to refuse answering any of the formulated questions and offered information on how to contact the researcher for questions or concerns (*cf.* Bernard 2002). In addition to a formal introduction, initial acquaintance with the participants and respondents has been made in the form of reviving existing personal contacts and following random conversations with community members, as well as by visiting the two research communities and participating in local events (*cf.* Hahn & Inhorn 2009) (3.7). In this way, the physical and social layout of the community is studied, enabling the drawing of maps of the local settlement patterns and charts of the relationships between the community members. Rapport with certain key-people, who occupy rather prestigious positions in the communities, such as the local priest or the head of the local primary school, were established in order to strengthen the local network. Personal experience and interaction with the village population also resulted in a gradual acquisition of the necessary social skills, such as learning the local language for better understanding and communication. In general, the technique of participant observation forms a very useful qualitative method of research, upon which data are collected on the basis of the immersion of the researcher into and regular removal from the research community, whereby the researcher is able to share the aim and objectives of the study with the members of the communities concerned. Participant observation also renders it possible to collect information on local systems of knowledge, practice and belief not only by observing and asking questions, but also by participating in local events, ceremonies, meetings and festivities. Furthermore, this technique provides a sound basis for conducting extensive household surveys, asking sensitive questions and making strong statements about the information collected at a later stage (*cf.* Blum & Blum 1965; Arnold 1986; Bernard 2002; Hahn & Inhorn 2009).

In addition to participant observation, initial information is gathered by means of applying a number of qualitative research methods, which are designed to collect in-depth information on certain key-issues. The collection of qualitative data commonly takes the form of unstructured interviewing, which is based on open-ended questions asked without any restrictions of time or control. Similarly, semi-structured interviewing, which also involves open-ended questions, often follows a general script in order to collect comparable data (*cf.* Blum & Blum 1965; Bernard 2002). While the method of semi-structured interviewing proved particularly valuable during the pilot study, the method of spontaneous, unstructured interviewing have been employed at any stage during the research process and have commonly involved a discussion led by the respondent on certain key-topics determined by the researcher. During certain stages of the quantitative household surveys, qualitative methods of data collection have been applied in order to gather additional relevant information. For instance, qualitative information has been collected when people's answers on questions were recorded, which relate to the block of psycho-social factors, resulting in a combination of structured and semi-structured interviews conducted during the household surveys. In this way, a number of respondents, who demonstrated considerable knowledge on central topics, have been identified as key-informants and have been questioned repeatedly as the study progressed through techniques of unstructured and semi-structured interviewing. Key-informants have been consulted in an attempt to construct an indigenous classification of MAC and a related indigenous classification of illnesses. The qualitative research technique of conducting additional interviews, which has been applied during or after the stage of the quantitative household surveys, has been implemented in the local language (*cf.* Blum & Blum 1965; Alcorn 1995; Bernard 2002).

In case that the respondent agreed, methods of note taking, at times in a language other than the one spoken, accompanied the collection of qualitative data during all stages of the research process. Notes have been made in the form of: scratch notes taken on the spot on minor observations; field notes made during the stages of interviewing; a personal diary, in which every

day events and emotions have been written; and a running account, in which information on the expenses of time and money has been kept (*cf.* Bernard 2002). In addition to taking research notes, the qualitative information collected has been - if possible - necessary and permitted by the respondent, verified by audio-recordings, photographs, pamphlets or samples of plants, which eventually increased the reliability of the data gathered. Qualitative interviews held during the pilot study and at later stages during the research process have been generally recorded with an electronic device, not at least in an attempt to overcome language difficulties and to document particular wordings. Furthermore, data gathered on the names and shapes of locally used MAC plants have been at times supported by photographs taken or plant samples collected (*cf.* Vokou *et al.* 1993).

3.3.2 Quantitative Data Collection: Household Surveys

In addition to employing techniques of participant observation and qualitative data collection, two extensive surveys have been undertaken within the present research in order to gain sufficient insight into people's health care utilisation behaviour. Data have been collected quantitatively on the basis of two quantitative household surveys, which form an appropriate means to collect data on the demographic, social, attitudinal, economic and morbidity characteristics of the research community (*cf.* White *et al.* 1976). The household surveys have moreover been identified as an adequate strategy for identifying limitations within the official health care system (*cf.* Buschkens & Slikkerveer 1982). As Slikkerveer (1990: 30) confirms: *'In particular, the population survey, an important issue in this type of research, not only deepens the understanding of patterns of utilisation of different kinds of health services by a population, but relating health care utilisation to cases of illness reveals the volume of unmet needs, identifying illness or disability for which only self-medicine or no specific care has been sought [...]'*.

The household surveys have been conducted in the form of personal interviews held at the homes of respondents between the researcher and the household head. The household head has been identified as the person in the household most knowledgeable about health- and illness-related topics and about the household's financial status, as well as someone capable of providing socio-demographic information on all other household members. On the other hand, the 'household member' has been defined as any person, who usually stays, sleeps and shares meals or spends more than six months a year living in the household (*cf.* WHO 2002b). Prior to commencing the interview, the household members present at the time of the researcher's visit have been herewith asked to identify the household head among themselves. In case that the household head has been selected from the members present, the interview began, whereby questions have been asked to the household head. In case that the household head has been identified but absent at the time of the researcher's visit, the interview has been rescheduled for a time or day the household head has been present. The identification of the household head has been moreover obsolete among single-member households. Having selected the household head, the interview proceeded in a face-to-face manner with the interviewer recording the respondent's answer and taking additional notes on the printed questionnaire. Overall, the answers, which have been provided by the household head, have been distinguished as characteristic for the entire household and have been subsequently assigned to each household member. During the interview process, however, the other household members commonly stayed to observe, to provide additional qualitative information or to assist the household head in answering the questions, particularly regarding the blocks of socio-demographic, perceived morbidity and health care utilisation factors. In general, all respondents have been exposed to the same type of questionnaire, thereby generating quantitative, comparable data. At later stages during the household surveys, it has been moreover possible to use the information already collected in order to probe questions and to test the quality of the information gathered by the researcher (*cf.* Bernard 2002).

The general information on the front page of the formal questionnaire referring to the date and place of the interview, as well as to the name of the community and the number of the respondent selected has been provided by the researcher. Hereafter, respondents have been asked to share their knowledge of the variables related to the blocks of psycho-social, institutional, intervening and enabling factors. Subsequently, the focus of the interview widened, as the respondent has been requested to provide socio-demographic information on each of the household members, including the household head. In the same fashion, the respondent has successively been asked to give information on the perceived morbidity of each household member, including the household head, whereupon data gathered on the respondents could be divided between subjects who had experienced an episode of illness during the recall period of the preceding 12 months, hereafter identified as 'patients', and subjects who not had experienced an episode of illness during the recall period, hereafter referred to as 'non-patients'. While the interviews at this stage were completed for the category of 'non-patients', the interview with 'patients' continued with asking the questions concerning the dependent variables of health care utilisation of the three available medical systems. In this way, detailed information was collected on the type of medical treatment sought by each patient, the costs concerned and the result of the treatment. The interview was also completed at this stage if 'patients', who had experienced an illness episode during the recall period but who had not sought any type of medical treatment, rendering them also to belong to the category of 'non-patients'. In general, the quantitative data have been collected at the lowest level of analysis, *i.e.* at the individual level, allowing for a recalculation of data into larger units at a later stage of the process of data analysis.

3.3.3 Data Analysis

In order to present the information collected by means of qualitative interviews and quantitative questionnaires in the form of an overall statistical profile of patterns of transcultural health care utilisation behaviour, a thorough data analysis has been performed. Qualitative data have been studied on the basis of text interpretation in order to understand the meanings and interconnections among the cultural expressions used by the community members (*cf.* Bernard 2002). Data, which were collected on the indigenous classifications of MAC plants and on illnesses, for example, have been analysed schematically and graphically, thereby showing how people organise their knowledge. Audio-recordings have been transcribed and translated, pamphlets have been translated and samples of plants have been dried and compressed using books and papers.

The extensive amount of comparable, quantitative data, which has been collected by means of the formal questionnaire in correspondence with the conceptual model, has been evaluated through methods of statistical data analysis. Following the preparation of the data set - a process specifically explained in Paragraph 8.1.1 - a number of statistical techniques have been applied to the collected data in order to closely analyse patterns of transcultural health care utilisation behaviour and to substantiate qualitative findings. In general, the statistical analysis offers a variety of programmes, which can be used to find certain effects, processes and interactions involved in patterns of health care utilisation behaviour reported by the study population and to ultimately predict people's utilisation behaviour on the basis of the multivariate model applied to the collected data. Statistical methods have been chosen in accordance with the type of variables, which are included in the respective categories of factors, represented as blocks in the model, with the objective to evaluate the relationships and interactions between and among the variables as well as between the blocks of variables. In other words, techniques of statistical analysis have been selected with a view to document, understand and explain the interaction between the independent variables and the intervening variables in relation to the dependent variables of health care utilisation in the multivariate model, and to ultimately provide a statistically sound indication of the significant variables as determinants of the people's health care utilisation behaviour.

In the effort to divide the sample population into household members and then to sub-divide into 'patients' and 'non-patients', the quantitative data, which are collected during the household surveys, have first been transformed into two different data sets: (1) all household members including 'patients' and 'non-patients' (N=656); and (2) health care utilisation rates of all household members identified as 'patients' (N=452). In this respect, the number of households visited during the surveys amounts to 293, whereby the original target of a total of 300 units had to be reduced after the initial process of data cleaning. The two data sets offer information on all blocks of variables identified within the multivariate model for each household member of the sample. Data set *one* will be further described in Chapters V, VI and VII, whereby the data sets are subject to univariate analysis, namely a descriptive analysis of one variable at the time, and are used to substantiate the qualitative findings. In addition, data set *two*, which is described in Chapter VIII, provides the basis for the stepwise analyses, *i.e.* the bivariate analysis, the mutual relations analysis, the multivariate analysis, and the multiple regression analysis performed on the collected data. In this respect, all these analyses applied to the data sets are carried out with the use of Version 20 of the IBM Statistical Package for the Social Sciences (SPSS).

The bivariate analysis forms the point of embarkation for all statistical methods applied on the collected data in a way that it analyses the strength, direction and shape of the relationships between two variables. Assessing the quality of the relationship between a pair of variables, the bivariate analysis highlights to which extent the relationship between two variables exists by chance alone, or indicates a statistically relevant covariation. In other words, the bivariate analysis indicates *if* and *how* changes in one variable are met with similar changes in the other variable, and whether these changes occur because of a statistically significant relationship between the variables (*cf.* Bernard 2002; Field 2009; Leurs 2010). In the context of the present study, the bivariate analysis shows to what extent the score of the dependent variables can be predicted from any of the independent or intervening variables in the model. The bivariate analysis, however, does not allow for any indication of causality, *i.e.* for explaining which variable actually results in change, not at least because of the fact that any relationship between two variables can - or will - always be affected by other measured or unmeasured variables (*cf.* Field 2009).

Based on the type of data collected from the quantitative household surveys, the method of the bivariate analysis is selected in order to analyse the relationship between categorical variables with more than two categories, and to perform an analysis of the related frequencies. Firstly, the technique of cross-tabulation is implemented, in which two variables have been arranged in a grid, whereby the frequencies of each category are noted in the cells of the tabulation. In this way, it becomes possible to make a detailed comparison between both variables. While the schematic presentation of data in the table allows for an initial interpretation of frequencies and percentages across the cells, the Pearson's chi-square test (χ^2) is used to evaluate the actual relationship between the two variables. The Pearson's chi-square test of independence of two categorical variables determines whether the two variables within a cross-tabulation are associated and whether such association occurs by chance, or indicates an actual phenomenon within the population at large. In other words, the greater the significance value of the Pearson chi-square statistic, which is marked with χ^2 , the less likely it is that the association between two variables exists by chance (*cf.* Bernard 2002; Field 2009; Leurs 2010).

In this way, the Pearson's chi-square test is based on two assumptions: (1) each respondent contributes to only one category in the cross-tabulation; and (2) no more than 20% of the expected frequencies are below 5 and none of the expected frequencies are below 1 (*cf.* Field 2009, Leurs 2010). In an effort to comply with the assumptions of the chi-square test statistic, all data included in the cross-tabulation are independent, as each respondent contributes to only one cell within the grid. Furthermore, the majority of expected frequencies, albeit not presented, are either all above 1 or, provided the number of frequencies remained below 20%, above 5.

Nevertheless, in a few cases the variables fail to meet the second assumption, as data are heavily tied or unbalanced, causing the sample distribution of the test statistic to be too deviant from the approximate chi-square distribution. Consequently, the probability of the chi-square test failing to determine a statistically significant relation between variables increases considerably. In order to overcome the loss of statistical power, an exact test is applied to the cross-tabulations, which fail to fulfil the second assumption, thereby solving the problem of approximation in small, unbalanced tables (*cf.* Field 2009).

Apart from adding the option of exact tests to the present data set, the values of significance of the chi-square test results are adapted to a certain extent. In general, significance values assess the degree of probability, to which a correlation between variables occurs by chance and are usually displayed as probability (p) values. In modern statistics, a probability value of .05, which equals a confidence interval of 95% and implies a .05 probability that the relationship between variables occurs by change, commonly forms the basis of significance tests (*cf.* Field 2009). Nevertheless, a number of studies have refined the mere dichotomy of defining values above .05 as 'non-significant' and values below .05 as 'significant' into a more nuanced classification of significance. In general, p-values above the threshold of .05 may indicate a certain trend among data, while values below the criterion may differ in terms of being significant. In order to avoid an oversimplification of results, the significance values of the Pearson's chi-square test are arranged along the following scale: $\chi^2 > .15$ 'non-significant'; $\chi^2 = .15-.10$ 'indication of significance'; $\chi^2 = .10-.05$ 'weakly significant'; $\chi^2 = .05-.01$ 'strongly significant'; $\chi^2 = .01-.001$ 'very strongly significant'; $\chi^2 < .001$ 'most strongly significant' (*cf.* Agung 2005; Leurs 2010; Djen Amar 2010; Ambaretnani 2012; Chirangi 2013).

In order to further analyse the strength of each statistically significant association between two variables, Cramer's V can be applied to the data in order to measure the strength of all significant relationships regardless of the number of categories of each variable in the cross-tabulation. The values of Cramer's V range from 0 to 1, whereby 0 implies that no relationship exists between variables and 1 indicates that variables are perfectly associated (*cf.* Leurs 2010, Field 2009). In an attempt to adequately explain and interpret the effects between variables identified through a bivariate analysis, conclusions can be drawn from the percentage values presented within each cross-tabulation. Significant associations can basically derive from proportionally small differences in cell frequencies whereupon percentages rather than frequencies form an appropriate means to detect patterns within the data (*cf.* Field 2009). The bivariate tables indicating the distribution of two selected variables are interpreted on the basis of percentage values.

Subsequently, the mutual relations analysis is performed in which all statistically significant associations between variables are indicated in the block of variables in the multivariate model of transcultural health care utilisation. In view of the processes involved in the bivariate and mutual relations analysis, the statistical procedures involved and the results gained from the main component of the statistical data analysis applied to this study provide a sound basis for further consultation and interpretation of the results obtained from subsequent multivariate data analyses.

Although a bivariate analysis offers a significant insight into the relationship between independent, intervening and dependent variables, it fails to take into account the mutual and simultaneous interactions between all variables included in the multivariate model. Multivariate statistics form an extension of univariate and bivariate methods of data analysis by offering techniques to analyse more complicated data sets, in which variables are correlated to varying degrees. The multivariate statistic applied to the present study refers to the nonlinear canonical correlation analysis, using the technique of OVERALS which has been developed at the Department of Data Theory of the Faculty of Social Sciences of Leiden University (*cf.* Gifi 1990).

In particular, classical canonical correlation analysis assesses the relationship between two sets of variables, frequently referred to as independent and dependent variables, in which both sets contain multiple variables. As Gifi (1990: 193) elaborates: *‘Any variable may contribute to the analysis in as much as it provides independent information with respect to the other variables within its own set and to the extent that it is linearly dependent upon other variables in the other set’*. In order to study the relationship between sets of variables, each set is first combined into a predicted value, namely an underlying dimension within the set also referred to as underlying factors or linear components, in which variables cluster together in a meaningful way. Clearly, the number of variables within each set produces a specific number of possible combinations, namely dimensions, whereupon the researcher determines the number of dimensions necessary for analysis.

Multivariate analysis generally produces reliable results on the first two dimensions, whereby the strongest combinations are found on the first dimension. In this way, canonical correlation analysis links up with the techniques of factor analysis and principal component analysis in the sense that it produces, across all subjects, the highest correlations between the predicted value and each selected variable, whereby an estimation is made to which extent the variable contributes to the underlying set of variables. The coefficients, which result from the correlations between the predicted values and the single variables, are known as ‘factors’ or ‘component loadings’. On the whole, this analysis aims at identifying items, which load high on the respective factor or component (*cf.* Tabachnick & Fidell 2001; Bernard 2002; Field 2009).

In classical multivariate analysis, variables are usually assumed to have an a priori quantification and have to be treated at the interval level of measurement whereupon the transformation graph takes the shape of a straight line. The multivariate technique applied to this study, however, allows for the inclusion of variables, which have been measured at the nominal or ordinal level, whereby transformation graphs are produced in a shape other than straight lines (*cf.* Van de Geer 1993b). The OVERALS method describes a canonical correlation analysis, which is nonlinear and which assigns nonlinear transformations to the respective variables in order to be able to maximize correlation. In general, OVERALS forms an appropriate method of multivariate data analysis for the present study, particularly since a number of comparable studies have applied this method successfully. In these studies, research has also been conducted on patterns of behaviour by means of examining the relationship between variables, which are identified in an overall multivariate model (*cf.* Agung 2005; Ibui 2007; Djen Amar 2010; Leurs 2010; Ambaretnani 2012; Chirangi 2013).

Apart from serving as the main method of multivariate analysis, the OVERALS technique is also implemented during the last stage of the statistical analysis performed on the collected data, during which an explanatory model of health care utilisation is developed, which allows for an ultimate prediction of people’s utilisation behaviour. The analysis is no longer focussed on the relationship between variables, but on the correlation between the different blocks of variables, which have been identified within the multivariate model. First, the OVERALS analysis is performed on each block of variables in order to evaluate the correlation between two blocks of variables in the model. Subsequently, the eigenvalues retrieved from each correlation are inserted into a formula, which produces the multiple correlation coefficients (p) indicating the strength of the relationship between the blocks of variables (*cf.* Field 2009; Leurs 2010). Since a multiple regression analysis provides a rather useful technique for the study of the relationship between blocks of independent and dependent variables, the amount of variation in the block of dependent variables, which is accounted for by the model, can be estimated. The description of the process of the stepwise statistical analysis concludes with a presentation in the ultimate model of the values of the multiple correlation coefficients, which highlight the characteristics of the processes related to the patterns of transcultural health care utilisation behaviour of the population of rural Crete.

Notes

- (3.1) The system level of health care utilisation behaviour refers to be concept of medical systems and needs to be distinguished from the notion of health care systems, which relates to institutions offering medical services.
- (3.2) According to a recent study conducted among the Mediterranean islands, people with a lower SES are more likely to adopt unhealthy patterns of behaviour, such as smoking and unhealthy dieting patterns, and to have a worsened psychological profile, namely to show depressive symptoms. By consequence, individuals tend to develop risk factors for cardiovascular diseases, such as hypertension, hypercholesterolemia and obesity as well as a high body mass index, more frequently than people with a higher SES, who appear to have a greater adherence to the Mediterranean Diet (*cf.* Panagiotakos *et al.* 2008).
- (3.3) Since concepts are commonly defined by more than one variable, any statistical measurement process eventually applied requires a testing of correlations between the different variables assigned to each concept (*cf.* Bice *et al.* 1976; Leurs 2010).
- (3.4) The grouping and lineup of categories of the variable ‘Occupation’ follow the order applied in the ‘International Standard Industrial Classification of All Economic Activities (ISIC), Rev. 4’, which has been developed by the Statistics Division of the United Nations (UN) (*cf.* United Nations 2013).
- (3.5) In this respect, an initial research strategy included a comparison between the area of South-Central Crete and the tourist town of Malia at the north coast in the Prefecture of Iraklion. Nevertheless, these initial considerations have been abandoned following limitations of time and feasibility.
- (3.6) In order to acquire proficiency in Greek, the researcher followed a one-semester beginners course in Modern Greek in 2009 at the ‘Bibliotheek plus Centrum voor Kunst en Cultuur (BplusC)’ in Leiden, The Netherlands, and took intensive private lessons in Modern Greek for a period of approximately three months in 2011.
- (3.7) The Easter celebrations held right at the beginning of the fieldwork stage rendered it possible to assist in a number of community gatherings and festivities and to become acquainted with the target population in a rather short period of time.