Construction and Standardization of Lifestyle Inventory for Kerala

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Abstract

From the study conducted for the purpose of constructing a standardised questionnaire for measuring the Lifestyle pattern of the people Kerala a five-factor based Inventory was developed which is illustrated in the following table. It was also found that these factors can measure the lifestyle pattern of with high degree of validity and objectivity.

Key Words: Standardization- Inventory- expert appraisal mechanism- cognitive assessment- behavioural coding- respondent debriefing-vignettes-split sample experiments.

Introduction

Survey questionnaires are used to produce comparable and meaningful responses from respondents. Construction and standardization of questions and responses are inevitable part of this process. The main aim of this process is to elicit options and questions that are understood as intended by respondents and that purpose of the study. In the past these goals were not met in practice and standardised assessment tools were was rarely. Tools for providing feedback on survey questions have been introduced or refined, which includes expert appraisal mechanism, cognitive assessment, behavioural coding, respondent debriefing, vignettes, and split-sample experiments. Theoretical perspectives like sense of the

effects of question wording and context etc. are another advance is this area of study. New theory and pretesting tools provide a scientific basis for decisions about construction of survey questionnaires.

Lifestyle is associated with majority of health problems. Higher risk of disease results from lifestyle decisions and conditions such as physical inactivity; a poor diet, weight gain; consumption of alcohol; smoking; and stress. According to WHO figures the United States spends more per capita on health care than any other country in the world, yet the health care system ranks only thirty-seventh in the world. Now the American health care system has placed primary emphasis on prevention of Lifestyle Diseases and its management through active living, a shift from its earlier focus on treatment of disease.

Kerala USA shows striking similarity in the burden of deaths from hypokinetic diseases and related health problems. In the case of infectious diseases also the similarity exists, iebelow 5 percent of all deaths. The most striking difference is in cancer mortality. Though there is evidence that cancer incidence is increasing in India, currently, the burden remains low in rural Kerala. Data from Kerala confirmed the popular perception that heart attacks are on the increase. Ischemic heart disease (IHD) mortality in Kerala is nearly three times higher than that in France. Even the United States fares better than Kerala in IHD mortality. The differences in stroke mortality are not as striking. A matter of great concern is the poor state of mental health of the people of Kerala which is indicated by the high suicide rate. The suicide rate among women in Kerala is also higher than compared to male.

During the second half of the 20th century the mortality and fertility rate in Kerala has witnessed a dramatic decline but new problems due to the threat of hypokinetic diseases starts to grow up frighteningly. The occurrence of Type 2 diabetes, hypertension, over- weight and obesity, and cardio-vascular diseases has assumed alarming proportions. Quick changes in lifestyle and physical inactivity have contributed to an upsetting increase in lifestyle diseases or non-communicable syndromes. It is unfortunate to learn that the state of Kerala has not yet taken in seriously about the magnitude or the disaster consequences due to non-communicable diseases.

Fortunately, interventions wanted for controlling these are not expensive or much high technology oriented interventions are not required. Involvements like following a healthy life style, exercise management, active living and a diet management system can make a substantial dip in the problem of non-communicable diseases in Kerala.

Statement of the Problem

The study titled Construction and Standardization of Life-style Inventory for Kerala is arrived to develop a special wellness inventory package for the state of Kerala in the area of lifestyle, which is directly attributed to Health of an individual as well as society.

Delimitations

The study is delimited to the following areas.

1) The study is delimited to fourteen districts of the state of Kerala
2) The study is delimited to the age group of 35 to 45 both gender
3) The study is further delimited to socio-economic classes as per govt of kerala index laying in the Above Poverty Line (APL) in the Ration Card
4) The sample population selected for the questionnaire construction will be delimited to 1400 (N=1400), that is 100 randomly selected from 14 districts.

Limitations of the study

Since this inventory is general and educational in nature. It has some limitations.

1) It will not be able to take into account the completely family history of diseases that may exert a significant influence on ones future health.
2) It will not be able to look at personal health history completely.
3) The assessment will be made on the basis of filled up statement, which is subject to subject to the participants' credibility and honesty
4) Error of proximity - the tendency to rate items similarly because they are near to each other in the questionnaire.

Research Design

In order to test the proposed model it was necessary to utilize appropriate measures of the proposed constructs. To develop measures for the particular constructs, the research scholar followed the seven step stage frame work recommended by Churchill (1979). The seven stages include

Specifying the domain of the constructs

1) Generating sample items
2) Collecting data
3) Transitional Validity
4) Construct Validity

5)   Assessing reliability

6)   Final Draft

Lifestyle Questionnaire (LSQ)

Most people believe that they control their lifestyle. According to a survey, almost three fourths of people believe that if they eat right, do not smoke, and get regular checkups, they have good chance of preventing cancer. An even larger number, more than 80%, believed that they can significantly reduce their chances of having heart attack. So people are more likely to engage in preventive health behaviors, which are health practices that promote wellness and prevent or reduce morbidity and mortality. A self-help approach assumes that individuals can manage lifestyle changes and can learn to control those features in the environment that are detrimental to health. The first step in any lifestyle-change program is to evaluate personal health habits and practices. Fifteen items were administered by using a 4 point Likert scale ranging from 1 (Never) to 4 (Very often).

Proposed items for Lifestyle Questionnaire(LSQ)

Si No	Proposed items
LsQ1	Enjoy life in a rewarding manner
LsQ2	Health is controlled by heredity
LsQ3	My family has a lot to do with my becoming sick or staying healthy.
LsQ4	I believe that health is a matter of choice
LsQ5	Health professionals control my health
LsQ6	Exercise improves the quality of life
LsQ7	I am disappointed with my life now
LsQ8	I am ready to follow a health action plan
LsQ9	If I take right actions, I can stay healthy.
LsQ10	If I get sick, my behavior determines how soon I get well
LsQ11	I am not able to control my stress.
LsQ12	Health is decided by uncontrollable factors

LsQ13	I am ready to modify my behavior
LsQ14	I want to make some changes in my life

Factor Analysis of Lifestyle Questionnaire (LSQ)

The correlation matrix is used to check the pattern of relationships. First the significance values scanned and verified that there is no variable for which the majority of values are greater than 0.05. Then the correlation coefficients checked to find out any value is greater than 0.9. In the Lifestyle Questionnaire items, there were no variable with high correlation value. By verifying it is found that the multi-collinearity is not a problem for these data, all questions in the LSQ correlate fairly well and none of the correlation coefficients are particularly large; therefore, there is no need to consider eliminating any questions at this stage

Correlation Matrix

		LSQ1	LSQ2	LSQ3	LSQ4	LSQ5	LSQ6	LSQ7	LSQ8	LSQ9	LSQ10	LSQ11	LSQ12	LSQ13	LSQ14
Correlation	LSQ1	1.000	.209	.114	.299	.056	.260	.170	-.040	.051	.121	.056	.065	.181	.159
	LSQ2	.209	1.000	.267	.430	-.004	.149	.062	-.101	-.010	-.032	.088	.243	.098	.278
	LSQ3	.114	.267	1.000	.316	.261	.120	.046	-.069	-.142	.006	.080	.118	.097	.134
	LSQ4	.299	.430	.316	1.000	.199	.274	.149	-.061	-.108	-.004	.001	.172	.292	.255
	LSQ5	.056	-.004	.261	.199	1.000	.074	.218	.086	-.149	.043	-.086	-.012	.161	.029
	LSQ6	.260	.149	.120	.274	.074	1.000	.131	-.038	.044	-.015	.002	.186	.228	.180
	LSQ7	.170	.062	.046	.149	.218	.131	1.000	.109	-.004	.082	-.075	.072	.129	.166
	LSQ8	-.040	-.101	-.069	-.061	.086	-.038	.109	1.000	.207	.090	-.030	-.032	-.038	-.059
	LSQ9	.051	-.010	-.142	-.108	-.149	.044	-.004	.207	1.000	.174	.073	.002	.076	.077
	LSQ10	.121	-.032	.006	-.004	.043	-.015	.082	.090	.174	1.000	.091	.066	.090	.046
	LSQ11	.056	.088	.080	.001	-.086	.002	-.075	-.030	.073	.091	1.000	.124	-.058	-.048
	LSQ12	.065	.243	.118	.172	-.012	.186	.072	-.032	.002	.066	.124	1.000	.169	.186
	LSQ13	.181	.098	.097	.292	.161	.228	.129	-.038	.076	.090	-.058	.169	1.000	.271
	LSQ14	.159	.278	.134	.255	.029	.180	.166	-.059	.077	.046	-.048	.186	.271	1.000
Sig. (1-tailed)	LSQ1		.000	.000	.000	.014	.000	.000	.062	.023	.000	.015	.006	.000	.000
	LSQ2	.000		.000	.000	.441	.000	.008	.000	.354	.105	.000	.000	.000	.000
	LSQ3	.000	.000		.000	.000	.000	.038	.003	.000	.407	.001	.000	.000	.000
	LSQ4	.000	.000	.000		.000	.000	.000	.009	.000	.438	.491	.000	.000	.000
	LSQ5	.014	.441	.000	.000		.002	.000	.000	.000	.048	.000	.316	.000	.127
	LSQ6	.000	.000	.000	.000	.002		.000	.073	.044	.282	.467	.000	.000	.000
	LSQ7	.000	.008	.038	.000	.000	.000		.000	.445	.001	.002	.003	.000	.000
	LSQ8	.062	.000	.003	.009	.000	.073	.000		.000	.000	.125	.108	.072	.011
	LSQ9	.023	.354	.000	.000	.000	.044	.445	.000		.000	.002	.463	.001	.001
	LSQ10	.000	.105	.407	.438	.048	.282	.001	.000	.000		.000	.005	.000	.037
	LSQ11	.015	.000	.001	.491	.000	.467	.002	.125	.002	.000		.000	.012	.030
	LSQ12	.006	.000	.000	.000	.316	.000	.003	.108	.463	.005	.000		.000	.000
	LSQ13	.000	.000	.000	.000	.000	.000	.000	.072	.001	.000	.012	.000		.000
	LSQ14	.000	.000	.000	.000	.127	.000	.000	.011	.001	.037	.030	.000	.000	

a. Determinant = .228

The KMO statistics varies between 0 and 1. A value of 0 indicates that the sum of partial correlation is large relative to sum of correlations, indicating diffusion in the pattern of correlations. Furthermore, values between 0.5 and 0.7 are mediocre, values between 0.7 and 0.8 are good, and values between 0.8 and 0/9 are great values and above 0.9 are superb. For these data the value is 0.698, which falls into the range of being mediocre. Since the sample size is large the researcher gets into

the conclusion from various sources that the factor analysis is appropriate for this data (LSQ).

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.698
Bartlett's Test of Sphericity	Approx. Chi-Square	2215.205
	df	91
	Sig.	.000

The factor extraction table reveals the eigenvalues associated with each linear component (factor) before extraction, after extraction and after rotation. Before extraction, SPSS has identified 14 linear components within the data set. The eigenvalues associated with each factor represent the variance explained by that particular linear component and SPSS also displays the eigenvalue in terms of the percentage of variance explained. So in this proposed LSQ factor 1 explains 18.786% of total variance. Factor 2 explains 10.474%, factor 3 explains 9.796%, and factor 4 explains 8.070% o f total variance. The cumulative percentages of variance of these four factors are 47.126% to the total variance. The factors with eigenvalue greater than 1 are extracted, which leaves four factors for Lifestyle Questionnaire (LSQ). In the final part of the table the eigenvalues of the factors after rotation are displayed. Rotation has effect of optimizing the factor structure and one consequence for these data is that the relative importance of the four factors is equalized.

The communalities in the column labeled Extraction reflect the common variance in the data structure. At this stage SPSS has extracted four factors. Factor analysis is an exploratory tool and so it should be used to guide the researcher to make various decisions. One important decision is the number of factors to extract. However, the sample is huge and Kaiser's criterion gives recommendations for smaller samples we can use Scree Plot for determining the number of factors appropriate for this particular data set.

Communalities

	Initial	Extraction
LSQ1	1.000	.301
LSQ2	1.000	.510
LSQ3	1.000	.571
LSQ4	1.000	.564
LSQ5	1.000	.675
LSQ6	1.000	.339
LSQ7	1.000	.399
LSQ8	1.000	.434
LSQ9	1.000	.576
LSQ10	1.000	.457
LSQ11	1.000	.631
LSQ12	1.000	.304
LSQ13	1.000	.409
LSQ14	1.000	.428

Extraction Method: Principal Component Analysis.

Component Matrix

	Component			
	1	2	3	4
LSQ4	.729			
LSQ2	.591			
LSQ14	.541			
LSQ13	.520			
LSQ6	.517			
LSQ1	.510			
LSQ3				
LSQ12				
LSQ9		.723		
LSQ10		.538		
LSQ8		.500		
LSQ5			.675	
LSQ7				
LSQ11			-.514	.599

Extraction Method: Principal Component Analysis.
a. 4 components extracted.

The Scree Plot is shown below, it is interpreted that after the fourth component there is downward tendency in the curve. Moreover the curve begins to tail off after four factors. Therefore we could probably justify retaining four factors. More than that given the large sample, it is probably safe to assume Kaisers criterion. So for this particular LSQ four factors were extracted using Principal Component Analysis.

Scree Plot
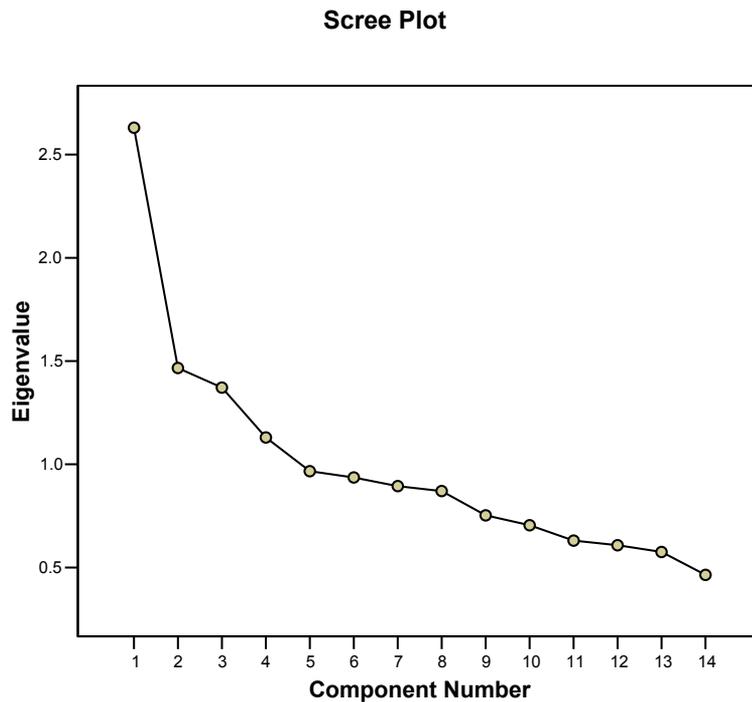
Two things considered about the format of rotated matrix. First, factor loadings less than 0.5 have not been displayed, and the second one, the variable are listed in the order of size of their factor loadings. The rotation of factor structure has clarified things considerably: there is four factors and variables LSQ13,LSQ14, LSQ4, LSQ6 an LSQ1 load on factor 1 LSQ5 and LSQ3 load on factor 2, LSQ8, LSq10 and LSq9 load on factor 3 and LSQ11 load on factor 4. LSQ 2, LSQ7 and

LSQ12 didn't load on any factors, so these questions were eliminated from Lifestyle Questionnaire for further analysis.

Rotated Component Matrix

	Component			
	1	2	3	4
LSQ14	.650			
LSQ13	.608			
LSQ4	.583			
LSQ6	.581			
LSQ1	.501			
LSQ2				
LSQ5		.771		
LSQ3		.630		
LSQ8			.632	
LSQ10			.630	
LSQ9			.548	
LSQ7				
LSQ11				.762
LSQ12				

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
  a. Rotation converged in 8 iterations.

Reliability Analysis for Lifestyle Questionnaire (LSQ)

Cornbach's alpha was computed for the revised LSQ after constructing the validity of the questionnaire. Before computing the Alpha value, LSQ2, LSQ7 and LSQ12 were eliminated because of their poor loading on the extracted factors during the validation process through Principal Component Analysis. Reliability statistics shows a Cronbach's Alpha value 0.495. Opinions differ about the ideal alpha value. Some experts recommend an alpha of ≥0.5 is acceptable and others suggest ≥0.70 is good for a new instrument (De Vellis 1991; Devon et al. 2007). In our study the alpha value is 0.495 and is less than the minimum value prescribed for

constructing reliability for a new instrument. So the items in the Physical Wellness Questionnaire are scrutinized using item total statistics.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based o n Standardized Items	N of Items
.495	.491	11

Item- Total Statistics

In the item total statistics we can see that by deleting the item LSQ8 alpha reaches the value 0.522.Since it is mandatory to reach a value ≥0.50 for alpha, the item LSQ8 is deleted from the final draft of Lifestyle Questionnaire. Moreover item LSQ8 is found to be not a significant item in the conceptual modeling and theoretical basis of the construct Lifestyle Assessment process. So the researcher took the decision to eliminate the item from the final draft.   By this test the 10 item for the Lifestyle Questionnaire is found reliable and decided to include in the final draft of the questionnaire

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
LSQ1	22.8534	17.100	.312	.150	.437
LSQ3	22.8315	17.737	.228	.167	.462
LSQ4	22.8806	16.115	.364	.271	.415
LSQ5	22.6536	18.173	.162	.139	.482
LSQ6	22.9290	17.607	.282	.140	.448
LSQ8	22.8301	19.586	.012	.075	.522
LSQ9	22.9602	18.976	.065	.139	.510
LSQ10	22.7585	18.283	.151	.065	.485
LSQ11	22.7007	19.640	.019	.042	.518
LSQ13	23.0471	17.115	.330	.175	.433
LSQ14	22.9091	17.060	.258	.135	.451

Conclusion

From the study conducted for the purpose of constructing a standardised questionnaire for measuring the Lifestyle pattern of the people Kerala a five-factor based Inventory was developed which is illustrated in the following table. It was also found that these factors can measure the lifestyle pattern of with high degree of validity and objectivity.

The four factor solution of the LSQ

Principal Component Analysis with Varimax rotation and Reliability Analysis.

Initial factors	Proposed items
Readiness to change	I want to make some changes in my life (LsQ14 – 0.650)
	I am ready to modify my behavior (LsQ13 – 0.608)
	I believe that health is a matter of choice (LsQ4 – 0.583)
	Exercise improves the quality of life (LsQ6 – 0.581)
	Enjoy life in a rewarding manner (LsQ1 – 0.501)
Health Locus of Control External	Health professionals control my health LsQ5 – 0.771
	My family has a lot to do with my becoming sick or staying healthy. (LsQ3 – 0.630)
Health locus of control Internal	I am ready to follow a health action plan (LsQ8 – 0.632) **
	If I get sick, my behavior determines how soon I get well (LsQ10 – 0.630)
	If I take right actions, I can stay healthy (LSQ9 – 0.548)
Risk Factor	I am not able to control my stress (LsQ11 – 0.762)

Eliminated Items After Extraction	Health is controlled by heredity (LsQ2)
	I am disappointed with my life now (LsQ7)
	Health is decided by uncontrollable factors (LsQ12)

** LSQ8 was eliminated after the reliability assessment

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