ORIGINAL ARTICLE

Applying the integrated behavioural model to identify predictors of utilisation of state-funded health insurance in Khyber Pakhtunkhwa province, Pakistan

Junaid Ur Rehman Siddiqui[1], Waqas Hameed[2], Mahnoor Fatima[3], Shifa Salman Habib[4], Kiran Sohail Azeemi[5], Ali Hussaini[6], Asma Altaf Hussain Merchant[7], Adil Haider[8], Sameen Siddiqi[9]

Abstract

Objective: To utilize the integrated behavioural model (IBM) for identifying predictors of utilization of state-funded health insurance in Khyber-Pakhtunkhwa province, Pakistan.

Methods: Using a cross-sectional design, the household survey was conducted across ten districts of the KP province during Nov 22-Feb 23 which included a total of 1750 households. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used to identify and validate the emerging factors, respectively. Structural equation modelling (SEM) was used to validate the causal relationships in the final model.

Results: Six factors were identified through EFA namely, Perception of Financial Protection, Perceived Benefits around Sehat Card Plus Programme (SCP-P), Perceived Norm around SCP-P, Personal Agency to use SCP-P, Intention to use SCP-P, and Knowledge of SCP-P. Factors' reliability and validity were established using CFA with coefficients > 0.7.The final structural model yielded a good fit with a Root Mean Squared Error of Approximation (RMSEA) <0.06 and Comparative Fit Index (CFA) >0.97. Perception of financial protection (B=-0.3) is inversely related to how people viewed the benefits of using SCP. In other words, the more people feel financially protected, the fewer benefits they see in the SCP-P. People's intention to use SCP in the future was mostly influenced by two factor: first, whether they felt using SCP was the norm (B= 0.6) or expected behaviour in the society like by friends and family, and second, whether they believed using SCP would be beneficial (B= 0.5). People's actual use of SCP in the past year was dependant on intention to use the programme (B=0.2), their knowledge as to how much they know about it (B=0.2), and their personal ability or control over using it (B=0.3).

Conclusion: The analyses guide SCP-P's communication and engagement strategy, emphasizing that programme efforts should focus on promoting positive perceptions and norms surrounding SCP, highlighting its benefits, providing education and information to enhance knowledge about SCP, and empowering individuals with a sense of personal agency to improve SCP utilization in the province.

Keywords: Integrated Behavioural Model (IBM), Health Insurance Utilization. Behaviour Model Validation, Structural Equation Modelling (SEM), Perception of Financial Protection. (JPMA 74: S-59 [Suppl. 11]; 2024)

DOI: https://doi.org/10.47391/JPMA.SCPP-09

Introduction

In Pakistan, like numerous low- and middle-income countries (LMICs), 50% of the total healthcare spending comes from out-of-pocket (OOP) payments.[1] Government funding accounts for less than 32% of the current health expenditure,[2] leaving approximately 13.2% of the population susceptible to financial catastrophe and impoverishment due to healthcare costs.[3] Research has documented that these direct healthcare expenses worsen economic hardships within low-income families and affect overall health outcomes.[4] Hence, Pakistan faces an urgent need to strengthen financial protection for its citizens and commit to achieving Universal Health Coverage (UHC).

[1-6,8]Department of Community Health Sciences, Aga Khan University, Karachi, Pakistan; [7]The Clinical and Translational Research Centre, Medical College, Aga Khan University, Karachi, Pakistan; [9]Medical College, Aga Khan University, Karachi, Pakistan.

Correspondence: Sameen Siddiqi. e-mail: sameen.siddiqi@aku.edu
ORICID: 0000-0001-8289-0964

The Sehat Card Plus (SCP) programme of the Khyber Pakhtunkhwa (KP) Government is designed to finance and oversee healthcare through risk pooling, primarily funded by the government. There is empirical evidence from various LMICs that such an approach shields individuals from financial and health burdens and is a relatively equitable means of financing healthcare.[5] However, state-funded health insurance is new in Pakistan and the coverage of this programme is relatively low, hence, there is a need for theory-informed communication strategy for this programme. The study will fill the literature gap on the subject as only a handful of studies in China have explored this phenomenon.[6]

Health measurement is a significant aspect within evaluations for practice, research, and trials.[7,8] Health evaluations have wide-spread implications to drive changes for improved health programming, practice, advocacy, and policy action.[9] However, most measures employed for evaluations are not psychometrically validated following an appropriate rigorous and

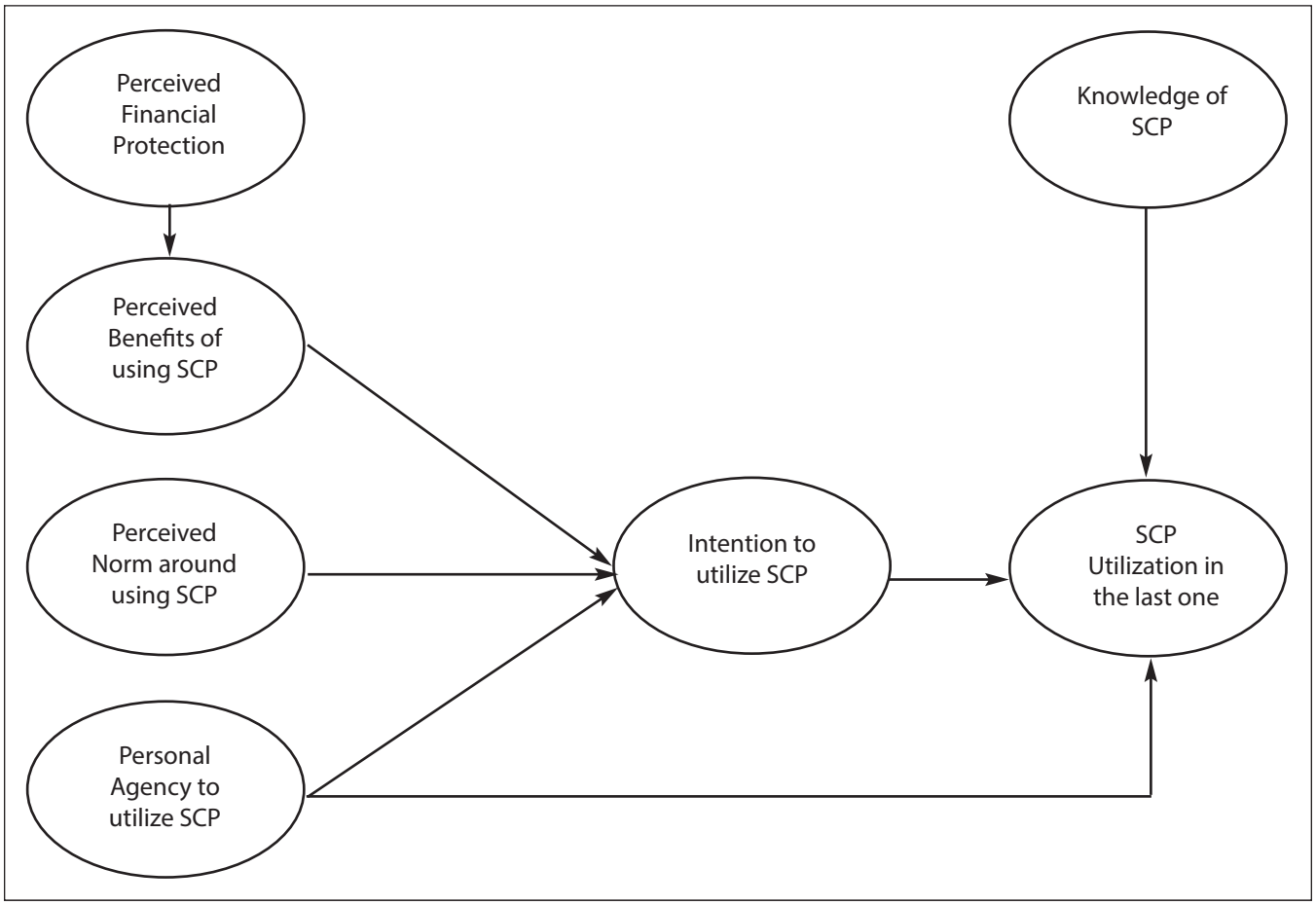

Figure-1: Hypothesised Model based on the Integrated Behavioural Model.

methodological process which limits the reliability and validity of findings, restricting their credibility, usefulness, and generalizability.[1] Psychometrics refers to the procedures that are deployed to construct scales for the measurement of psychological attributes[9] and became acceptable for evaluations due to their inherent ability to capture the subjective complexity of that also allows insight into the individuals' structure of their values and beliefs.[11]

Despite their incontrovertible utility, only a handful of studies have utilized and validated psychometric tools for application and behaviour modelling in Pakistan.[13-16] To bridge this gap in the context of evaluating health insurance programmes in Pakistan, this study aims to utilize the Integrated Behavioural Model (IBM) for informing factors and their measurement for predicting utilization of health insurance through the SCP programme. This study uses an established behavioural model to gain insights into the varied/multi-dimensional factors and the pathways through which these factors influence the utilization of SCP services.

This study adapts the well-established Integrated Behavioural Model (IBM) as the theoretical framework (Figure 1) to comprehensively examine the factors influencing the utilization of health insurance. Rooted in established psychological theories such as the Theory of Reasoned Action, the Health Belief Model, and the Theory of Planned Behaviour, the IBM provides a holistic understanding of health-related behaviours.[15-17] Focussing on the specific behaviour of health insurance utilization, this study will investigate the role of knowledge, perception of financial protection, attitude, perceived norm, personal agency, and intention in shaping an individuals' decisions to use health insurance.[18,19] By applying the IBM to this context, we aim to contribute valuable insights that can inform interventions and policies aimed at enhancing the effective utilization of health insurance, ultimately promoting better healthcare outcomes for individuals and communities.

Material and methods

A population-based cross-sectional survey was conducted in 436 clusters (also called 'enumeration blocks') across 10 selected districts of KP province. Assuming 58% anticipated

proportion with 3% margin of error, 95% confidence interval, 1.5 design effect and 10% non-response, a sample size of 1,733 households was estimated to assess the awareness/knowledge of SCP. Households in which at least one member was living, and where the household head was older than 18 years at the time of survey were invited to participate in this evaluation. The survey was completed by 1839 households.

The study used the sampling frame of 2017 National Census which is developed by the Federal Bureau of Statistics. A total of 20 urban-rural strata for each of the ten districts were created, followed by a random selection of clusters using probability proportional to the number of households in each cluster. Both the surveys were conducted in the same clusters. The strategy for the selection of households within clusters was such that the team identified a major landmark in each cluster and spin a bottle/pen on the ground to identify the direction of starting point. The kth interval varied for each cluster and was determined by dividing the number of households in the cluster with the desired sample.

A total of 44 ordinal questions using a 5-point Likert-scale were developed to assess behavioural predictors of health insurance utilization as outlined by the Integrated Behavioural Model (IBM). Questions were developed in Urdu using the DeVellis scale development guidelines with the questionnaire language informed by a comprehensive literature review of existing IBM scales validated for use in LMICs.[13,15,17-19,25]

Ten field teams were engaged for electronic data collection on tablets using REDCap, each lead by a district-level supervisor. The data collectors were local resident of each district and were familiar with geography and languages. The field team members were thoroughly trained by the Research Team of Aga Khan University (AKU) during a four-day workshop prior to data collection. The data collection took place from November 2022 to January 2023. Face-to-face interviews were conducted in home-based settings whereby the data were entered on the REDCap mobile application.

The characteristics of survey respondents were described using means, standard deviation, frequencies, and percentages. Wealth quintile was used as a primary measure of socio-economic position (SEP). The index was computed by using principal component analysis, based on information on household assets and amenities following demographic and health survey methodology. Stata SE 14.2 was used for this analysis and splitting the datasets for the psychometric analyses.

Table-1: Demographic Characteristics.

Respondent characteristics	n (%)
Sex	
Male	1,426 (77.54)
Female	406 (22.08)
Mean Age (years)	41.91±13.18
Religion	
Islam	1,826 (99.29)
Hinduism	1 (0.05)
Christianity	2 (0.11)
Ethnicity	
Pashtun	1336 (72.9)
Hindko	206 (11.2)
Seraiki	167 (9.1)
Chitrali	70 (3.8)
Others (Muhajir)	53 (2.8)
Education	
Illiterate (cannot read or write)	407 (22.13)
Primary	181 (9.84)
Secondary	199 (10.82)
Higher	682 (37.09)
Family system	
Joint	608 (33.06)
Nuclear	1,224 (66.56)
Head of household	1,233 (67.05)

Exploratory Factor Analysis (EFA) was used to drop items with low loadings (<0.5) and identify the optimal factor solution fitting the data.20 EFA was followed by a Confirmatory Factor Analysis (CFA) to confirm the factor structure of the measurement model. Reliability and validity estimates were obtained for ordinal alpha, ordinal omega, coefficient H, composite reliability, and average variance extracted (AVE) using the final factor loadings.[13,21,22] To account for the ordinal nature of items, polychoric correlations were used to run both EFA and CFA.23 Lastly, Structural Equation Modelling (SEM) using Polychoric Correlations and Asymptotic Covariances and Diagonally Weighted Least Squares Estimation (DWLS) was used for estimating the structural model for predicting SCP utilization.[14,23] For assessing model's goodness-of-fit, Kline (2010) recommends the following metrics and thresholds: Satorra-Bentler (SB) Chi-square (non-significant), Lower Akaike Information Criterion (AIC), Root Mean Squared Error of Approximation (RMSEA <0.06), Comparative Fit Index (CFI >0.95), Standardized Root Mean Residual (SRMR <0.08).[24]

The global dataset after removing cases with missing values (n=1,693) had been split for EFA, CFA and SEM; participants with a history of utilizing inpatient care (n=593) in the last one year were separated for SEM. The remaining 1,113 sample was randomly split into datasets with sample size 600 for EFA and 513 for CFA, respectively. With 44 items, the subject-to-variables ratio is greater than

10 for all three datasets indicating sample size adequacy.[21]

Results

Table 1 shows the background characteristics of the 1,839 respondents who took part in the survey. About two-third 1,233 (67%) of the respondents were heads of the household which culminated into 1,426 (77%) of the sample being male. The mean age of the respondents was 42±13.2 years. Ninety-nine percent of the respondents were Muslim with diversity within ethnicity, where 1336 (73%) of the respondents were Pashtun, 206 (11%) Hindko, and 167 (9%) Seraiki. With regards to education, 407 (22%) of the respondents were illiterate (who could not read or write), approximately 181 (10%) had completed primary-level education, 199 (11%) had completed secondary-level education, and 682(37%) had completed higher-level education. About two-thirds 1,224 (67%) of the respondents were living in a nuclear system. Moreover, nearly half 848 (46%) of the respondents belonged to Central KP i.e., Districts Abbottabad, Peshawar, and Swabi, followed by Northern KP i.e., Districts Chitral, Malakand, Swat, and Upper Dir 543 (29.5%), and Southern KP i.e., Bannu, Dera Ismail Khan, Kohat 448 (24.4%). Approximately 7 out of every 10 respondents resided in the rural areas as compared 512 (28%) who resided in urban areas.

With regards to accessibility to media, mobile phones and television were the most common information and communication devices used among the sampled respondents. Almost all households 1,755 (95.4%) had access to a mobile phone, and one-third of the households had access to internet services. About half of the households owned a television with 388 (21.1%) had a cable network. Twelve percent of the household had access to a radio, and 1 in every 10 households had access to a computer at home. Every 9 in 10 respondents reported to have heard of SCP Programme. Word of the mouth was the most cited source of information about SCP with relatives accounting for 561 (30%) and friends accounting for 417

Table-2: Reliability and Validity Metrics including Item Loadings.

Factors and Item Statements	Item Loadings	Avrage Variance Extracted (AVE)	Composite Reliability (CR)	Coefficient H	Alpha (α)	Omega (ω)
		Cut-off>0.5	>0.7	>0.7	>0.7	>0.7
Knowledge of SCP Programme		0.65	0.85	0.89	0.84	0.85
Know that SCP is government initiative	0.78					
Knows that SCP does not provide outpatient healthcare services	0.92					
Knows that all family members are eligible for treatment through the SLIC	0.70					
Attitude towards SCP Programme		0.57	0.80	0.83	0.79	0.80
Using health services under this programme could prevent financial hardship if you get sick	0.75					
This programme will help you protect your personal savings	0.65					
Hope that government should continue this SCP programme	0.86					
Personal Agency to Utilize SCP Programme		0.68	0.86	0.92	0.86	0.86
Can avail health services through SCP from a distant hospital	0.67					
Can access healthcare services through SCP in case of financial difficulty	0.94					
Confident about accessing health services through SCP	0.85					
Perceived Norm around Using SCP Programme		0.62	0.83	0.85	0.83	0.83
Household members favour availing healthcare services through SCP Programme	0.88					
People in area support healthcare services through SCP Programme	0.76					
People in area avail healthcare services through SCP Programme	0.72					
Intention to Utilize SCP Programme		0.81	0.93	0.94	0.93	0.93
Intention to use SCP programme in case medical care is needed in the future	0.90					
Intention to use SCP for ensuring your family's health and wellbeing	0.85					
Intention to utilize SCP Programme for healthcare services	0.95					
Perception of Financial Protection		0.79	0.92	0.92	0.92	0.92
Family can handle a major unexpected expense	0.89					
Family's financial future is secure	0.89					
Family has money left over at the end of the month	0.89					

Table-3: Model Goodness-of-Fit Statistics.

#	MODEL	n	SB Chi²	DF	p-value	RMSEA	AIC	CFI	SRMR
1	29-item Measurement Model	513	1434.168	362	p=0.00	0.0761 (0.0719; 0.0802)	1580.2	0.955	0.114
2	18-item Measurement Model	513	192.767	120	p=0.00	0.0344 (0.0251; 0.0432)	294.8	0.994	0.0539
3	Final Structural Model	577	417.734	141	p=0.00	0.0576 (0.0468; 0.0685)	747.829	0.966	0.106

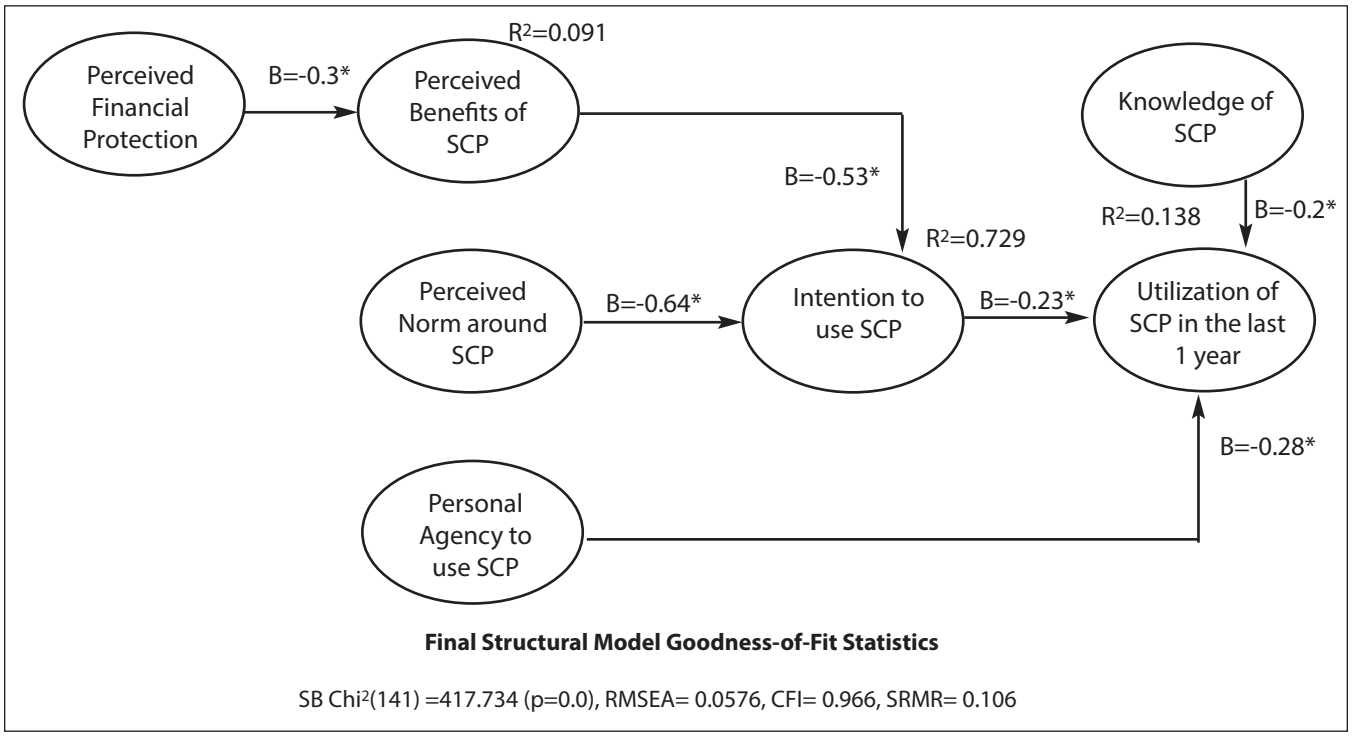

Figure-2: Final Structural Model for Utilization of SCP in the Last one year

(23%). This was followed by advertisement on TV 250 (14%), advertisement in Newspaper 158 (9%), and government SMS 119 (7%). Festival and other sources were the least popular sources two percent each. Furthermore, 1,418 (77%) knew that SCP is a government initiative.

EFA conducted on the first split-sample (n=600) revealed a six-factor solution to be optimal; 29 items were retained with loadings greater than 0.5. The six factors aligned with the six hypothesized factors of knowledge, perception of financial protection, attitude, perceived norm, personal agency, and intention. The identified factors were validated and refined on the second split-sample (n=513) through CFA. The initial 29-item measurement model yielded a poor fit with RMSEA and SRMR exceeding the acceptable cut-off values [SB $\chi 2$ (362, 513) = 1434.17 (p=0.00), CFI = 0.955, SRMR = 0.114, AIC=1580.2, RMSEA=0.076 (0.072; 0.082)] (Table 2). To achieve parsimony, three items with the highest loadings were retained for each factor resulting in 11 items being dropped.[24] The final measurement model with 18 items yielded a good fit affirming the validity of the survey instrument in gauging perceptions around SCP [SB $\chi 2$ (120, 513) = 192.77 (p=0.00), CFI = 0.994, SRMR = 0.054, AIC = 294.8 RMSEA = 0.034 (0.025; 0.043)] (Table 2). The loadings for each factor exceeded the recommended threshold of 0.5, ensuring the reliability of the constructs (Table 3) with AVE >0.5, Composite reliability, ordinal alpha and omega, coefficients > 0.7 for all factors, establishing the reliability of the final measures.

The three items for Knowledge of SCP assessed respondents' awareness of SCP being a government initiative, had knowledge of the absence of outpatient services, and were aware that all family members were eligible for treatment. Three items for Attitude towards SCP encompassed belief in its potential to prevent financial hardships, safeguard personal savings, and a general hope for the programme's continuity. Three items for Personal Agency assessed participants' confidence in accessing healthcare from distant locations, the ability to seek SCP services during financial difficulties, and an overall confidence in navigating the programme. Three items for Perceived Norm around SCP captured beliefs about household and community support for healthcare services, as well as the actual utilization of services in the community. Three items for Intention to Utilize SCP reflected participants' plans to use the programme for medical needs, ensure family health and wellbeing, and engage in healthcare services. Lastly, three items for Perception of Financial Protection explored participants' confidence in handling unexpected expenses, assurance in their family's financial future, and the belief that there was money left over at the end of the month, emphasizing the role of SCP in enhancing financial security and stability. The final scales were subsequently used in the SEM for predicting SCP utilization on the third sample (n=593) with only those participants who had utilized inpatient care in the last one year.

The final structural model yielded an adequate fit with only the SRMR exceeding the cut-off value [SB $\chi 2$ (141, 577)= 417.73 (p=0.00), CFI = 0.966, SRMR = 0.106, AIC = 747.83, RMSEA=0.057 (0.047; 0.069)] (Figure 2). Perception of financial protection (B=-0.3) is inversely related to how people viewed the benefits of using SCP. In other words, the more people feel financially protected, the fewer benefits they see in the SCP-P. People's intention to use SCP in the future was mostly influenced by two factors: first, whether they felt using SCP was the norm (B=0.6) or expected behaviour in the society like by friends and family, and second, whether they believe using SCP would be beneficial (B=0.5). Lastly, people's actual use of SCP in the past year was depended upon intention to use the programme (B=0.2), their knowledge like how much they knew about it (B=0.2), and their personal sense of ability or control over using it (B=0.3). Using Hayduk's Blocked-Error R2, the model explained 73% of the variance in Intention and 20% of the variance in Utilization.[15]

Discussion

The use of psychometrics as part of health measurement was initiated in the early 1980s. This adoption of psychometrics for health evaluations was in response to the shift in focus of measurement from disease-focused outcomes such as morbidity, mortality, prevalence, and burden to wider aspects of health such as clients' and patients' psychological attributes including knowledge, confidence in skills, and ability. One of the first healthcare evaluations that used psychometrics was the Health Insurance Experiment in the US which found that it generated reliable and valid measures that assessed changes in health status in general populations.[26]

This study utilized psychometric evaluation, using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), to establish a solid foundation for assessing the reliability and validity of the survey instrument. Challenges encountered in the initial model prompted adjustments, leading to the development of a refined model with improved fit statistics. The final structural model demonstrated satisfactory indices, affirming the reliability and validity of the measurement constructs. Furthermore, the model exhibited cultural congruence with the study setting leading to a successful cross-cultural application and validation in Pakistan. This was particularly noteworthy considering its successful prior application and validation for other behaviours in Pakistan, highlighting the cross-cultural and expansive generalizability of the IBM.[13] This study showed that people with financial stability are less likely to see benefits of the SCP programme and vice versa. Furthermore, people who find the programme to be beneficial and have social support are likely to have higher intention to use the programme in the future. Due to the collectivist nature of the Pakistani community, improving social norm for using SCP through community-based interventions is particularly important. Subsequently, future intention, personal agency, and knowledge predicted utilization of SCP in the last one year. Since inpatient hospital admission is usually an unpredictable and high expenditure event, people have little volition over going to the hospital. If the hospital is covered under the SCP programme, people are likely to opt for using SCP even without any prior intention to do so.[13,15,17] Considering the importance of agency, reimbursements for transportation expenses can be considered to enhance it further.

The final model underscored the interconnected nature of factors shaping perceptions. Most notably, the perception of financial protection emerged as a crucial determinant, influencing participants' perceived benefits, and subsequently impacting their intention to use and actual utilization of SCP services. These findings underscore the pivotal role of financial considerations in healthcare decision-making within the studied population.

Building upon these findings, a targetted communication and engagement strategy should be developed to focus on accentuating the perceptions of financial protection aspect of the SCP programme. Emphasis should be placed on reinforcing the programme's fundamental attributes and continuity through widely accessible channels such as mobile phones and television. Direct community engagement, facilitated by community-based events and leveraging word of mouth, should be leveraged upon for enhancing awareness and understanding of SCP, particularly addressing concerns related to financial protection and programme benefits.

Conclusion

Using psychometrically validated measures is crucial for the nuanced evaluation of healthcare programmes in Pakistan. The study's findings, grounded in robust psychometric analysis, contribute valuable insights into the psychosocial factors driving utilization of the SCP programme. The identified factors, especially the influence of financial protection on programme utilization, highlight critical considerations for programme design and communication strategies. By incorporating these insights, policymakers and healthcare professionals can enhance service coverage, effectiveness and impact of SCP, ultimately contributing to improved healthcare access and outcomes in Pakistan.

Disclaimer: The article has not been submitted to any international/national platforms or academic journals.

Conflict of interest: None.

Funding disclosure: This study constituted a pivotal

component of the comprehensive Third-Party Evaluation of the Sehat Card Plus Programme in the Khyber Pakhtunkhwa Province. The research initiative was financially supported by the German Agency for International Cooperation (GIZ).

References

1. Pakistan Bureau of Statistics (PBS). Pakistan Social & Living Standards Measurement Survey (PSLM) 2018-19 National/Provincial (Social Report). [Online] 2020 [Cited 2024 October 13]. Available from URL: https://www.pbs.gov.pk/sites/default/files//pslm/publications/pslm 2018-19/pslm_report_2018-19_national_provincial.pdf
2. Hodges-Mameletzis I, Dalal S, Msimanga-Radebe B, Rodolph M, Baggaley R. Going global: the adoption of the World Health Organization's enabling recommendation on oral pre-exposure prophylaxis for HIV. Sex Health 2018;15:489-500. doi: 10.1071/SH18125
3. Bashir Q, Usman A, Amjad A, Amjad U. 'The Taboo that Silences': Awareness about Sexual and Reproductive Health Issues among Adolescent Females during Pubertal Transition. Isra Med J 2017;9:381-5.
4. Khan SU, Hussain I. Inequalities in health and health-related indicators: a spatial geographic analysis of Pakistan. BMC Public Health. 2020;20:1800. doi: 10.1186/s12889-020-09870-4.
5. World Health Organization. Social Health Insurance: Report of a Regional Expert Group Meeting New Delhi, India, 13-15 March 2003. New Delhi, India: World Health Organisation; 2003. [Online] 2003 [Cited 2024 October 13]. Available from URL: https://iris.who.int/handle/10665/206364
6. Shan L, Wu Q, Liu C, Li Y, Cui Y, Liang Z, et al. Perceived challenges to achieving universal health coverage: a cross-sectional survey of social health insurance managers/administrators in China. BMJ Open 2017;7:e014425. doi: 10.1136/bmjopen-2016-014425
7. Cano SJ, Hobart JC. The problem with health measurement. Patient Prefer Adherence 2011;5:279-90. doi: 10.2147/PPA.S14399
8. Department of Health (DH). High quality care for all: NHS Next Stage Review final report. Surrey, UK: Crown; 2008.
9. Leviton LC, Khan LK, Rog D, Dawkins N, Cotton D. Evaluability assessment to improve public health policies, programs, and practices. Annu Rev Public Health 2010;31:213-3. doi: 10.1146/annurev.publhealth.012809.103625
10. Guilford JP. Psychometric Methods. New York, NY: McGraw-Hill; 1954.
11. Nunnally JC. Psychometric Theory, 2nd ed. New York, NY: McGraw-Hill; 1978.
12. Glasgow RE, Riley WT. Pragmatic measures: what they are and why we need them. Am J Prev Med 2013;45:237-43. doi: 10.1016/j.amepre.2013.03.010
13. Gul AX. Application of the Integrated Behavior Model to Explain and Promote Uptake of Modern Family Planning Methods among Married Women of Reproductive Age in Rural Areas of Punjab, Pakistan: The IRADA Project. [Online] 2021 [Cited 2024 October 14]. Available from URL: https://www.proquest.com/openview/0659fdd31ab5af1d0fe4206f02c794ed/1.pdf?pq-origsite=gscholar&cbl=18750&diss=y
14. Gul X, Siddiqui JU, Mavalvala M, Hameed W, Ishaque M. Development and validation of a psychometric scale to assess attitude towards safe abortions in Pakistan. J Pak Med Assoc 2021;71:124-6. doi: 10.47391/JPMA.503.
15. Siddiqui JR. Evaluating the Effectiveness of Reasoned-action Theories (TRA, TPB, IBM) for Explaining Low E-commerce Adoption in a Developing Country: A Structural Equation Modelling (SEM) approach. Trends Comput Sci Inf Technol 2022;7:035-46. DOI: 10.17352/tcsit.000049
16. Siddiqui JR, Hussain S, Pirzada N, Khan HM, Khan U, Ijaz A, et al. Applying the Integrated Model of Menstrual Experience to Validate a Framework for Healthy Menstrual Experience for Young Girls in Pakistan through Structural Equation Modelling. Womens Health Res 2021;3:17-31. DOI: 10.1057/whr000014.
17. Kasprzyk D, Montaño DE, Fishbein M. Application of an integrated behavioral model to predict condom use: a prospective study among high HIV Risk Groups 1. Journal of Applied Social Psychology 1998;28:1557-83. doi: 10.1111/j.1559-1816.1998.tb01690.x
18. James TG, David Miller M, Nicolette G, Cheong J. Psychometric Evaluation of a 10-Item Health Insurance Knowledge Scale. J Nurs Meas 2021;29:491-504. doi: 10.1891/JNM-D-20-00019
19. Shan L, Wu Q, Liu C, Li Y, Cui Y, Liang Z. et al. Perceived challenges to achieving universal health coverage: a cross-sectional survey of social health insurance managers/administrators in China. BMJ Open 2017;7:e014425. doi: 10.1136/bmjopen-2016-014425
20. Costello AB, Osborne J. Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis. Pract Assess Res Eval 2005;10:7. doi: 10.7275/JYJ1-4868
21. Fornell C, Larcker DF. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. J Mark Res 1981;18:39-50. doi: 10.1177/002224378101800104
22. Gadermann AM, Guhn M, Zumbo BD. Estimating ordinal reliability for Likert-type and ordinal item response data: A conceptual, empirical, and practical guide. Pract Assess Res Eval 2012;17:3. doi: 10.7275/N560-J767
23. Jöreskog KG. On the estimation of polychoric correlations and their asymptotic covariance matrix. Psychometrika 1994;59:381-389. doi: 10.1007/BF02296131
24. Kline RB. Principles and Practice of Structural Equation Modeling, 4th ed. New York, NY: The Guilford Press; 2016.
25. DeVellis RF. Scale Development: Theory and Applications, 3rd ed. Newcastle upon Tyne, UK: SAGE; 2012.
26. Aron-Dine A, Einav L, Finkelstein A. The RAND Health Insurance Experiment, three decades later. J Econ Perspect 2013;27:197-222. doi: 10.1257/jep.27.1.197.