# Ubar Kampung: indigenous knowledge and practice of medicinal, aromatic and cosmetic (MAC) plants used for the treatment of diabetes mellitus in the Tatar Sunda Region of West Java, Indonesia

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# Chapter IX CONCLUSIONS AND RESEARCH IMPLICATIONS

This final chapter presents the conclusions and implications of the study on the utilisation of the plural medical system and the contribution of indigenous knowledge and practices on Medicinal, Aromatic, and Cosmetic (MAC) Plants for the treatment of diabetes mellitus in Indonesia. It includes a description and explanation of the significant factors influencing patterns of utilisation of traditional, transitional, and modern medical systems by the Sundanese community in five research villages.

## 9.1 Conclusions

The general aim of this study is to document, study and analyse indigenous peoples' knowledge and use of MAC plants for the treatment of diabetes mellitus in the five sample villages in Kabupaten Bandung, West Java as part of their overall utilisation of the plural medical system for health improvement and the development of new plant-based medicines in Indonesia. The present study seeks to answer the following general research question: '*What kind of people with what kind of knowledge of MAC plants use what kind of medicine for diabetes mellitus?*' The study encompasses the identification, documentation, and analysis of the related patterns of utilisation behaviour over the traditional, transitional and modern medical system at the community level.

The concept of Indigenous Knowledge Systems (IKS) has been applied in the present study as a way to adopt a community perspective and to collect information on the local knowledge-belief-practice complex. The concept of IKS forms an approach which is most appropriate for the study of local behavioural patterns and for gaining a better understanding of local people's concepts of health and illness.

In order to substantiate the theoretical orientation of this study, an overview of the relevant theoretical foundations of current research on the treatment of diabetes mellitus, health utilisation behaviour, indigenous medical knowledge systems, and developments on medical pluralism in developing countries are presented in Chapter 2. Following these current developments, the main approach in this study, the Leiden Ethnosystems' Approach, is introduced in Section 3.1.1. This approach places the *emic* point of view in the study of health care utilisation, focusing on the knowledge-belief-practice complex of the health and healing practices in the Sundanese community.

On the basis of the implementation, the main research methodology, data collection and analysis using complementary qualitative and quantitative research techniques were carried out to achieve the seven specific objectives of this study. By conducting an extensive household surveys in five villages in Kabupaten Bandung, data were collected for a total of 358 cases to analyse local patterns of transcultural health care utilisation behaviour.

In general, the population in Kabupaten Bandung seeks treatment from various sources, which in the context of the medical system, consists of the traditional, transitional, and modern medical system; therefore, it adopts the patterns of transcultural health care utilisation. The different medical systems in the research area are identified based on the information provided by local inhabitants. Furthermore, the present study also documents the local people's knowledge and utilisation of locally available MAC plants as a component of the traditional medical system in the Sundanese community. Local people demonstrate extensive knowledge in the collection and preparation of plants for medical purposes. In addition to the general aim of the study, this research has achieved the following specific objectives, as outlined in the following paragraphs.

*Firstly*, the National Health care System in Indonesia with particular attention to the management of non-communicable diseases (NCDs) has been presented in Chapter IV, while the description of health services delivery in Kabupaten Bandung as the research area is presented in Chapter V. Indonesia is currently experiencing a demographic and epidemiological transition. The health care system in Indonesia is the result of transformation and reformation over several decades. Western medicine, or conventional medicine, represents the predominant medical system in the country. The introduction of western medicine started during the colonial period when the Dutch East India Company established the first hospital in Batavia. Following this, after independence, western medicine became the 'official' medical system in Indonesia after the government nationalised several private hospitals in the country.

In 1997, amidst the consequences of the Asian financial crisis, the political system in Indonesia as well as the health care system transformed from a centralised to a decentralised system. Following this, in 2004 the government initiated a comprehensive social security framework, including a plan for national health care insurance. This was realised in 2014, namely Jaminan Kesehatan Nasional (JKN) which is managed by Badan Penyelenggara Jaminan Sosial (BPJS). The implementation of National Health care Insurance presents a major reform in the health care system in Indonesia, after decentralisation.

In response to the increasing burden of NCDs, including diabetes mellitus, the Ministry of Health established a Directorate of Non-communicable Diseases to manage the prevention of NCDs in the nation. The programs are divided into provincial and municipality levels. At the municipality level, the NCDs prevention program is provided by *puskesmas* with assistance from a community-based coaching post, namely *posbindu*. At the village level, *posbindu* monitors people at risk of NCDs and enables the community to participate in early detection of NCDs.

Continuing, Chapter IV highlights the health care system in the country, and health care services provided in Kabupaten Bandung are further discussed in Chapter V. Health care services in Kabupaten are composed of three different co-existing and interacting medical systems, namely the traditional, transitional, and modern medical system. In Kabupaten Bandung, modern health care services are provided by the public and private sector. Overall, at the district level, there are at least four public hospitals and two private hospitals which offer complete health care services. In the primary health care service, there are sixty-two *puskesmas* in Bandung Regency spread over thirty-one districts. However, compared to the population of Kabupaten Bandung, the number of *puskesmas* is still inadequate and the services aren't supported by sufficient health care personnel.

The transitional health sector is represented by self-medication practices and health services administered by *mantri*, midwives, and pharmaceutical technical staff. They occupy an intermediate position between the traditional and modern health sector. As care services are getting more and more expensive, and are sometimes not even available, most people tend to choose simpler and cheaper treatments available in the community before visiting formal health centers. Pharmacies are more attractive for community members because the facilities are usually near to their homes, the consultation is free, and the medicine can be purchased in the desired amount.

However, despite the ease of their accessibility, the practice of self-medication also renders negative consequences. Self-medication has frequently been accompanied by improper application such as the use of leftover medicine from previous illness, the exchange of medicine between family members, the use of medicine which has been prescribed for someone else with similar symptoms, the intake of medicine with coffee, tea, and milk, and discontinuation of medicine once symptoms have disappeared.

Furthermore, in the research area, the *mantri* is also preferred by community members, because the *mantri* charge less money than doctors and provide potent medication. Usually,

the *mantri* distributes '*pil stelan*' claimed as a 'cure-all' medicine, which in fact is a combination of sodium diclofenac and dexamethasone. This combination is well-known among villagers as a potent cure for rheumatics or back pain, and people consume this medicine as a supplement. This phenomenon may give rise to serious public health problems. The use of ineffective treatments may lead to often avoidable morbidities and the continuing spread of disease.

Traditional medicine in the research community is widely used in the prevention and treatment of both physical and mental ailments. Healers who are linked to the traditional medical system include the private home practice of traditional healers, *paraji*, and *dukun*. Certain components of the traditional medical system such as the use of MAC plants for self-medication and other traditional home remedies are also discussed.

The Sundanese people in rural areas still respect cultural leaders for their healing ability. The importance of social interaction and respect for cultural leaders provide favourable conditions for the development of the health promotion program. Generally, traditional healers come from society, with a low education level and low socio-economic status. They are usually domiciled for many years in the location where they work and are well known among people in their neighbourhood. They are involved personally in their clients' problems, compared to health care professionals.

*Secondly*, the selected research methodology is presented in Chapter III. As previously discussed, the ethnosystem approach, developed by the Leiden Ethnosystems' and Development (LEAD) Programme, aims to document and analyse Indigenous Knowledge Systems at the community level. This approach provides detailed analyses on the patterns of health care utilisation and people's behaviour by linking the historical processes and cultural perspectives involved in the recent developments. The Leiden Ethnosystems' Approach encompasses three methodological principles, namely the 'Participant's View' (PV), the 'Field of Ethnological Study' (FES), and the 'Historical Dimension' (HD), to gain a better understanding of the knowledge-belief-practice complex of the indigenous system in various settings. The 'Participant's View' (PV) corresponds to the *emic view* of subjective perspectives on local cosmovision, relationship with nature, and decision-making systems within a specific culture. In the context of health care utilisation behaviour, this approach can also be extended to the concept of medical pluralism in which the traditional, transitional, and modern medical systems co-exist within the community. Comparison with the medical system in the community provides a better understanding of the determinants of health care utilisation behaviour.

Furthermore, in order to analyse and explain the complex processes of health care utilisation in the pluralistic medical configuration, the present study adopts the multivariate 'Transcultural Health care Utilisation Model' developed by Buschkens & Slikkerveer (1982). This model provides a means to determine the relationship between various factors generating possible determinants in transcultural health care utilisation. The factors consist of sets of predisposing factors, enabling factors, perceived morbidity factors, institutional factors, environmental factors, and intervening factors.

Data on the knowledge-belief-practice complex of *ubar kampung* and the utilisation of three medical systems in the research area was collected quantitatively and qualitatively. Quantitative data was gathered from the household survey, while qualitative data came from an in-depth interview with key informants. The quantitative study was used to quantify the associations between the independent variables, intervening variables, and dependent variables by data analysis. The data was analysed at three levels: the univariate, bivariate and multivariate level. At the univariate level of analysis, descriptive statistics were used to present the socio-economic and demographic characteristics of the respondents. The bivariate analysis shows to what extent the dependent variable can be predicted from the independent and

intervening variables from the model. The final step, the multivariate analysis, provided a multidimensional conceptualization of health care utilisation by presenting mutual interactions among all variables in the model.

*Thirdly*, the description of the Tatar Sunda Region as the homeland for the Sundanese and the general profile of the communities in the five research villages based on the results of the qualitative study are presented in Chapter IV. As a wider context of the five selected villages, the Tatar Sunda Region refers to the cultural and mountainous region in West Java province, commonly identified as a homeland for the Sundanese community. In general, the natural environment of the Sunda region, as part of the Pacific Ring of Fire, is a more mountainous region than any other provinces in Indonesia, resulting in fertile volcanic soil. This particular feature of the environment makes agriculture the main livelihood of Sundanese people. Pangalengan, as one of the selected sub-districts in the present study, is well known as a productive plantation area for tea and a major producer of vegetables. The general diversity of plants not only favours the human use of plants but also nurtures local people's indigenous knowledge of plant species.

The brief historical overview demonstrates that the Sundanese have regarded mountains as spiritual sites; therefore indigenous knowledge on plants is usually enriched with a belief in mythological, religious, and spiritual elements. It is reflected by the fact that the highest mountain in West Java is considered sacred and has become the center of the Sunda Kingdom.

The five research villages were selected based on their geographic features, environmental characteristics such as rural/urban communities, and the local availability of health care services and facilities. By applying this specification, five villages are selected: Lamajang and Sukaluyu representing the rural environment; Cipanjalu and Ciporeat representing the semi-rural environment; and Katapang representing the urban environment.

The description and choice of the five research villages was concluded on the premise that local people in rural villages maintain their own local cultures and hold strong beliefs in their local wisdom, namely *tritangtu,* whereas in urban villages, the practice of local tradition in daily living is gradually disappearing. In general, the socio-demographic profiles of the inhabitants in the research area had an equal distribution of male and female inhabitants, 71.53% of the household members were still in the productive age, had finished basic education, were Sundanese, Muslims, and native inhabitants of the village. In addition to the local socio-demographic profiles, the inhabitants in the research village present a multifaceted character with several community settlements. In terms of occupation, there is a decrease in the agricultural sector due to less available land for farming. The socio-economic status of the inhabitants is dependent on the jobs available.

*Fourthly*, documentation of the knowledge, beliefs, and opinions on the traditional, transitional, and modern medical system in the research area are presented in Chapter V. As a country with numerous ethnic and cultural groups, community members are offered a range of medical services among the different systems that can be adopted. Traditional, transitional, and modern medical systems, combined into the plural medical system, are available in the research area.

In terms of the knowledge, beliefs, and practices of traditional medicine in West Java, the inhabitants of the five research villages were commonly familiar with medicinal plants and speak profoundly about their knowledge of traditional medicine, which in the research area is perceived as accessible, efficacious, affordable and culturally appropriate with Sundanese and Islamic beliefs.

Indigenous knowledge on MAC plants is identified as a major component of the traditional medical system. Knowledge of traditional medicine is generally transferred orally, mainly from the parents to their children. Most of the respondents are able to name the components of

traditional medicine, which includes the name, use of MAC plants and the recipe to make the *ubar kampung*. The results of this study indicate that despite the dominance of western medicine in the research area, people still have strong beliefs and positive opinions on traditional medicines.

Moreover, this study found that Sundanese people in the research area have achieved self-reliance on health based on their traditional medical knowledge. Supported by the potential of natural resources in the village, local inhabitants in the research area are able to practice self-medication. In addition, they also conduct ecosystem conservation by planting medicinal plants in their home garden.

As for the transitional medical system, the inhabitants in the research area present mixed characteristics of knowledge and opinion on the transitional medical system. This study found that knowledge of transitional medicine appears not to be influenced by the urban and rural characteristics of the location. Information on the transitional medical system in the research area is obtained generally from relatives, friends, advertisements, and drug sellers. Furthermore, the majority of the respondents in the research area share a positive opinion on the transitional medical system, associated with easy access to medicine and time savings.

Regarding the modern medical system, community members in the research area generally have little knowledge of modern medicines. Most respondents reported obtaining information about modern medicine from *kader* in *posyandu* or from health information posters. Despite a rather low level of knowledge in this field as reported by the respondents, the majority of the respondents in the research area hold positive opinions on the modern medical system in terms of the knowledge and experience of health care professionals and confidence in their diagnosis and treatments.

*Fifthly*, the local concepts of health and illness, which are based on local's people perceptions, are presented in Chapter VII. Local concepts of health and illness represent local people's knowledge and experience on health and healing practices, featuring unique aspects in the field of Indigenous Knowledge Systems. In general, the local concept of health is not only perceived in terms of physical health but also in psychological and social terms. Local practices to improve health are incorporated into various habits, such as balanced nutrition, avoidance of tobacco, keeping the environment clean, being kind to others, and being active in religious activities. Thus, the cause of an illness is also embedded within those components. Local people perceived a lack of exercise, smoking and an unhealthy environment, with too much pollution, trash, and frequent changes in weather, as having the potential to cause illness. From the philosophical and religious points of view, the Sundanese perceived illness as a test, reminder, or punishment from God. In relation with dietary patterns, the Sundanese local dietary habits are characterised by a high intake of vegetables in the form of *lalaban*. As the majority of Sundanese are Muslim, they also practice religious fasting during the month of Ramadhan. Those practices are considered beneficial for the management of mild to moderate metabolic diseases such as type 2 diabetes mellitus and hypertension.

*Sixthly*, the indigenous knowledge of MAC plants for diabetes mellitus is presented in Chapter VI. Documentation of the local knowledge on medicinal plants substantiates the focus of the present study on ethnomedicine for the treatment of diabetes mellitus. Ethnobotany and ethnomedical studies are recognized as the most effective methods in the discovery of new medicines (*cf.* Mahwasane *et al*. 2013). Data on MAC plants were collected through in-depth interviews with elders, traditional healers, and community leaders in a traditional community in the Sunda region. In total, 115 MAC plants for the promotion of general health and several ailments were reported by key informants and community members in the research area.

Furthermore, the twenty most commonly used plant species for the treatment of diabetes mellitus and its complications are presented in Table 6.2, section 6.3.

This study found that the majority of plant species used for the treatment of diabetes mellitus belong to the families of *Asteraceae* (2 species), *Lauraceae* (2 species), and *Liliaceae* (2 species). Most of the medicinal plants reported in the research area are already publicly acknowledged for their medicinal properties, indicating that their pharmacological activities have been studied in different areas. Medicinal plants such *Syzygium polyanthum, Moringa oleifera, Swietenia mahagoni, Allium sativum*, and *Cinnammomum burmanni* have been widely used in several regions by various ethnic groups. Leaves are the most frequently used plant part. Medicinal plants are either consumed as a single preparation or in a combination of several plants. In general, infusion and decoction are the most common plant preparation methods in the research area.

*Seventhly*, patterns of transcultural health care utilisation in the research area highlighting the different stages of utilisation of the plural medical system are presented in Chapter VII. It is evident that the pattern of health care utilisation behaviour is complex and medical pluralism exists in the research area. The results of this study show that regardless of location and proximity to health care facilities, people are open to whichever medical treatment is considered the best. Rather than using one medical system entirely, individuals' patterns of health care utilisation are varied, based on the nature of the illness. In this way, community members are flexible in combining different but complimentary medical systems to form holistic treatment plans.

On the basis of the household survey, each household member who experienced an episode of illness in a 12-month period reported their 'action' in the health-seeking process. As a considerable number of patients did not exclusively utilise one medical system, in order to adequately present the overall utilisation of the plural medical system, the number of 'patients' is transformed into 'utilisation rates'. Consequently, the number of 'utilisation rates' is higher than the number of 'patients'.

In view of the multiple utilisation of systems by patients, out of 360 patients, 2 abstained from using any medical system available in the research area, including self-medication and were thus categorized as 'non-action patients', whereas 358 patients reported taking some kind of action to treat reported diseases. Among 358 patients, 154 (43.02%) took one step to seek treatment, 155 (43.30%) took two steps, and 49 patients (13.68%) took three steps to seek treatment. The utilisation patterns of the plural medical system by 358 patients amounted to a total of 611 utilisation rates.

With regards to the total utilisation rates by patients, the modern medical system presents as the dominant medical system in the research area, accounting for 39.4% of total utilisation, followed by the transitional medical system (35.0%, n=214), and traditional medical system (25.5%, n=156). Patients generally contact modern medical services in severe/emergency conditions. In the research area, transitional medicine was mostly practised in the form of self-medication. In relation to the reported diseases, self-medication and/or the utilisation of over-the-counter medicine are common for acute conditions such as common cold, diarrhoea, cough, and moderate pain. The most frequently used medications include paracetamol, ibuprofen, *norit* (carbon active), sodium diclofenac, allopurinol and amoxicillin, which can be easily obtained from drug stores.

Traditional medicine is generally used as a follow-up to the utilisation of modern and transitional medicine in the second and third steps. Evidence shows that traditional and modern medical systems are often used in conjunction (cf. Marsland 2007; Xu & Chen 2011).

The main kind of utilisation of traditional medicine is in the form of herbal remedies. Herbal medicine is generally taken simultaneously with modern medicine for the treatment of chronic

diseases such as hypertension, diabetes, and rheumatoid arthritis. The following medicinal plants have been used for several ailments, not only in the research area but also in other regions in West Java: *babadotan* (*Ageratum conyzoides*), *antanan* (*Centella asiatica*), *daun baluntas* (*Clerodendron buchananii*), *cecendet* (*Physalis angulata*), *calincing* (*Physalis corniculata*), *biji mahoni* (*Swietenia mahagoni*), *daun jambu klutuk* (*Psidium guajava*), *daun kelor* (*Moringa oleifera*), *jawer kotok* (*Plectranthus scotellaroides*), and *daun sembung* (*Blumea balsamifera*)

As for diabetes mellitus, 212 diabetes patients generated 388 utilisation rates; out of 388 utilisation rates, traditional medicine accounted for 27.1%, transitional 29.5% and modern 43.8% utilisation by diabetes patients. The results indicate that modern health facilities were often represented as a point of departure or initial treatment before the patient followed through with other health providers, and most of the study participants regarded traditional medicine as a complementary treatment to conventional medicine.

*Eighthly*, the results of the stepwise bivariate, mutual relation, and multivariate analysis and their interactions among significant factors and variables are presented in Chapter VIII. Prior to the execution of the household survey, several potential determinants are identified during the pilot study. The identification of factors in health care utilisation, operationalisation of the multivariate model, and construction of the questionnaire are described in Chapter III.

The final dataset for transcultural health care utilisation consists of 611 utilisation rates from 358 action patients. The results of the bivariate analysis indicate that out of 52 identified variables within the multivariate model, 32 show a significant relationship with the health care utilisation variable. The statistically significant variables are further transformed into the 'mutual relation analysis' model developed by Slikkerveer, which is presented in Figure 8.1.

Following the bivariate analysis, the determinants which generate a certain degree of significance are summarized as follows :

*Set of Independent and Intervening Variables*

1. The pre-disposing socio-demographic factors consist of the variables :
   - Village
   - Age
   - Place of birth
   - Level of Education, and
   - Occupation
2. The pre-disposing psycho-social factors consist of the variables :
   - Knowledge of traditional medical system
   - Source of knowledge of traditional medical system
   - Belief in the traditional medical system
   - Opinion on the traditional medical system
   - Knowledge of transitional medical system
   - Opinion on the transitional medical system
   - Source of knowledge of modern medical system
   - Belief in the modern medical system
   - Knowledge of Diabetes Mellitus
3. The enabling factors consist of the variables: Expenses of health care services
4. The perceived morbidity factors consist of the variables :
   - Reported disease
   - Duration of disease
   - Complication of disease
5. The institutional factors consist of the variables :
   - Accessibility traditional medical system

- Accessibility transitional medical system
- Accessibility modern medical system
- Cost to access the transitional medical system
- Cost to access the modern medical system

6. The environmental factors consist of the variables:
   - Rural / urban residential
   - Residential status
   - Geographical characteristics
7. The intervening factors consist of the variables:
   - Impact of the policy on the traditional medical system
   - Impact of the policy on the transitional medical system
   - Impact of the policy on the modern medical system
   - Impact of BPJS
   - Impact of the promotion on the traditional medical system
   - Impact of the promotion on the transitional medical system
   - Impact of the promotion on the modern medical system

A graphic of the projection of components loading of the independent and dependent variables with a total of 35 variables on two dimensions is presented in Figure 8.2.

Finally, figure 8.3 presents the final model of Transcultural Health care Utilisation indicating the strength of the correlations between blocks and variables in the model. On the whole, the results of the multiple regression analysis show that the block of the predisposing socio-demographic factors and the block of the predisposing psycho-social factors correlate strongly with all blocks of independent factors and moderately with all blocks of dependent factors.

The theoretical, methodological and practical implications of the complementary study in health care utilisation, as the ninth objective in the present study is further elaborated in Paragraph 9.2

## 9.2 Implications of the Research

### 9.2.1 Theoretical Implications

The present study aims to provide contributions to the multidisciplinary field of ethnoscience, particularly ethnobotany and ethnomedicine. The indigenous medical knowledge in the present study primarily focus on the use of MAC plants by the Sundanese community, particularly for the treatment of diabetes mellitus. Therefore, the present study theoretically enriches the documentation of indigenous people knowledge of MAC plants.

The study highlights the importance to study of local people knowledge, belief, and practice of the indigenous medical system in the community. As concluded in the paragraph 9.1, the present study also supports the theorem that people knowledge of MAC plants poses as one major contribution to the utilisation of over-the-counter medicine and prescription medicine. The direct relation between the knowledge of MAC plants and the utilisation of transitional and modern medical system is shown by the nearly equal presentation of the utilisation of those systems.

Furthermore, this study makes an important potential contribution of traditional medical knowledge for ethnopharmacological research. Firstly, the study of traditional medical knowledge provides a better understanding of plants' efficacy in their cultural context. Secondly, research on traditional medical knowledge highlights how knowledge of medicinal

plants is distributed in a community. Thirdly, the study of indigenous medical knowledge enables the sustainability of cultural characteristics and the medical knowledge system of a community.

Moreover, although psycho-social and cultural aspects are also dominant factors in health care utilisation, the implementation of National Health care Coverage appears to have a major impact in the decision-making behaviour of health care utilisation. Despite the shortcomings of modern health care facilities in rural areas, the modern medical system presents as the predominant medical system, not only in the research area but also in the country.

Furthermore, documentation of indigenous knowledge and use of medicinal plants will provide greater significance to preserve knowledge and turn it into cultural heritage for the next generation. The qualitative data on MAC plants used for the treatment of diabetes mellitus serves as the basis of the discovery of new plant-based medicine which is urgently needed for the treatment of chronic diseases such as diabetes mellitus. Studies indicate that pharmacological screening of plants based on traditional use by local people results in a higher percentage of pharmacologically active components compared to random sampling (*cf.* Lewis & Elvin-Lewis 1995; Slikkerveer 2006). Moreover, as Reyes-Garcia (2010) concludes in her study, traditional knowledge of medicinal plants helps researchers to understand a plant's efficacy in its cultural context, improving our understanding of how indigenous knowledge is distributed within a society, and enhancing studies in the field of ethnopharmacology.

Additionally, the results will fill a gap in public health knowledge which contributes to improvements in health planning. Moreover, the study on the local concepts of health and illness helps improve health outcomes in the research area because health care practitioners and policy makers may have a better understanding of the health beliefs of local people, and potentially integrate local concepts of health and illness into their work.

### 9.2.2 Methodological Implications

The methodology employed in the present study, the 'ethnosystem approach', delivers a better understanding of the patterns of transcultural health care utilisation in the research area. The methodology which consists of three basic concepts, namely the *Participant's View* (PV), the *Field of Ethnological Study* (FES) and the *Historical Dimension* (HD), comprehensively described the knowledge-belief-practice complex of the indigenous system in various settings. In the context of health care utilisation behaviour, this approach can also be extended to the concept of medical pluralism.

Furthermore, the model of Transcultural Health Care Utilisation developed by Slikkerveer (1990) is suitable for examining the association between not only independent variables of predisposing factors, perceived morbidity, enabling factors, institutional factors and environmental factors with dependent variables of transcultural health care utilization, but also the association between intervening variables, namely public and private intervention with dependent variables. Moreover, this model is not only focused on one medical system, but also on cross-cultural medical systems. Observing changes in the patterns of transcultural health care utilization may be indicative of cultural shifts in knowledge and beliefs which affect treatment choices. This model is able to explain all determinant factors in the utilization of the plural medical system among the Sundanese community.

Additionally, the mixed-method design of the qualitative and quantitative study allowed for triangulation from multiple data sources and reproducible methods. The stepwise bivariate, mutual relation, multivariate, and multiple regression analysis used in the present study is based on the analytical model of transcultural health care utilisation which is very well-developed for this kind of ethnomedical study. The remarkable analytical results of this study which were

elaborated in Chapter VIII support previous studies in the field of ethnoscience and confirm that this analytical model is suitable for the study of human utilisation behaviour.

Following the distinction of the integrated approach of the traditional and modern medical system, the Leiden Ethnosystems' Approach provides a better perspective to integrate the utilisation of traditional medicine by the local people with the public health service. This study highlights the potential of the contribution of indigenous institutions to sustainable community-based development using the concept of 'Integrated Community-Managed Development (ICMD)' developed by Slikkerveer (2019). As cited in Saefullah (2019): '*the approaches encompass not only the economic dimensions of the community, but also education, health, communication, and socio-cultural factors'*

### 9.2.3 Practical Implications

The present study seeks to provide practical contributions to the treatment of diabetes mellitus not only in the Sunda Region, but also nationwide. The data of the study will be useful in planning and developing effective public health intervention for the treatment of diabetes mellitus, resulting in decreased physical and social burden for the target population. In the present study, determinants which influence health care utilisation will help in identifying barriers to the successful implementation of public health intervention in the target population. The community-based approach in the transcultural health care utilisation of the present study elucidates the *emic* perspective of health care needs and their limitations. The results are more generalisable across regional populations. With this regard, the analysis of the results of this study has a predictive value for future health care planning. Furthermore, this study presents each medical system which co-exists in the research area within the socio-cultural context, therefore generating a practical community-oriented perspective on medical pluralism.

In relation with diabetes, given the enormous burden caused by the disease, it is important to develop culturally appropriate public health policies for the treatment of diabetes mellitus. This study identified the determinants of health care utilisation among diabetes patients and traditional medicines used by the Sundanese community for the treatment of diabetes mellitus.

The patterns of health care utilisation behaviour are analysed based on reports from the respondents, and not the health care providers, promoting community-based health care improvement in the research area and elsewhere. As previously reported, community participation in the treatment of chronic diseases and region-specific data are crucial factors in the improvement of health care delivery strategies and the development of culturally appropriate health policies, particularly in developing countries (*cf.* Staten *et al.* 2012; Banna & Bersamin 2018; Haldane *et al.* 2019).

Moreover, the results of the present study provide evidence that the Sundanese community in the research area possesses a substantial amount of knowledge of MAC plants and extensively use traditional medicine for the treatment of several ailments. In this way, these findings are in line with the WHO's strategy which promotes the utilisation of traditional medicine to improve community health care in rural communities. Utilisation of herbal medicine provides advantages in terms of accessibility and affordability. Utilisation of herbal medicine for the treatment of chronic disease also minimizes the side effects of the long-term use of chemical-based medicine.

In the utilisation of over-the-counter medicines, there is a substantial degree of self-medication without any professional health care advice. Despite their ease of accessibility, the practice of self-medication also renders negative consequences. In order to mitigate the potential risks of self-medication, the pharmacist plays a valuable role in identifying and preventing drug-related problems for achieving patients' optimal outcomes.

Furthermore, the present study also promotes the integration of the traditional medical system with the formal health care system, since traditional medicine not only holds a significant position among the local community but also gives a more patient-oriented approach in the treatment of chronic diseases. This study links up with the WHO's recent Traditional Medicine Strategy 2014-2023 which aims to: '*promote the safe and effective use of traditional medicine by regulating, researching, and integrating TM [traditional medicine] products, practitioners, and practices into health systems, where appropriate.'* Additionally, current implementation of the National Health care Coverage which poses a significant factor in the utilisation of both traditional and modern medical systems has further emphasised the need to integrate traditional medicine into the national health care system.