Chapter VIII. PATTERNS OF UTILISATION OF THE PLURAL HEALTH INFORMATION & COMMUNICATION SYSTEM (PHICS)

This chapter presents the quantitative analysis of the data collected during the household surveys conducted in the research area of Sukamiskin in the regency of Bandung. These household surveys have been conducted as an extension to the preceding qualitative research with a view to measuring and analysing the spread of these findings over the entire community. A description is presented of the way in which the sample surveys are showing the correlations between the independent and intervening variables of the inhabitants of Sukamiskin and their utilisation behaviour of the Plural Health Information & Communication System (PHICS), sub-divided over the Traditional and Modern Health Information & Communication Systems (T&MHICD) for the improvement of their health. In order to document and understand the quantitative outcome data, different categories of variables are analysed which can potentially be identified as significant determinants of the reported utilisation patterns of the respondents in Sukamiskin. In this way, the conceptual model which has been applied to this study is presented as the basis of the stepwise statistical analysis of the quantitative data whereby the categories of respectively predisposing, enabling, and intervening variables are analysed as possible significant variables, *i.e.* determinants of the dependent variables of utilisation of the Plural Health Information & Communication System.

The quantitative analysis uses the data obtained through the structured questionnaires which have been completed in 125 households through information provided by the household head selected in Sukamiskin for the sample surveys. The Chapter continues to provide information on the way in which the data are subsequently entered into an electronic database, followed by a number of steps taken in order to prepare the data for the final analysis in SPSS.

It is shown, that the data are initially subjected to a bivariate analysis, in which the independent and intervening variables are distributed over the dependent variables through the method of cross-tabulation. As mentioned above, the dependent variables have been divided into two categories of utilisation, respectively: the Traditional Health Information & Communication System (THICS) and the Modern Health Information & Communication System (MHICS), with a view to adequately representing the reported utilisation of the Plural Health Information & Communication System (PHICS).

The significant variables which have been identified as influencing the Traditional and Modern Health Information & Communication Systems (T&MHICD) are described specifying their weight, distributed over the various levels of influence, encompassing the scores (2, 3 or 5) which in this case include the 5 scores of ‘very low’; ‘low’; ‘average’; ‘high’ and ‘very high’ in the model of Mutual Relations Analysis. Subsequently, the influence of all independent and intervening variables on the dependent variables is measured in relation to the interaction among and between all variables. In this way, the results of the multivariate analysis using the OVERALS technique are shown to identify the relative influence of the variables, *i.e.* the specific determinants of the utilisation behaviour of respondents of the Plural Health Information & Communication System (PHICS).

Finally, the multiple regression analysis is presented with a view to assessing the correlations and related weights among and between the different groups of variables which are presented as blocks of variables in the model. This chapter concludes with an interpretation and discussion of the results of the quantitative analysis in relation to the structure of the final analytical model.

8.1 Bivariate and Mutual Relations Analysis

8.1.1 Preparation of the Analysis: Data Sets and Variables

On the basis of the conceptual model selected for this study, two sets of data encompassing the different categories or blocks of variables in two sets have been identified, as follows:

Set 1
Independent Variables
Block 1 Predisposing Socio-Demographic Variables
Block 2 Predisposing Psycho-Social Variables
Block 3 Enabling Variables
Block 4 Perceived Need of Health Information Variables
Block 5 Institutional Variables

Intervening Variables
Block 6 Intervening Variables

Set 2
Dependent Variables
Block 7: Utilisation of Traditional Health Information & Communication Systems (THICS)
Block 8: Utilisation of Modern Health Information & Communication Systems (MHICS)

From the original answer categories of all the 137 questions in the quantitative questionnaire, 23 variables, *i.e.* 21 independent and 2 dependent variables as described in detail below, have been created and labelled, partly through methods of recalculation. The particular label which is assigned to each variable within the statistical programme for data analysis (using SPSS), is presented in parenthesis after the name of the variable. Since virtually all of the 125 survey respondents adhere to Islam, the variable 'religion' has been deleted from the data set. The total of 23 variables include the following socio-demographic variables, psycho-social variables, enabling variables, perceived need of health information variables, institutional variables, intervening variables and dependent variables:

Set 1: *Independent Variables*
Predisposing Socio-Demographic Variables (4):
'**Household Size**' ('HHsize'): 'Household Size' assesses the total number of family members living with the household head. The variable was not subjected to recalculation whereupon the following original answer categories are used in the analysis as scores: 'one'; 'two'; 'three'; 'four'; 'five'; 'six'; 'seven'; 'eight'; 'nine'; and 'ten'.
'**Age'** ('Age'): Similar to 'Household Size', the variable 'Age' did not require any recalculation. The following original answer categories are used in the analysis as scores: '26-30'; '31-35'; '36-40'; '41-45'; '46-50'; '51-55'; '56-60'; '61-65'; '66-70'; and '71-75'.
'**Formal Education'** ('EduForm'): Subject to recalculation, the original answer categories as scores of 'no education', 'elementary school not finished', 'elementary school finished', 'secondary school not finished', 'secondary school finished', 'senior high school not finished', 'senior high school finished', 'diploma not finished', 'diploma finished', 'bachelor not finished', 'bachelor finished', 'master degree' and 'PhD' have been reduced to 'no education', 'primary school', 'secondary school', 'senior high school' and 'university'.

‘**Profession’** (‘Prof’): Similar to ‘Formal Education’, answer categories have been regrouped from ‘main occupation’ and ‘additional occupation’ which included eleven categories, to ‘farmer’, ‘teacher’, ‘personal servant’, ‘civil servant’, ‘religious leader’, ‘entrepreneur’, ‘labourer’, ‘private sector worker’, ‘unemployed’, ‘retired’ and ‘other’. The ‘other’ category refers to military personnel, caddies and taxi drivers (*ojek*).

Predisposing Psycho-Social Variables (9):
‘**Knowledge Level on Traditional Medicine’** (‘KnowTHI’): As a result of methods of recalculation which have been applied to the original answer categories, this variable came to include the following five scores: ‘very little’; ‘little’; ‘average’; ‘much’; and ‘very much’.
‘**Knowledge Level on Modern Medicine**’ (‘KnowMHI’): Regrouping of the original answer categories similarly resulted in the distinction of the scores ‘very little’, ‘little’, ‘average’, ‘much’ and ‘very much’ as the scores of this variable.
‘**Knowledge of Availability of Libraries**’ (‘KnowLib’): Following processes of recalculation, the categories of this variable eventually included the scores ‘very little awareness’, ‘little awareness’, ‘average awareness’, ‘much awareness’ and ‘very much awareness’.
‘**Belief in Power of Traditional Medicine**’ (‘BeliefTHI’): Responses within the original answer categories have been combined and regrouped as scores into ‘low belief’, ‘average belief’ and ‘strong belief’.
‘**Belief in Power of Modern Medicine**’ (‘BeliefMHI’): Likewise, the original answer categories have been combined and regrouped as scores, thereby resulting in ‘low belief’, ‘average belief’ and ‘strong belief’.
‘**Belief in Power of Printed Word**’ (‘BeliefPW’): Similar to ‘Belief in Power of Traditional Health Information’ and ‘Belief in Power of Modern Health Information’, the answer categories of this variable have been regrouped as scores for ‘low belief’, ‘average belief’ and ‘strong belief’.
‘**Opinion on the Quality of Health Information**’ (‘OpQualHI’): The original answer categories have been subjected to methods of recalculation and eventually resulted in the following five scores: ‘very low appreciation’; ‘low appreciation’; ‘average appreciation’; ‘high appreciation’; and ‘very high appreciation’.
‘**Opinion on the Cost of Health Information**’ (‘OpCostHI’): The original answer categories of this variable underwent a similar method of recalculation whereby they resulted in the scores ‘very low’, ‘low’, ‘average’, ‘high’ and ‘very high’.
‘**Opinion on the Service of Health Information**’ (‘OpServHI’): In the same fashion, the original answer categories of the variable ‘Opinion on the Service of Health Information’ have been regrouped into the scores ‘very low’, ‘low’, ‘average’, ‘high’, and ‘very high’.

Enabling Variables (1):
‘**Socio-Economic Status**’ (‘SES’): In the quantitative analysis of data, the enabling variable ‘Socio-Economic Status’ which assesses the economic capability of each individual to make use of the available Health Information & Communication Systems was generated through factor analysis. Factor analysis is executed on a series of related variables including financial resources, family income, property of land, cost of livelihood, house and domestic animal resources, property of transportation tools and social status. The original answer categories of all variables were eventually regrouped into the scores ‘poor’, ‘average’ and ‘well-to-do’.

Perceived Need of Health Information Variables (2):
'**Need Traditional Health Information**' ('NeedTHI'): Subject to methods of recalculation, this variable came to include the following answer categories as three scores: 'low perceived need'; 'medium perceived need'; and 'high perceived need'.
'**Need Modern Health Information**' ('NeedMHI'): In the same fashion, the original answer categories of this variable have been regrouped into the scores 'low perceived need', 'medium perceived need' and 'high perceived need'.

Institutional Variables (2):
'**Exposure to Institutional Health Information**' ('ExpoHI'): Recalculations have been carried out on the original answer categories of this variable. As a result, the following new scores have been introduced: 'very low'; 'low'; 'average'; 'high'; and 'very high'.
'**Member Health Information Institution**' ('MemInst'): Likewise, the categories of this variable are a result of recalculation and include the scores 'very few', 'few', 'average', 'many' and 'very many'.

Intervening Variables: (3):
'**Exposure to Electronic Media**' ('ExpoElec'): The original answer categories of the variable 'Exposure to Electronic Media' have been regrouped into the scores 'very low exposure', 'low exposure', 'average exposure', 'high exposure' and 'very high exposure'.
'**Exposure to Printed Media**' ('ExpoPrint'): Similarly, responses to the original answer categories of this variable have been restructured thereby resulting in the scores 'very low exposure', 'low exposure', 'average exposure', 'high exposure' and 'very high exposure'.
'**Awareness of Epidemics**' ('Epidemics'): Since this variable was not subjected to methods of recalculation, the following original answer categories are used in the analysis as the scores: 'no' and 'yes'.

Set 2: *Dependent Variables* (2):
The dependent variables encompass the Plural Health Information & Communication System (PHICS), and are sub-divided into 2 sub-systems: the Traditional Health Information & Communication System (THICS) and the Modern Health Information & Communication System (MHICS).
'**Utilisation of Traditional Health Information & Communication System** ('UseTHI'): The original answer categories of this variable have been established on the basis of the responses which the household head has provided to the questions regarding the utilisation of the Traditional Health Information & Communication System (THICS) over a period of twelve months preceding the household surveys. In this way, the variable was recalculated on the basis of three questions regarding the frequency, with which respondents obtained traditional health information on medical treatment, disease prevention and health promotion. The answer categories have been regrouped into the following five scores: 'very low utilisation'; 'low utilisation'; 'average utilisation'; 'high utilisation'; and 'very high utilisation'.
'**Utilisation of Modern Health Information & Communication Systems**' ('UseMHI'): In the same fashion, this variable was recalculated on the basis of three questions which related to the frequency of receiving modern health information on medical treatment, disease prevention and health promotion for each respondent. The original answer categories of this variable similarly offered a detailed assessment of the household head's utilisation of the Modern Health Information & Communication System (MHICS) over a period of twelve months preceding the

survey and have been regrouped into the scores of 'very low utilisation', 'low utilisation', 'average utilisation', 'high utilisation' and 'very high utilisation'.
The variables presented above are first subjected to the bivariate analysis which is carried out through the method of cross-tabulation. In this way, each of the 21 independent variables, *i.e.* the predisposing socio-demographic and psycho-social, enabling, perceived need of health information, institutional and intervening variables, is distributed over the two dependent variables, upon which the relationship between the variables is presented in the form of frequency distributions within a cross-tabulation. In order to determine whether there is a statistically significant correlation between the respective independent variable and the dependent variables, Pearson's Chi-square test is applied to each cross-tabulation.

This test has been selected, since according to Aiglsperger (2014: 240): '*[…] [T]he test calculates the degree of probability, to which the relationship between the variables occurs by chance. Accordingly, the more significant the results of the Chi-square test are, the less likely it is that the relationship between variables occurs by chance*' [1].

Following Slikkerveer (1990), Agung (2005), Djen Amar 2010) and Aiglsperger (2014), the levels of significance values of the Pearson's Chi-square test are arranged as follows:

<.001 - 'most strongly significant';
.01 to .001 - 'very strongly significant';
.05 to .01 - 'strongly significant';
.10 to .05 - 'weakly significant';
.15 to .10 - 'indication of significance'; and
>.15 - 'non-significant'.

Following Pearson's Chi-Square test, the exact test of Cramer's V is applied to the cross-tabulation in order to further explore the strength of the relationship between the variables. Generally, the occurrence of significance within the correlation between two variables refers to a degree of probability rather than to an automatically occurring association between variables. In order to closely study the relationship between all variables in the model, the quantitative analysis of the research findings hereafter extends beyond the bivariate analysis of cross-tabulations of variables towards a multivariate and multiple regression analysis.

8.2 Results of the Bivariate Analysis

In general, the bivariate analysis is a measurement which tests the correlation between the variables in the analytical model, in this case between the independent and intervening variables and the dependent variables, while also indicating the weight of the categories or scores of the variables, often amounting to 2, 3 or 5 scores. In other words, the bivariate analysis calculates the strength, *i.e.* the significance, of each relationship between on the one hand the independent and intervening variables, and on the other hand the two categories of dependent variables, and indicates the related weight. The independent variables include predisposing socio-demographic and psycho-social variables, enabling variables, perceived need of health information variables and institutional variables as well as intervening variables.

The dependent variables refer to the reported utilisation by the respondents of the two - traditional and modern - components of the Plural Health Information & Communication System (PHICS) available in the research area. The level of significance of each relationship between variables is indicated by the results of Pearson's Chi-Square test. The application of the rank order of levels of significance presented above qualifies the relationship between the two

variables as either most strongly significant, very strongly significant, strongly significant, weakly significant, an indication of significance or non-significant. The general distribution of the independent and intervening variables over the dependent variable of the levels of utilisation of the Traditional Health Information & Communication System (MHICS) shows a range from the score for 'very low utilisation' of 85 (68.0%) to the score for 'very high utilisation' of 18 (14.4%) of the score of 'very high utilisation'. A similar general distribution of the independent and intervening variables over the dependent variable for the levels of utilisation of the MHICS shows a range from the score for 'very low utilisation' of 76 (60.8%) to the score for 'very high utilisation' of 15 (12.0%) (cf. Tables 8.1 – 8.6). The following description of the relationships between the independent, intervening and dependent variables will be presented as far as a certain level of significance has been found.

8.2.1 Predisposing Variables

Identified in the model as predisposing, *i.e.* background, variables, the socio-demographic and psycho-social variables are presumably affecting the utilisation patterns of the Health Information & Communication Systems (HICS) by respondents at the individual level in a differential way. The socio-demographic variables refer to 'household size', 'age', 'formal education' and 'profession'.

The psycho-social variables distinguish between 'knowledge level on traditional medicine', 'knowledge level on modern medicine', 'knowledge of availability of libraries', 'belief in power of traditional medicine', 'belief in power of modern medicine', 'belief in power of printed word', 'opinion on the quality of health information', 'opinion on the cost of health information' and 'opinion on the service of health information'. As indicated before, not only the level of significance is calculated, but also the weights of these variables are measured and recorded according to the related scores in the output in SPSS.

Table 8.1 shows the distribution of the significant socio-demographic variables in Block 1 over the two dependent variables (N=125), as follows:

'Age'
In the category of socio-demographic variables, a *strongly significant* correlation is found between the variable 'Age' and the reported pattern of utilisation of the Modern Health Information & Communication System (MHICS) (Pearson's Chi-Square = .022). In the utilisation pattern, the category of 'Age between 56-60 years' shows the relatively high number of 11 (68.7%) with the score of 'Very low utilisation' for the MHICS. In the same category, no other comparable significant correlations of the variable 'Age' are found (*cf.* Table 8.1).

'Profession'
In the same category, a *weakly significant correlation* is found between the variable 'Profession' and the reported pattern of utilisation of the Traditional Health Information & Communication System (THICS) (Pearson's Chi-Square = .022). In the utilisation pattern, the category of 'Unemployed' shows the relatively high number of 10 (90.9%) with the score for 'Very low utilisation' of THICS. In the same category, no other comparable significant correlations of the variable 'Profession' are found (*cf.* Table 8.1).

Table 8.2 shows the distribution of the significant psycho-social variables in Block 2 over the two dependent variables (N=125), as follows:

'Knowledge Level on Traditional Medicine'
In the category of psycho-social variables, a very *strongly significant* correlation is found between the variable 'Knowledge Level on Traditional Medicine' and the reported pattern of utilisation of the Traditional Health Information & Communication Systems (THICS) (Pearson's Chi-Square = .004). In the utilisation pattern, the category of respondents with 'Very little knowledge of traditional medicine' show the relatively high number of 9 (90.0%) with the score for 'very low utilisation' of THICS.

Similarly, in the category of psycho-social variables, a *weakly significant* correlation is found between 'Knowledge Level on Traditional Medicine' and the utilisation of the Modern Health Information & Communication System (MHICS) (Pearson's Chi-Square = .064). In the utilisation pattern, the category of respondents with 'Very little knowledge of traditional medicine' also show the relatively high number of 10 (100.0%) with the score of 'very low utilisation' of the MHICS (*cf.* Table 8.2).

'Knowledge level on Modern Medicine'
In the category of psycho-social variables, a *most strongly significant* correlation is found between the variable 'Knowledge Level on Modern Medicine' and the reported pattern of utilisation of the Traditional Health Information & Communication Systems (THICS) (Pearson's Chi-Square = .000). In the utilisation pattern, the category of respondents with 'Very little knowledge of modern medicine' show the relatively high number of 28 (80.0%) with the score for 'Very low utilisation' of the THICS.

Similarly, in the category of psycho-social variables, a *very significant* correlation is found between 'Knowledge Level on Modern Medicine' and the utilisation of the Modern Health Information & Communication System (MHICS) (Pearson's Chi-Square = .001). In the utilisation pattern, the category of respondents with 'Very little knowledge of modern medicine' also show the relatively high number of 19 (76.0%) with the score for 'Very low utilisation' of the MHICS (*cf.* Table 8.2).

'Knowledge of Availability of Libraries'
In the category of psycho-social variables, a *weakly significant correlation* is found between the variable 'Knowledge of Availability of Libraries' and the reported pattern of utilisation of the Traditional Health Information & Communication Systems (THICS) (Pearson's Chi-Square = .079). In the utilisation pattern, the category of respondents with 'Little knowledge of the availability of libraries' show the relatively high number of 35 (66.0%) with the score for 'Very low utilisation' of THICS.

In contrast, in the category of psycho-social variables, a *strongly significant* correlation is found between 'Knowledge of Availability of Libraries' and the utilisation of the Modern Health Information & Communication System (MHICS) (Pearson's Chi-Square = .040). In the utilisation pattern, the category of respondents with 'Very much knowledge of availability of libraries' also show the relatively high number of 6 (75.0%) with the score for 'Very high utilisation' of MHICS (*cf.* Table 8.2).

'Belief in Power of the Printed Word'
In the category of psycho-social variables, a *weakly significant correlation* is found between the variable 'Belief in Power in the Printed Word' and the reported pattern of utilisation of the

Modern Health Information & Communication Systems (MHICS) (Pearson's Chi-Square = .077). In the utilisation pattern, the category of respondents with such 'Low belief in the Printed Word' show the relatively high number of 12 (85.7%) with the score for 'Very low utilisation' of the Traditional Health Information & Communication Systems (THICS). In the same category, no other comparable significant correlations of the variable 'Belief in Power of the Printed Word' are found (*cf.* Table 8.2).

8.2.2 Enabling Variables

Table 8.3 shows the distribution of the significant enabling variables in Block 3 over the two dependent variables (N=125), as follows:

'Socio-Economic Status' (SES)'
In the category of enabling variables, a *weakly significant correlation* is found between the variable 'Socio-Economic Status (SES)' and the reported pattern of utilisation of the Traditional Health Information & Communication Systems (THICS) (Pearson's Chi-Square = .065). In the utilisation pattern, the category of respondents with 'Poor SES' show the relatively high number of 50 (75.8%) with the score for 'Very low utilisation' utilisation for THICS.

Similarly, in the category of enabling variables, a *strongly significant* correlation is found between the variable 'Socio-Economic Status (SES)' and the utilisation of the Modern Health Information & Communication System (MHICS) (Pearson's Chi-Square = .022). In the utilisation pattern, the category of respondents with 'Poor SES' also show the relatively high number of 45 (68.2%) with a score for 'Very low utilisation' of MHICS (*cf.* Table 8.3).

8.2.3 Perceived Need of Health Information Variables

Table 8.4 shows the distribution of the significant perceived need of modern health information variables in Block 4 over the two dependent variables (N=125), as follows:

'Need of Modern Health Information'
In the category of perceived need of health information variables, a *most strongly significant* correlation is found between the variable 'Need of Modern Health Information' and the reported pattern of utilisation of the Traditional Health Information & Communication Systems (THICS) (Pearson's Chi-Square = .000). In the utilisation pattern, the category of respondents with a 'Medium perceived need of modern health information' show the relatively high number of 77 (68.7%) with the score for 'Very low utilisation' of THICS.

Similarly, in the same category of 'Need of Modern Health Information', a *most strongly significant* correlation is found between the variable 'Need of Modern Health Information' and the reported pattern of utilisation of the Modern Health Information & Communication Systems (MHICS) (Pearson's Chi-Square = .000). In the utilisation pattern, the category of respondents with a 'Medium perceived need of modern health information' show the relatively high number of 72 (64.3%) with a score for 'Very low utilisation' of MHICS (*cf.* Table 8.4).

8.2.4 Institutional Variables

Table 8.5 shows the distribution of the significant institutional variables in Block 5 over the two dependent variables (N=125), as follows:

'Member Health Information Institution'
In the category of institutional variables, a *strongly significant* relationship is found between the variable 'Member Health Information Institution' and the reported pattern of utilisation of the Traditional Health Information & Communication System (THICS) (Pearson's Chi-Square = .018). In the utilisation pattern, the category of respondents with 'Very few memberships' show the relatively high number of 51 (71.8%) with the score for'Very low utilisation' of THICS. In the same category, no other comparable significant correlations of the variable 'Member Health Information Institution' are found (*cf.* Table 8.5).

8.2.5 Intervening Variables

Table 8.6 shows the distribution of the significant intervening variables in Block 6 over the two dependent variables (N=125), as follows:

'Exposure to Electronic Media'
In the category of intervening variables, a *very strongly significant* correlation is found between the variable 'Exposure to Electronic Media' and the reported pattern of utilisation of the Traditional Health Information & Communication Systems (THICS) (Pearson's Chi-Square = .003). In the utilisation pattern, the category of respondents with 'Low exposure to Electronic Media' show the relatively high number of 48 (78.7%) with the score for 'Very low utilisation' of THICS.

Similarly, in the category of intervening variables, a *very strongly significant* correlation is found between the variable 'Exposure to Electronic Media' and the utilisation of the Modern Health Information & Communication System (MHICS) (Pearson's Chi-Square = .001). In the utilisation pattern, the category of respondents with a 'Low exposure to Electronic Media' show the relatively high number of 42 (68.8%) with the score for 'Very low utilisation' of MHICS (*cf.* Table 8.6).

'Exposure to Printed Media'
In the category of intervening variables, a *very strongly significant* correlation is found between the variable 'Exposure to Electronic Media' and the reported pattern of utilisation of the Traditional Health Information & Communication Systems (THICS) (Pearson's Chi-Square = .024). In the utilisation pattern, the category of respondents with 'Low exposure to Printed Media' show the relatively high number of 68 (75.6%) with the score for 'Very low utilisation' of THICS.

Similarly, in the category of intervening variables, a *very strongly significant* correlation is found between the variable 'Exposure to Printed Media' and the utilisation of the Modern Health Information & Communication System (MHICS) (Pearson's Chi-Square = .005). In the utilisation pattern, the category of respondents with a 'Low exposure to Printed Media' show the relatively high number of 61 (67.7%) with the score for 'Very low utilisation' of MHICS (*cf.* Table 8.6).

'Awareness of Epidemics'
In the category of intervening variables, a *strongly significant* correlation is found between the variable 'Awareness of Epidemics' and the reported pattern of utilisation of the Traditional Health Information & Communication Systems (THICS) (Pearson's Chi-Square = .019). In the utilisation pattern, the category of respondents *with* an 'Awareness of Epidemics' show the relatively high number of 46 (80.7%) with the score for 'Very low utilisation' of THICS.

Similarly, in the category of intervening variables, a *very strongly significant correlation* is found between the variable 'Awareness of Epidemics' and the utilisation of the Modern Health Information & Communication System (MHICS) (Pearson's Chi-Square = .006). In the utilisation pattern, the category of respondents *with* an 'Awareness of Epidemics' show the relatively high number of 44 (77.2%) with the score for 'Very low utilisation' of MHICS (*cf.* Table 8.6).

8.2.6 Dependent Variables

'Use of Traditional Health Information & Communication Systems'
The dependent variable identified in the analytical model as the variable 'Use of Traditional Health Information & Communication Systems' in Block 7 shows various levels of a significant correlation with the following variables:

Block 1	
Predisposing Socio-Demographic Variables:	'Age'
	'Profession'
Block 2:	
Predisposing Psycho-Social Variables:	'Knowledge Level on Traditional Medicine'
	'Knowledge Level on Modern Medicine'
	'Knowledge of Availability of Libraries'
Block 3:	
Enabling Variables:	'Socio-Economic Status (SES)'
Block 4:	
Perceived Need of Health Information Variables:	'Need Modern Health Information'
Block 5:	
Institutional Variables:	'Member Health Information Institution'
Block 6	
Intervening Variables:	'Exposure to Electronic Media'
	'Exposure to Printed Media'
	'Awareness of Epidemics'

'Use of Modern Health Information & Communication Systems'
The dependent variable identified in the analytical model as the variable 'Use of Modern Health Information & Communication Systems' in Block 8 shows various levels of a significant correlation with the following variables:

Block 1:	
Predisposing Socio-Demographic Variables:	'Age'
Block 2:	
Predisposing Psycho-Social Variables:	'Knowledge Level on Traditional Medicine'
	'Knowledge Level on Modern Medicine'
	'Knowledge of Availability of Libraries'
	'Belief in Power of the Printed Word'
Block 3:	
Enabling Variables:	'Socio-Economic Status (SES)'
Block 4:	
Perceived Need of Health Information Variables:	'Need Modern Health Information'

Block 6:
Intervening Variables: 'Exposure to Electronic Media'
'Exposure to Printed Media'
'Awareness of Epidemics'

8.3 Mutual Relations Analysis

8.3.1 Overview of Significant Variables

In order to further assess the overall configuration of the results of the bivariate analysis concerning the correlations in the different independent and intervening blocks of variables in relation to the three dependent blocks of variables identified in the analytical model, an overview is presented in Table 8.7 of the variables which show statistically significant values for Pearson's Chi-square test, with the respective values and levels of significance.

Table 8.1 Significant Variables resulting from the Bivariate Analysis.

Set, Block and Name of the Variable	Value	Level of Significance
Independent Variables		
Block 1: Predisposing Socio-Demographic Variables		
Age of MHICS	.022	'strongly significant'
Profession of THICS	.056	'weakly significant'
Block 2: Predisposing Psycho-Social Variables		
Knowledge Level on Modern Medicine of THICS	.000	'most strongly significant'
Knowledge Level on Traditional Medicine of THICS	.004	'very strongly significant'
Knowledge Level on Traditional Medicine of MHICS	.064	'weakly significant'
Knowledge Level on Modern Medicine of MHICS	.001	'very strongly significant'
Knowledge of Availability of Libraries of MHICS	.040	'strongly significant'
Knowledge of Availability of Libraries of THICS	.079	'weakly significant'
Belief in Power of the Printed Word of MHICS	.077	'weakly significant'
Block 3: Enabling Variables		
Socio-Economic Status (SES) of MHICS	.022	'strongly significant'
Socio-Economic Status (SES) of THICS	.065	'weakly significant'
Block 4: Perceived Need of Health Information Variables		
Need Modern Health Information of THICS	.000	'most strongly significant'
Need Modern Health Information of MHICS	.000	'most strongly significant'
Block 5: Institutional Variables		
Member Health Information Institution of THICS	.018	'strongly significant'
Intervening Variables		
Block 6: Intervening Variables		
Exposure to Electronic Media of MHICS	.000	'most strongly significant'
Exposure to Electronic Media of THICS	.003	'very strongly significant'
Exposure to Printed Media of MHICS	.005	'very strongly significant'
Awareness of Epidemics of MHICS	.006	'very strongly significant'

(Continued) Table 8.1

Set, Block and Name of the Variable	Value	Level of Significance
Exposure to Printed Media of THICS	.024	'strongly significant'
Awareness of Epidemics of THICS	.019	'strongly significant'

8.3.2 Model of Mutual Relations Analysis

As indicated in Figure 8.1 as well as in Table 8.7, the most strongly significant variables in Block 2, *i.e.* the predisposing psycho-social variables, with a value of Pearson's Chi-square test of .000 relates to the 'Knowledge Level on Modern Medicine' of respondents who report the utilisation of the Traditional Health Information & Communication Systems. In addition, most strongly significant variables which similarly show a Pearson's Chi-Square test value of .000 are found in Block 4, *i.e.* among the perceived need of health information variables.

The bivariate analysis also reveals that the variable 'Need Modern Health Information' is most significantly related with patterns of reported utilisation by the respondents of both the traditional and modern health information & communication systems. Finally, the variable 'Exposure to Electronic Media' in Block 6 of the intervening variables shows a most strongly significant value of .000 in relation to patterns of behaviour of respondents who report the utilisation of the modern health information & communication system.

Figure 8.1 shows the Mutual Relations Model, developed by Slikkerveer (2012), in which the variables with a certain degree of significance resulting from the bivariate analysis are represented as groups in their related blocks of variables of the analytical model, as such providing an overview of the significant blocks in the overall configuration of independent, intervening and dependent variables.

It is evident that the model provides a clear indication of the dominant role which the significant psycho-social variables (7) and the significant intervening variables (6) are playing in the overall configuration of interaction among the independent (14) and intervening (6) variables in correlation with the dependent variables (2). The next paragraph further provides an overview of all significant variables of the model.

Table 8.2 Distribution of the Significant Socio-Demographic Variables over the Dependent Variables (N=125).

Variable	Utilisation of Traditional Health Information & Communication Systems (THICS)												Utilisation of Modern Health Information & Communication Systems (MHICS)											
	Very low		Low		Average		High		Very high		Total		Very low		Low		Average		High		Very high		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Age																								
26-30 years	1	100.0	-	-	-	-	-	-	-	-	1	100.0	-	-	-	-	1	100.0	-	-	-	-	1	100.0
31-35 years	5	62.5	3	37.5	-	-	-	-	-	-	8	100.0	6	75.0	1	12.5	-	-	1	12.5	-	-	8	100.0
36-40 years	10	71.4	2	14.3	1	7.1	-	-	1	7.2	14	100.0	9	64.3	1	7.1	3	21.5	1	7.1	-	-	14	100.0
41-45 years	22	64.7	4	11.8	1	2.9	1	2.9	6	17.7	34	100.0	21	61.8	8	23.5	1	2.9	1	2.9	3	8.9	34	100.0
46-50 years	13	59.1	1	4.5	1	4.5	1	4.5	6	27.4	22	100.0	11	50.0	2	9.1	-	-	1	4.5	8	36.4	22	100.0
51-55 years	11	61.2	3	16.7	-	-	1	5.6	3	16.7	18	100.0	8	44.4	5	27.8	1	5.6	2	11.1	2	11.1	18	100.0
56-60 years	12	75.0	2	12.5	1	6.2	-	-	1	6.2	16	100.0	11	68.7	1	6.2	2	12.5	1	6.2	1	6.2	16	100.0
61-65 years	6	100.0	-	-	-	-	-	-	-	-	6	100.0	6	100.0	-	-	-	-	-	-	-	-	6	100.0
66-70 years	2	66.7	-	-	-	-	-	-	1	33.3	3	100.0	1	33.3	1	33.3	-	-	-	-	1	33.3	3	100.0
71-75 years	3	100.0	-	-	-	-	-	-	-	-	3	100.0	3	100.0	-	-	-	-	-	-	-	-	3	100.0
General Total	85	68.0	15	12.0	4	3.2	3	2.4	18	14.4	125	100.0	76	60.8	19	15.2	8	6.4	7	5.6	15	12.0	125	100.0
(Pearson's Chi-Square = .970 / Cramer's V = .209)													(Pearson's Chi-Square = .022 / Cramer's V = .332)											
Profession																								
Farmer	2	66.7	1	33.3	-	-	-	-	-	-	3	100.0	2	66.7	-	-	1	33.3	-	-	-	-	3	100.0
Teacher	1	16.7	2	33.3	-	-	-	-	3	50.0	6	100.0	-	-	3	50.0	-	-	-	-	3	50.0	6	100.0
Personal servant	7	70.0	-	-	1	10.0	-	-	2	20.0	10	100.0	7	70.0	2	20.0	1	10.0	-	-	-	-	10	100.0
Civil servant	9	60.0	2	13.3	-	-	-	-	4	26.7	15	100.0	9	60.0	-	-	2	13.3	2	13.3	2	13.3	15	100.0
Religious leader	1	50	-	-	-	-	1	50	-	-	2	100.0	1	50.0	1	50.0	-	-	-	-	-	-	2	100.0
Entrepreneur	16	61.5	4	15.4	2	7.7	-	-	4	15.4	26	100.0	15	57.7	4	15.4	1	3.8	2	7.6	4	15.5	26	100.0
Labourer	14	82.4	1	5.9	-	-	-	-	2	11.7	17	100.0	9	53.0	3	17.6	2	11.8	1	5.9	2	11.7	17	100.0
Private sector worker	6	54.5	2	18.2	1	9.1	-	-	2	18.2	11	100.0	7	63.6	2	18.2	-	-	-	-	2	18.1	11	100.0
Unemployed	10	90.9	-	-	-	-	1	9.1	-	-	11	100.0	8	72.7	2	18.2	-	-	1	9.1	-	-	11	100.0
Retired	5	71.4	1	14.3	-	-	-	-	1	14.3	7	100.0	6	85.7	-	-	-	-	-	-	1	14.3	7	100.0
Other	14	82.3	2	11.8	-	-	1	5.9	-	-	17	100.0	12	70.5	2	11.8	1	5.9	1	5.9	1	5.9	17	100.0
General Total	85	68.0	15	12.0	4	3.2	4	3.2	18	14.4	125	100.0	76	60.8	19	15.2	8	6.4	7	5.6	15	12	125	100.0
(Pearson's Chi-Square = .056 / Cramer's V = .332)													(Pearson's Chi-Square = .477 / Cramer's V = .282)											

Table 8.3 Distribution of the Pyscho-Social Variables over the Dependent Variables (N=125).

Variable	Utilisation of Traditional Health Information & Communication Systems (THICS)												Utilisation of Modern Health Information & Communication Systems (MHICS)											
	Very low		Low		Average		High		Very high		Total		Very low		Low		Average		High		Very high		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Knowledge Level on Traditional Medicine																								
Very little	9	90.0	-	-	-	-	-	-	1	10.0	10	100.0	10	100.0	-	-	-	-	-	-	-	-	10	100.0
Little	33	80.5	6	14.7	1	2.4	-	-	1	2.4	41	100.0	30	73.2	6	14.6	2	4.9	1	2.4	2	4.9	41	100.0
Average	27	64.3	7	16.7	1	2.3	-	-	7	16.7	42	100.0	25	59.5	7	16.7	3	7.1	1	2.4	6	14.3	42	100.0
Much	14	51.9	2	7.4	1	3.7	1	3.7	9	33.3	27	100.0	10	37.1	5	18.5	2	7.4	4	14.8	6	22.2	27	100.0
Very much	2	40.0	-	-	1	20.0	1	20.0	1	20.0	5	100.0	1	20.0	1	20.0	1	20.0	1	20.0	1	20.0	5	100.0
General Total	85	68.0	15	12.0	4	3.2	3	2.4	18	14.4	125	100.0	76	60.8	19	15.2	8	6.4	7	5.6	15	12.0	125	100.0
(Pearson's Chi-Square = .004 / Cramer V's = .265)													(Pearson's Chi-Square = .064 / Cramer's V = .225)											
Knowledge Level on Modern Medicine																								
Very little	19	76.0	3	12.0	-	-	1	4.0	2	8.0	25	100.0	19	76.0	4	16.0	1	4.0	-	-	1	4.0	25	100.0
Little	28	80.0	3	8.6	3	8.6	-	-	1	2.8	35	100.0	23	65.8	6	17.1	2	5.7	2	5.7	2	5.7	35	100.0
Average	35	68.7	7	13.7	-	-	2	3.9	7	13.7	51	100.0	31	60.8	7	13.7	3	5.9	5	9.8	5	9.8	51	100.0
Much	2	33.3	1	16.7	1	16.7	-	-	2	33.3	6	100.0	3	50.0	1	16.7	1	16.7	-	-	1	16.6	6	100.0
Very much	1	12.5	1	12.5	-	-	-	-	6	75.0	8	100.0	-	-	1	12.5	1	12.5	-	-	6	75.0	8	100.0
General Total	85	68.0	15	12.0	4	3.2	3	2.4	18	14.4	125	100.0	76	60.8	19	15.2	8	6.4	7	5.6	15	12.0	125	100.0
(Pearson's Chi-Square = .000 / Cramer's V = .209)													(Pearson's Chi-Square = .001 / Cramer's V = .287)											
Knowledge of Availability of Libraries																								
Very little awareness	30	81.1	2	5.4	1	2.7	-	-	4	10.8	37	100.0	28	75.7	3	8.1	3	8.1	2	5.4	1	2.7	37	100.0
Little awareness	35	66.0	6	11.3	2	3.8	3	5.7	7	13.2	53	100.0	31	58.5	8	15.1	3	5.7	4	7.5	7	13.2	53	100.0
Average awareness	9	53.0	4	23.5	-	-	-	-	4	23.5	17	100.0	9	52.9	3	17.7	1	5.9	-	-	4	23.5	17	100.0
Much awareness	11	68.7	3	18.7	1	6.3	-	-	1	6.3	16	100.0	8	50.0	5	31.2	1	6.2	1	6.2	1	6.2	16	100.0
Very much awareness	-	-	-	-	-	-	-	-	2	100.0	2	100.0	-	-	-	-	-	-	-	-	2	100.0	2	100.0
General Total	85	68.0	15	12.0	4	3.2	3	2.4	18	14.4	125	100.0	76	60.8	19	15.2	8	6.4	7	5.6	15	12.0	125	100.0
(Pearson's Chi-Square = .079 / Cramer's V = .221)													(Pearson's Chi-Square = .040 / Cramer's V = .233)											
Belief in Power of the Printed Word																								
Low belief	9	64.4	1	7.1	1	7.1	1	7.1	2	14.3	14	100.0	12	85.7	-	-	2	14.3	-	-	-	-	14	100.0
Average belief	10	71.4	2	14.3	-	-	-	-	2	14.3	14	100.0	10	71.4	1	7.1	1	7.1	2	14.4	-	-	14	100.0
Strong belief	66	68.0	12	12.4	3	3.1	2	2.1	14	14.4	97	100.0	54	55.8	18	18.5	5	5.1	5	5.1	15	15.5	97	100.0
General Total	85	68.0	15	12.0	4	3.2	3	2.4	18	14.4	125	100.0	76	60.8	19	15.2	8	6.4	7	5.6	15	12	125	100.0
(Pearson's Chi-Square = .919 / Cramer V = .114)													(Pearson's Chi-Square = .077 / Cramer V's = .238)											

Table 8.4 Distribution of the Enabling Variables over the Dependent Variables (N=125).

Variable	Utilisation of Traditional Health Information & Communication Systems (THICS)												Utilisation of Modern Health Information & Communication Systems (MHICS)											
	Very low		Low		Average		High		Very high		Total		Very low		Low		Average		High		Very high		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Socio-Economic Status (SES)																								
Poor	50	75.8	8	12.1	2	3.0	1	1.5	5	7.6	66	100.0	45	68.2	9	13.6	5	7.6	4	6.1	3	4.5	66	100.0
Average	24	64.9	4	10.8	2	5.4	2	5.4	5	13.5	37	100.0	24	64.9	7	18.9	2	5.4	1	2.7	3	8.1	37	100.0
Well-to-do	11	50.0	3	13.6	-	-	-	-	8	36.4	22	100.0	7	31.8	3	13.6	1	4.6	2	9.1	9	40.9	22	100.0
General Total	85	68.0	15	12.0	4	3.2	3	2.4	18	14.4	125	100.0	76	60.8	19	15.2	8	6.4	7	5.6	15	12.0	125	100.0
(Pearson's Chi-Square = .065 / Cramer's V = .243)													(Pearson's Chi-Square = .022 / Cramer's V = .313)											

Table 8.5 Distribution of the Perceived Need of Health Information Variables over the Dependent Variables (N=125).

Variable	Utilisation of Traditional Health Information & Communication Systems (THICS)												Utilisation of Modern Health Information & Communication Systems (MHICS)											
	Very low		Low		Average		High		Very high		Total		Very low		Low		Average		High		Very high		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Need Modern Health Information																								
Low perceived need	8	100.0	-	-	-	-	-	-	-	-	8	100.0	4	50.0	3	37.5	-	-	1	12.5	-	-	8	100.0
Medium perceived need	77	68.7	15	13.4	4	3.6	3	2.7	13	11.6	112	100.0	72	64.3	16	14.3	8	7.1	6	5.4	10	8.9	112	100.0
High perceived need	-	-	-	-	-	-	-	-	5	100.0	5	100.0	-	-	-	-	-	-	-	-	5	100.0	5	100.0
General Total	85	68.0	15	12.0	4	3.2	3	2.4	18	14.4	125	100.0	76	60.8	19	15.2	8	6.4	7	5.6	15	12.0	125	100.0
(Pearson's Chi-Square = .000 / Cramer's V = .371)													(Pearson's Chi-Square = .000 / Cramer's V = .414)											

Table 8.6 Distribution of the Institutional Variables over the Dependent Variables (N=125).

Variable	Utilisation of Traditional Health Information & Communication Systems (THICS)												Utilisation of Modern Health Information & Communication Systems (MHICS)											
	Very low		Low		Average		High		Very high		Total		Very low		Low		Average		High		Very high		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Member Health Information Institution																								
Very few	51	71.8	8	11.3	2	2.8	1	1.4	9	12.7	71	100.0	44	62.0	12	16.9	4	5.6	4	5.6	7	9.9	71	100.0
Few	16	61.5	7	26.9	-	-	1	3.8	2	7.7	26	100.0	18	69.2	3	11.5	3	11.5	-	-	2	7.7	26	100.0
Average	11	64.7	-	-	1	5.9	1	5.9	4	23.5	17	100.0	10	58.8	2	11.8	1	5.9	1	5.9	3	17.6	17	100.0
Many	6	66.7	-	-	-	-	-	-	3	33.3	9	100.0	3	33.3	1	11.1	-	-	2	22.2	3	33.3	9	100.0
Very many	1	50.0	-	-	-	-	1	50.0	-	-	2	100.0	1	50.0	1	50.0	-	-	-	-	-	-	2	100.0
General Total	85	68.0	15	12.0	2	1.6	3	2.4	18	14.4	125	100.0	76	60.8	19	15.2	8	6.4	7	5.6	15	12.0	125	100.0
(Pearson's Chi-Square = .018 / Cramer's V = .245)													(Pearson's Chi-Square = .431 / Cramer's V = .181)											

Table 8.7 Distribution of the Intervening Variables over the Dependent Variables (N=125).

Variable	Utilisation of Traditional Health Information &Communication Systems (THICS)												Utilisation of Modern Health Information & Communication Systems (MHICS)											
	Very low		Low		Average		High		Very high		Total		Very low		Low		Average		High		Very high		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Exposure to Electronic Media																								
Very low exposure	7	70.0	1	10.0	1	10.0	1	10.0	-	-	10	100.0	8	80.0	1	10.0	1	10.0	-	-	-	-	10	100.0
Low exposure	48	78.7	6	9.8	2	3.3	-	-	5	8.2	61	100.0	42	68.8	8	13.1	2	3.3	5	8.2	4	6.6	61	100.0
Average exposure	13	68.4	4	21.0	-	-	1	5.3	1	5.3	19	100.0	12	63.1	5	26.3	-	-	1	5.3	1	5.3	19	100.0
High exposure	14	63.7	1	4.5	1	4.5	1	4.5	5	22.8	22	100.0	12	54.6	4	18.2	2	9.1	1	4.5	3	13.6	22	100.0
Very high exposure	3	23.1	3	23.1	-	-	-	-	7	53.8	13	100.0	2	15.4	1	7.7	3	23.1	-	-	7	53.8	13	100.0
General Total	85	68.0	15	12.0	4	3.2	3	2.4	18	14.4	125	100.0	76	60.8	19	15.2	8	6.4	7	5.6	15	12.0	125	100.0
(Pearson's Chi-Square = .003 / Cramer's V = .268)													(Pearson's Chi-Square = .001 / Cramer's V = .287)											
Exposure to Printed Media																								
Very low exposure	68	75.6	9	10.0	2	2.2	3	3.3	8	8.9	90	100.0	61	67.7	12	13.3	5	5.6	6	6.7	6	6.7	90	100.0
Low exposure	5	71.4	1	14.3	1	14.3	-	-	-	-	7	100.0	4	57.1	2	28.6	1	14.3	-	-	-	-	7	100.0
Average exposure	8	53.3	3	20.0	1	6.7	-	-	3	20.0	15	100.0	6	40.0	5	33.3	1	6.7	1	6.7	2	13.3	15	100.0
High exposure	2	50.0	-	-	-	-	-	-	2	50.0	4	100.0	2	50.0	-	-	-	-	-	-	2	50.0	4	100.0
Very high exposure	2	22.2	2	22.2	-	-	-	-	5	55.6	9	100.0	3	33.3	-	-	1	11.1	-	-	5	55.7	9	100.0
General Total	85	68.0	15	12.0	4	3.2	3	2.4	18	14.4	125	100.0	76	60.8	19	15.2	8	6.4	7	5.6	15	12.0	125	100.0
(Pearson's Chi-Square = .024 / Cramer's V = .241)													(Pearson's Chi-Square = .005 / Cramer's V = .261)											
Awareness of Epidemics																								
No	39	57.4	8	11.8	3	4.4	3	4.4	15	22.0	68	100.0	32	47.1	12	17.6	6	8.8	7	10.3	11	16.2	68	100.0
Yes	46	80.7	7	12.3	1	1.8	-	-	3	5.3	57	100.0	44	77.2	7	12.3	2	3.5	-	-	4	7.0	57	100.0
General Total	85	68.0	15	12.0	4	3.2	3	2.4	18	14.4	125	100.0	76	60.8	19	15.2	8	6.4	7	5.6	15	12.0	125	100.0
(Pearson's Chi-Square = .019 / Cramer's V = .307)													(Pearson's Chi-Square = .006 / Cramer's V = .342)											

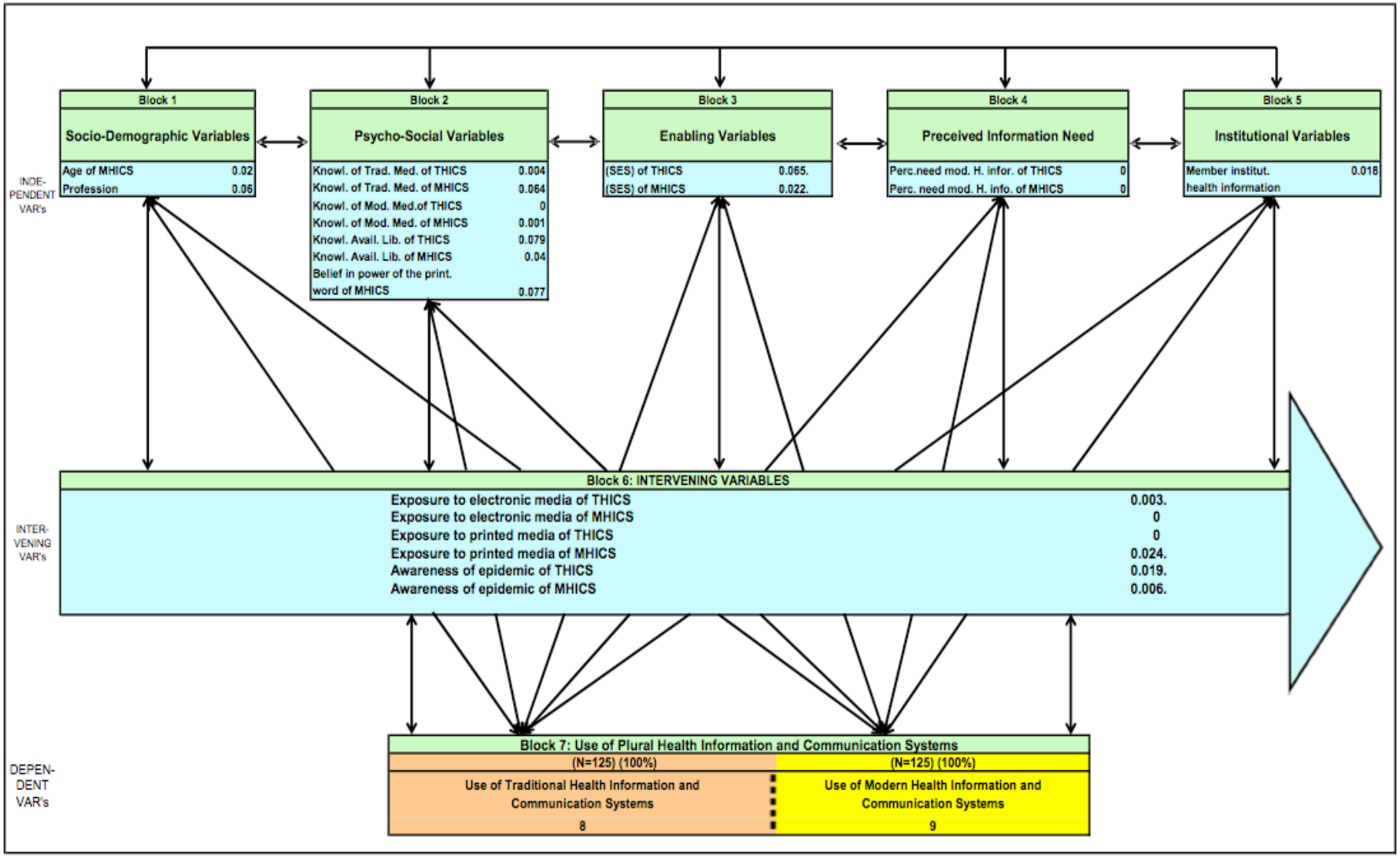

Figure 8.1 Model of the Mutual Relations Analysis with the Blocks of Significant Factors (20) in Sukamiskin. (Adapted from Slikkerveer 2012).

8.4 Multivariate Analysis: OVERALS

8.4.1 OVERALS: Nonlinear Canonical Correlation Analysis

The bivariate analysis which has been applied as the first step to the data collected from the household surveys and presented in the form of cross-tabulations, provides a first impression of the nature of the correlations between the predisposing, enabling and intervening variables on the one hand, and the dependent variables of utilisation of the Plural Health Information & Communication System (PHICS) on the other hand. On the basis of the analytical model selected for this study which has been adapted from the model of transcultural health care utilisation behaviour developed by Slikkerveer (1990; 2001) during his research carried out in the Horn of Africa, an advanced multivariate analysis, more specifically a Non-linear Canonical Correlation Analysis using the technique of OVERALS, is carried out as the second step in the analysis of the present data.

As an extension to the bivariate techniques of statistical data analysis, a multivariate analysis is applied to the present data in order to further analyse the different determinants of the respondents' behaviour while focusing on the interrelationships and interactions between all variables identified in the analytical model. The OVERALS programme allows variables to be measured at the nominal, ordinal and interval level whereby stability of the results can be obtained by using the Bootstrap method (*cf.* Burg & De Leeuw 1988). Furthermore, OVERALS selects weights for each set of variables in a way to maximise the canonical correlation between variables through the provision of so-called 'canonical variates' for each set of variables. This method can be regarded as a factor analysis of two sets of categories of variables, in which the variable from the first set should have a maximum correlation with the variable from the second set. The statistical technique also calculates the eigenvalue for each dimension whereby the concept of 'dimension' refers to a specific number of possible combinations of variables within each set. The canonical correlations coefficients and the eigenvalues are generally very stable provided that the sample size is not too small. As Aiglsperger (2014: 255) mentions: '*In addition to assessing the correlation between sets of variables, OVERALS evaluates the correlations between the canonical variates and the original variables which are known as 'canonical' or 'component loadings''*

Van Burgh, Noordenmeer & De Haes (1944) underscore that the confidence intervals for component loadings are larger than for eigenvalues but are nevertheless stable. The results of the multivariate analysis which is carried out on the basis of the OVERALS technique usually focuses on a description of the canonical correlation coefficients and the component loadings. The results of the canonical correlation analysis applied to the present data are presented in the form of component loadings of the two sets of independent and dependent variables for which two dimensions are chosen. The OVERALS analysis produces a list of 23 variables including their scaling level and offers the component loading of each variable on each dimension (*cf.* Table 8.8).

In order to present the OVERALS solution graphically, the component loadings are projected onto the canonical space, resulting in a plot which indicates the category of quantifications and the category of coordinates (*cf.* Figure 8.2).

The variables are labelled and operationalised as follows:

Set of Independent and Intervening Variabes
Predisposing Socio-Demographic Variables: 'HHsize', 'Age', 'EduForm', 'Prof';
Predisposing Psycho-Social Variables: 'KnowTHI', 'KnowMHI', 'KnowLib', 'BeliefTHI', 'BeliefMHI', 'BeliefPW', 'OpQualHI', 'OpCostHI', 'OpServHI';
Enabling Variables: 'SES';
Perceived Need of Health Information Variables: 'NeedTHI', 'NeedMHI';
Institutional Variables: 'ExpoHI', 'MemInst';
Intervening Variables: 'ExpoElec', 'ExpoPrint', 'Epidemics';

The component loadings presented in Table 8.8 indicate that the variables 'ExpoElec' (-0.570), 'NeedMHI' (-0.560) and 'KnowMHI' (-0.559) have a large effect on Dimension 1. As shown in Figure 8.2, a significantly high correlation appears to exist between the intervening variable 'Exposure to Electronic Media' in Set 1 and the dependent variable 'Utilisation of Modern Health Information & Communication Systems' in Set 2.

Table 8.8 Component Loadings of the two Sets of Variables with a Total of 23 Variables on two Dimensions (N=125).

Set	Variable	Dimension 1	Dimension 2
1	HHsize (a, b)	0.089	0.200
	Age (b, c)	0.085	0.303
	EduForm (b, c)	-0.209	0.170
	Prof (b, d)	-0.045	-0.324
	KnowTHI (b, c)	-0.458	-0.038
	KnowMHI (b, c)	-0.559	0.142
	KnowLib (b, c)	-0.140	0.077
	BeliefTHI (b, c)	-0.018	0.157
	BeliefMHI (b, c)	-0.044	-0.157
	BeliefPW (b, c)	-0.046	-0.153
	OpQualHI (b, c)	-0.203	-0.168
	OpCostHI (b, c)	-0.158	-0.086
	OpServHI (b, c)	0.065	-0.306
	SES (b, c)	-0.414	-0.095
	NeedTHI (b, c)	-0.187	0.161
	NeedMHI (b, c)	-0.560	0.134
	ExpoHI (b, c)	-0.023	0.051
	MemInst (b, c)	-0.167	-0.108
	ExpoElec (b, c)	-0.570	-0.026
	ExpoPrint (b, c)	-0.468	0.127
	Epidemics (b, d)	0.403	-0.009
2	UseTHI (b, c)	-0.812	0.457
	UseMHI (b, c)	-0.846	-0.394

a = Optimal Scaling Level: Numerical
b = Projections of the Single Quantified Variables in the Object Space
c = Optimal Scaling Level: Ordinal
d = Optimal Scaling Level: Single Nominal

On the second dimension, the variables 'Prof' (-0.324), 'OpServHI' (-0.306) and 'Age' (0.303) have a medium effect. Similarly, the variable 'Opinion on the Service of Health Information' in Set 1 tends to correlate with the dependent variable 'Use of Modern Health Information & Communication Systems' in Set 2 (*cf.* Figure 8.2). The strongest component loadings are, however, found among the dependent variables which indicate a strong correlation between the dependent variables as well as between both sets of variables.

The largest effect is produced by the variable 'UtilisationMHI' on the first dimension (-0.846) followed by 'UtilisationTHI' on the first dimension (-0.812). On the second dimension, the variables have a medium effect of 0.457 for 'UtilisationTHI' and -0.394 for 'UtilisationMHI'. With the exception of the variable 'OpServHI', the results of the multivariate analysis support the findings of the bivariate analysis, particularly with regard to the variables 'ExpoElec', 'NeedMHI' and 'KnowMHI'.

8.4.2 Projection of Variables and Objects in the Canonical Space

Figure 8.1 presents a graphical impression of all 23 variables as points in the canonical space which hereby helps to gain a better understanding of the complex coherence among the variables.

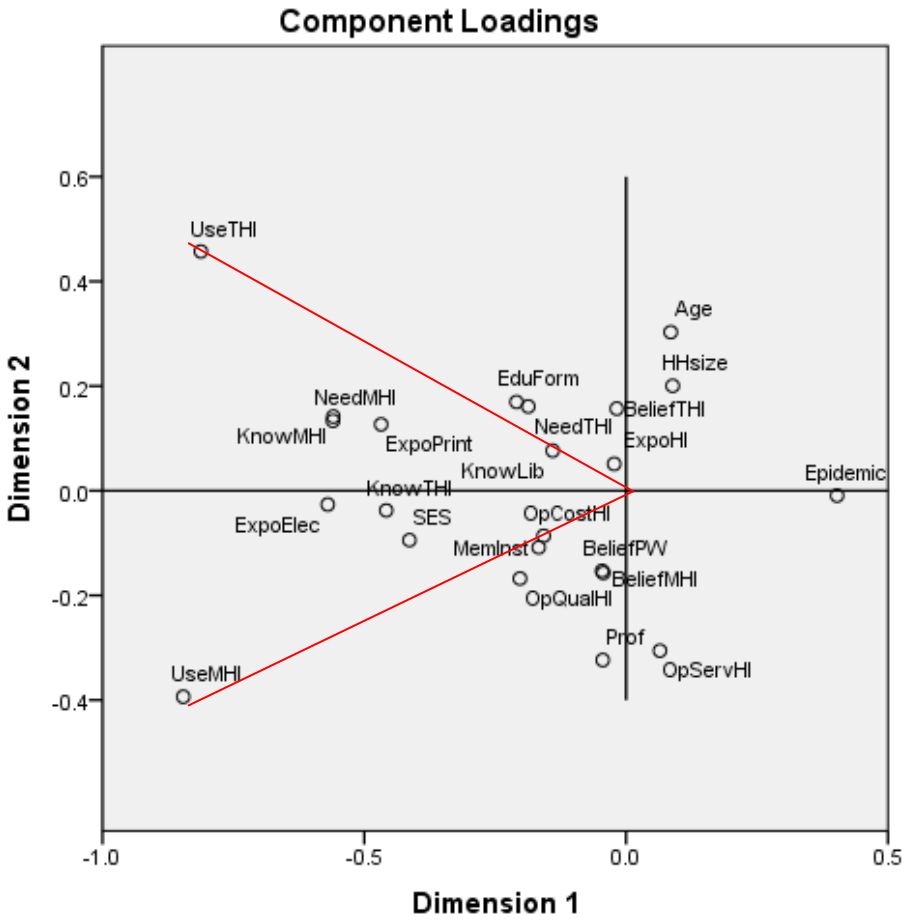

Figure 8.2 Graphic Representation of the Projection of Component Loadings of the two Sets of Variables onto the Canonical Space with a Total of 23 Variables on two Dimensions (N= 125).

In addition, Figure 8.3 shows the scatter plot for all 23 optimally scaled variables and highlights the divergence between the dependent variables 'Utilisation of Traditional Health Information & Communication Systems' and 'Utilisation of Modern Health Information & Communication Systems'. The dependent variables have been projected in the canonical space in relation to 21 predictor variables (*cf.* Ambaretnani 2012).

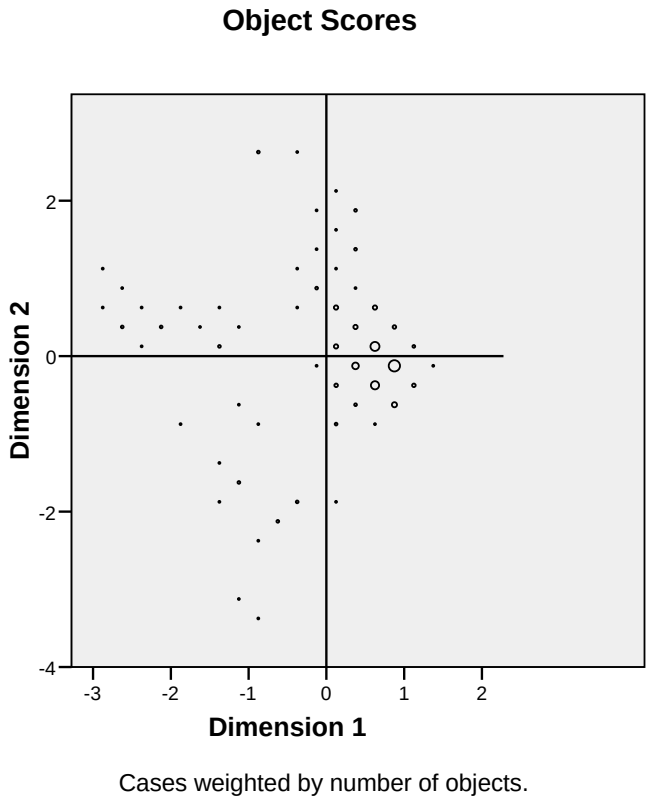

Figure 8.3 Projection of 23 optimally scaled Variables from Set 1 and Set 2 in Canonical Space.

8.5 The Analytical Model: Multiple Regression Analysis

8.5.1 Calculation of Correlation Coefficients

For the purpose of this study, the OVERALS technique is used to assess not only the correlation between variables, but also the correlation between the different blocks of variables identified in the model, *i.e.* the interaction between the blocks of independent, intervening and dependent variables.

Table 8.9 Calculated Multiple Correlation Coefficients (r) of Eight Blocks of Factors on two Dimensions (N=125)

Block ←→ Block	Dimension	Calculation[a]	Multiple Correlation Coefficient (r)
1 ←→ 2	1	2 x 0.890 – 1 =	0.780
	2	2 x 0.808 – 1 =	0.616
1 ←→ 3	1	2 x 0.758 – 1 =	0.512
1 ←→ 4	1	2 x 0.794 – 1 =	0.588
	2	2 x 0.681 – 1 =	0.316
1 ←→ 5	1	2 x 0.753 – 1 =	0.506
	2	2 x 0.645 – 1 =	0.290
1 ←→ 6	1	2 x 0.783 – 1 =	0.506
	2	2 x 0.705 – 1 =	0.410
1 ←→ 7	1	2 x 0.721 – 1 =	0.442
1 ←→ 8	1	2 x 0.737 – 1 =	0.474
2 ←→ 3	1	2 x 0.767– 1 =	0.534
2 ←→ 4	1	2 x 0.778 – 1 =	0.556
	2	2 x 0.711 – 1 =	0.422
2 ←→ 5	1	2 x 0.896 – 1 =	0.792
	2	2 x 0.825 – 1 =	0.650
2 ←→ 6	1	2 x 0.897 – 1 =	0.794
2 ←→ 7	1	2 x 0.821 – 1 =	0.642
2 ←→ 8	1	2 x 0.809 – 1 =	0.618
3 ←→ 4	1	2 x 0.723 – 1 =	0.446
3 ←→ 5	1	2 x 0.625 – 1 =	0.250
3 ←→ 6	1	2 x 0.688 – 1 =	0.376
3 ←→ 7	1	2 x 0.640 – 1 =	0.128
3 ←→ 8	1	2 x 0.700 – 1 =	0.400
4 ←→ 5	1	2 x 0.743 – 1 =	0.486
4 ←→ 6	1	2 x 0.824 – 1 =	0.648
4 ←→ 7	1	2 x 0.758 – 1 =	0.516
4 ←→ 8	1	2 x 0.637 – 1 =	0.274
5 ←→ 6	1	2 x 0.677 – 1 =	0.354
5 ←→ 7	1	2 x 0.618 – 1 =	0.236
5 ←→ 8	1	2 x 0.637 – 1 =	0.274
6 ←→ 7	1	2 x 0.762 – 1 =	0.524
6 ←→ 8	1	2 x 0.772 – 1 =	0.544

[a]The values in the calculation are the eigenvalues for the first and second dimension.

Following the OVERALS analysis of each block of variables, the relationships between the different blocks of variables which highlights the explanatory value of the analytical model towards predicting people's utilisation behaviour is addressed by means of a multiple regression analysis, as it includes an assessment of the interactions between all 23 variables in the two data sets, grouped in the related categories or blocks in the model.

In this way, nonlinear canonical correlation analysis is suitable for determining the coherence between categories of independent and intervening variables as well as dependent variables, thus for interpreting the coherence of the final explanatory model of the respondents' utilisation of the Traditional and Modern Health Information & Communication Systems (T&MHICS).

The multiple regression analysis estimates the significance of the final model of utilisation behaviour by means of analysing the association between the different blocks of factors which is expressed by a multiple correlation coefficient (r). For this research, the multiple correlation coefficients are calculated on the basis of the eigenvalue which OVERALS produces for each dimension (Ed), and by subsequently applying the formula 'rd= 2 x Ed – 1' (*cf.* Agung 2005, Ibui 2007, Leurs 2010, Djen Amar 2010, Ambaretnani 2012, Aiglsperger 2014). Table 8.9 shows the multiple correlation coefficients (r) which are calculated for all possible correlations between the different blocks of variables in the model.

As regards Table 8.9, the strongest correlation is found between Block 2 of the predisposing psycho-social variables and Block 6 of the intervening variables (r1 = 0.794), as well as between Block 2 of the predisposing psycho-social variables and Block 5 of the institutional variables (rl = .792, r2 = .650). The results moreover reveal a strong correlation between Block 1 of the predisposing socio-demographic variables and Block 2 of the predisposing psycho-social variables (rl = .780, r2 = .616).

The strongest correlations with the dependent variables are found between Block 2 of the predisposing psycho-social variables and Block 7 of the utilisation variables of the Traditional Health Information & Communication System (THICS) (r1 = 0.642) as well as between Block 2 of the predisposing psycho-social variables and Block 8 of the utilisation variables of the Modern Health Information & Communication System (MHICS) (r1 = 0.618). Strong correlations moreover exist between Block 6 of the intervening variables and Block 8 of the utilisation variables of the MHICS (r1 = 0.544), between Block 6 of the intervening variables and Block 7 of the utilisation variables of THICS (r1 = 0.524), as well as between Block 4 of the perceived need of health information variables and Block 7 of the utilisation variables of THICS (r1 = 0.516).

8.5.2 The Final Model of Utilisation of the Plural Health Information & Communication System (PHICS)

On the basis of the results gained from the multiple regression analysis, Figure 8.4 shows the final model of patterns of utilisation of the plural health information & communication system displayed by the research participants in Sukamiskin. The correlations (r) between the blocks of independent, intervening and dependent variables which have been calculated by means of multiple regression analysis are presented. These correlations show the relative value of interaction between the blocks and hereby highlight the validity of the multivariate model.

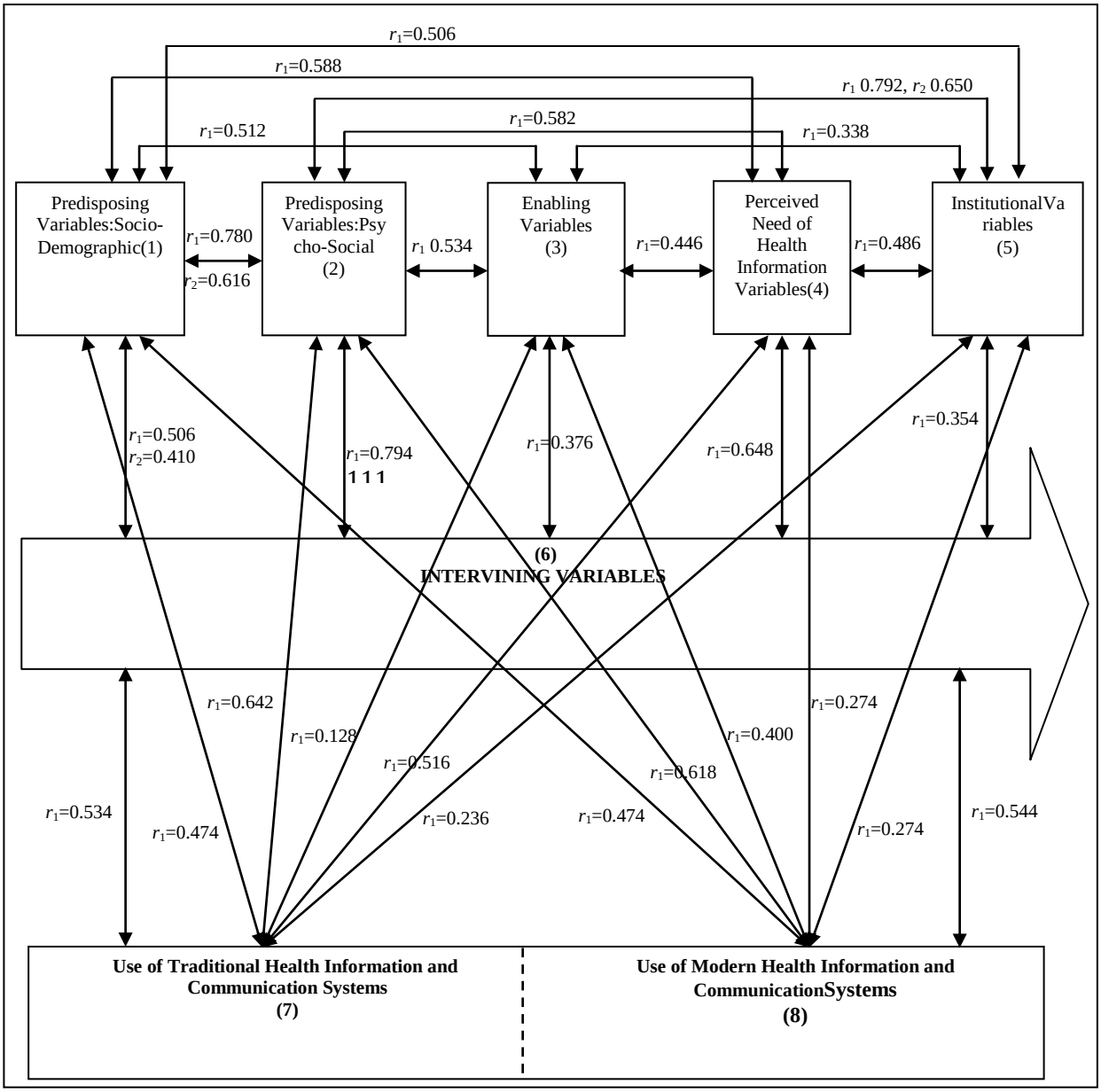

Figure 8.4 The Final Model of Utilisation of the Plural Health Information & Communication System (PHICS), indicating the Multiple Correlation Coefficients.

8.6 Interpretation of Results

As indicated in Paragraph 8.2, the average pattern of utilisation of the Traditional Health Information & Communication System (THICS) shows scores of 85 (68.0%); 15 (12.0%); 4 (3.2%); 3 (2.4%) and 18 (14.%), distributed over respectively 'Very low'; 'Low'; Average; 'High' and 'Very high' utilisation, and the Modern Health Information & Communication System' (MHICS) with scores of 76 (60.8%); 19 (15.2%); 8 (6.4%); 7 (5.6%) and 15 (12.0%), distributed over respectively 'Very low'; 'Low'; Average; 'High' and 'Very high' utilisation.

Here, the results of the bivariate analysis are showing that a number of significant correlations exist between the independent and intervening variables in relation to the dependent variables (*cf.* Tables 8.1, 8.2, 8.3, 8.4, 8.5 and 8.6). The related significant correlations can be interpreted as follows:

Independent variables:

Socio-demographic variables

The bivariate analysis illustrates that the socio-demographic variables 'Age' and 'Profession' correlate with different values of significance with the dependent variables.

The *strongly significant* correlation with the variable 'Age' emerging in the very high utilisation of the Modern Health Information & Communication System' (MHICS) is largely determined by less than two-thirds (68.7%, n=11) of respondents in the category of **'**Age' between 56-60 years' of age. This score indicates that most of the elderly in the community are hardly utilising the MHICS, largely due to their limited access to the modern media.

The *weakly significant* correlation with the variable 'Profession' emerging in the very low utilisation of the Traditional Health Information & Communication System' (THICS) is largely determined by over four-fifths (90.9%, n=10) of the respondents in the category of the **'**Unemployed'. This score indicates that the unemployed in the community are hardly utilising THICS.

Psycho-social variables

The bivariate analysis also illustrates that the independent variables 'Knowledge Level on Traditional Medicine', 'Knowledge Level on Modern Medicine', 'Knowledge of Availability of Libraries' and 'Belief in Power of the Printed Word' correlate significantly with the dependent variables.

The *strongly significant* correlation with the 'Knowledge Level on Traditional Medicine' emerging in the very low utilisation of the Traditional Health Information & Communication System (THICS) is largely determined by over four-fifths (90.0%. n= 9) of the respondents in the category with 'Very little knowledge of traditional medicine'. This score indicates that the respondents with very little knowledge of traditional medicine are hardly utilising THICS.

The *weakly significant* correlation with the variable 'Knowledge Level on Traditional Medicine' emerging in the very low utilisation of the Modern Health Information & Communication System' (MHICS) is largely determined by virtually all (100.0%, n=10) of the respondents in the category with 'Very little knowledge of traditional medicine'. This score indicates that respondents with very little knowledge of traditional medicine are not utilising MHICS.

The *most strongly significant* correlation with the variable 'Knowledge Level on Modern Medicine' emerging in the very low utilisation of the Traditional Health Information & Communication System' (THICS) is also largely determined by four-fifths (80%, n=28) of the respondents in the category with 'Very little knowledge of modern medicine'. This score indicates that the respondents with very little knowledge of modern medicine are hardly utilising THICS.

Similarly, the *very significant* correlation with the variable 'Knowledge Level on Modern Medicine' emerging in the very low utilisation of the Modern Health Information & Communication System' (MHICS) is largely determined by three-quarters (76.0%, n=19) of the respondents in the category with 'Very little knowledge of modern medicine'. This score indicates that respondents with very little knowledge of modern medicine are hardly utilising MHICS.

The *weakly significant* correlation with the variable 'Knowledge of the Availability of Libraries' emerging in the very low utilisation of the Traditional Health Information & Communication System (THICS) is largely determined by two-thirds 75.0%. n=35) of the respondents in the category with 'Little knowledge of available libraries'. This score indicates that more than half of these are not utilising THICS.

In contrast, the *strongly significant* correlation with the variable 'Knowledge of Availability of Libraries' emerging in the very low utilisation of the Traditional Health Information & Communication System (THICS) is largely determined by more than three-fourths of the respondents (75.0%, n= 6) in the category of respondents with 'Little knowledge of available libraries'. This score indicates that those respondents with very much knowledge of the availability of libraries are very much utilising the Modern Health Information & Communication System (MHICS). These results are supported by the findings of the canonical correlation analysis which reveal that the predisposing psycho-social variables in fact determine patterns of utilisation of traditional and modern health information & communication systems. Throughout the research area, knowlegde of traditional and modern medicine is primarily transferred by means of traditional communication from generation to generation (*cf.* Chapter 6). However, nowadays, traditional health information can also be easily obtained from various modern sources of health information in printed or recorded form and is hereby available *i.a.* at libraries, on the Internet or in television programmes.

The *weakly significant* correlation with the variable 'Belief in Power in the Printed Word' emerging in the very low utilisation of the Modern Health Information & Communication System (MHICS) is largely determined by more than four-fifths (85.7%, n=12) of the respondents in the category with a 'Low belief in the power of the printed word'. This score indicates that the respondents with a low belief in the power of the printed word are hardly utilising MHICS.

The above-mentioned results are also supported by the findings of the canonical correlation analysis which reveal that the predisposing psycho-social variables not only determine but also dominate the patterns of utilisation of both the Traditional and Modern Health Information & Communication Systems (T&MHICS), together forming the Plural Health Information & Communication Systems (PHICS). Throughout the research area, knowlegde of traditional and modern medicine is primarily transferred by means of traditional communication from generation to generation (*cf.* Chapter 6). Nowadays, traditional health information can also easily be obtained from various modern sources of health information in printed or recorded form and is hereby available *i.a.* at libraries, on the Internet or in television programmes.

Enabling Variables

The bivariate analysis also shows that the variable 'Socio-Economic Status' (SES)' correlates significantly with the dependent variable of the Traditional Health Information & Communication System (THICS) and is strongly significant with the dependent variable of the Modern Health Information & Communication System (MHICS).

The *weakly significant* correlation with the variable 'Socio-Economic Status (SES)' emerging in the very low utilisation of the Traditional Health Information & Communication System (THICS) is largely determined by two-thirds (75.8%, n= 50) of the respondents in the category with a 'Poor Socio-Economic Status (SES)'. This score indicates that respondents with a poor socio-economic status are hardly utilising THICS. These results support the limited access of the poor to a number of sources of health information, such as the Internet which involves operating costs, for example, for the use of a computer or a smartphone.

Similarly, the *strongly significant* correlation with the variable 'Socio-Economic Status (SES)' emerging in the very low utilisation of the Modern Health Information & Communication System' (MHICS) is largely determined by over two-thirds (68.2%, n=45) of the respondents in the category with a 'Poor Socio-Economic Status (SES)'. This score indicates that the respondents with a poor socio-economic status (SES) are hardly utilising MHICS. The modern medical systems available in the research area are still considered expensive and sometimes less effective by the majority of community members. Furthermore, access to a number of sources of health information, such as the Internet, involves several operating costs, for example, for the use of a computer or a smartphone.

Perceived Need of Health Information Variables

The bivariate analysis also illustrates that the perceived need of health information variables most strongly correlate significantly with the dependent variables.

The *most strongly significant* correlation with the variable 'Need of Modern Health Information' emerging in the very low utilisation of the Traditional Health Information & Communication System (THICS) is largely determined by more than three-fourths of the respondents (68.7%, n=77) in the category with a 'Medium perceived need of modern health information'. This score indicates that respondents with a medium perceived need of modern health information are hardly utilising the THICS.

Similarly, the *most strongly significant* correlation with the variable 'Need of Modern Health Information' emerging in the very low utilisation of the Modern Health Information & Communication System (MHICS) is largely determined by less than three-fourths (64.3%, n= 72) of the respondents in the category with a 'Medium perceived need of modern health information'. This indicates that respondents with a medium perceived need of modern health information are hardly utilising MHICS.

Institutional Variables

The bivariate analysis also illustrates that the institutional variable 'Member Health Information Institution' srongly correlates significantly with the dependent variables of the Traditional Health Information & Communication System (THICS).

The *strongly significant* correlation with the variable 'Member Health Information Institution' emerging in the very low utilisation of the Traditional Health Information & Communication System (THICS) is largely determined by more than three-fourths (68.7%, n=77) of the respondents in the category with 'Very few memberships of institutional health information'. This indicates that respondents with very few memberships of institutional health information are hardly utilising THICS.

In addition, patterns of utilisation of traditional health information & communication reported by the household heads are to a certain extent influenced by those respondents who are related to institutional health information. On the contrary, exposure to institutional health information has no correlation with the reported utilisation of the Plural Health Information & Communication System.

Intervening Variables

The bivariate analysis also illustrates that the institutional variable 'Member Health Information Institution' correlates with different values of significance with the dependent variables.

The *very strongly significant* correlation with the variable 'Exposure to Electronic Media' emerging in the very low utilisation of the Traditional Health Information & Communication System (THICS) is largely determined by three-fourths (78.7%, n=48) of the respondents in the

category with ‘Low exposure to electronic media’. This indicates that more than half of the respondents with a low exposure to electronic media are hardly utilising THICS. Similarly, the *very strongly significant* correlation with the variable ‘Exposure to Electronic Media’ emerging in the very low utilisation of the Modern Health Information & Communication System (MHICS) is largely determined by more than two-thirds (68.8%, n=42) of the respondents in the category with a ‘Low exposure to electronic media’. This score indicates that respondents with a low exposure to electronic media are hardly utilising MHICS.

The *very strongly significant* correlation with the variable ‘Exposure to Printed Media’ emerging in the very low utilisation of the Traditional Health Information & Communication System (THICS) is largely determined by three-quarters (75.6 %, n=68) of the respondents in the category with ‘Very low exposure to printed media’. This score indicates that three-quarters of the respondents with a low exposure to printed media are hardly utilising THICS.

Similarly, the *very strongly significant* correlation with the variable ‘Exposure to Printed Media’ emerging in the very low utilisation of the Modern Health Information & Communication System (MHICS) is largely determined by less than two-thirds (67.7%, n=61) of the category of respondents with ‘Very low exposure to printed media’. This indicates that more than half of the respondents with a low exposure to printed media are hardly utilising the Traditional Health Information & Communication System (THICS).

The inhabitants of Sukamiskin are highly exposed to health information on a daily basis. The information is distributed by a number of media including television, newspapers, magazines, brochures, banners, ballyhoos and posters. The ‘Bandung TV’ station, for example, is located in Sukamiskin and runs a popular programme on health information. The vicinity of Bandung moreover facilitates access to the Internet and radio programmes for the community members. Health information in printed form, such as books and magazines is available in the community reading corners of the public libraries which are owned by the community.

The *strongly significant* correlation with the variable ‘Awareness of Epidemics’ emerging in the very low utilisation of the Traditional Health Information & Communication System (THICS) is largely determined by more than three-quarters (80.7%, n=46) of the respondents in the category with an ‘Awareness of Epidemics. This score indicates that much more than half of the respondents with an awareness of Epidemics are hardly utilising THICS.

Similarly, the *very strongly significant* correlation with the variable ‘Awareness of Epidemics’ emerging in the very low utilisation of the Modern Health Information & Communication System (MHICS) is largely determined by more than three-quarters (77.2%, n=44) of the respondents in the category with ‘Very low Awareness of Epidemics’. This indicates that the respondents *with* a low awareness of epidemics are hardly utilising MHICS. In general, the inhabitants of Dengue Fever and Avian Influenza, not least because of the information which is obtained from the media.

The Mutual Relations Analysis provides a clear overview of the different categories of significant variables in relation to the two distinct categories of the dependent variables.

The general distribution of levels of utilisation of the Traditional Health Information & Communication System (THICS), ranging between ‘Very low’, ‘Low’, ‘Average’, ‘High’ to ‘Very high’ over the various significant independent and intervening variables of the analysis amounts to respectively 68.0%, 12.0%, 3.2%, 2.4% and 14.4%., which indicates that there is, on the one hand, a generally **very low level of utilisation** by more than two-thirds (68.0%, n=85) of the rates reported, while on the other hand a generally **very high level of utilisation** of almost one-fifth (14.4%, n=18) of therates reported of THICS. This distribution justifies the overall interpretation that if the average proportion of utilisation of 3.2% (n=4) is taken as the center of the distribution, there is a net four-fifths (80%) of rates of very low to low utilisation reported,

while almost one-fifth (16.8%) of rates of very high to high utilisation are reported for THICS by the respondents in the research area. In other words, the balance of utilisation of THICS has clearly shifted towards its very low to low utilisation by the respondents.

Similarly, the general distribution of levels of utilisation of the Modern Health Information & Communication System (MHICS), ranging between 'Very low', 'Low', 'Average', 'High' and 'Very high' over the various significant independent and intervening variables of the analysis amounts to respectively 60.8%, 15.2%, 6.4%, 5.6% and 12.0%., indicating that there is, on the one hand, a generally **very low level of utilisation** of more than half (60.8%, n=76) of the rates reported, while on the other hand, a generally very **high level of utilisation** of more than one-tenth (12.0%, n=15) of the rates is reported for MHICS. This distribution justifies the overall interpretation that if the average proportion of utilisation of 6.4% (n=8) is taken as the center of the distribution, there is a net rate of more than two-thirds (76%) of the rates of very low to low utilisation reported, while almost one-fifth (17.6%) of the rates of very high to high utilisation are reported for MHICS by the respondents in the research area.. In other words, the balance of utilisation of MHICS has clearly shifted towards its very low to low utilisation by the respondents.

In comparison, the Traditional Health Information & Communication System (THICS) is relatively more under-utilised than the Modern Health Information & Communication System (MHICS), with respectively a net rate of four-fifths (80%) of rates *versus* more than two-thirds (76%) of the rates reported by the respondents of the sample surveys. The implications of these findings will be presented in the next chapter (Chapter IX), with special attention for the development of a model of integration of traditional and modern systems of health information and communication**.**

Notes

[1] Pearson's Chi-Square test allows to determine whether or not there is a statistically significant association between two variables. The Chi-Square value provides a measure of the overall difference between the observed frequencies and the expected frequencies. The greater the overall difference, the larger the value of the Chi-Square and the more significant the relationship between variables (*cf.* Miller *et al*. 2002).

[2] In general, intervening variables influence the standard relationship between independent variables and dependent variables from the outside. In this research, the intervening variables refer to 'Exposure to Electronic Media', 'Exposure to Printed Media' and 'Awareness of Epidemics' of the respondents. Electronic media include television, radio and the Internet while printed media refer to newspapers, magazines and tabloids. Both electronic and printed media disseminate health information mostly in the form of news, columns, opinions, advertisements and publicity. The third intervening variable 'Awareness of Epidemics' addresses the awareness of each individual for health information on Epidemics. The variable relates to individuals who seek information on how to avoid being struck by an epidemic as well as to individuals who are already affected by an epidemic, and are thus searching for information appropriate to finding treatment.