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Design and validation of a tool to measure the Knowledge, Attitude, and Performance of health workers regarding population growth policies

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Abstract

Background: The decline in fertility rates, including in Iran, poses demographic challenges like an aging population and a reduced workforce. Iran's fertility rate has fallen below replacement levels. In 2021, legislation was passed to improve fertility and population quality. The law's success depends on the Ministry of Health personnel, as their knowledge and attitudes affect community reproductive behaviors. However, there are no standardized tools to evaluate these factors among Iranian healthcare professionals regarding the new population policies.

Objectives: This study aims to create and validate a reliable tool to assess Iranian healthcare workers' knowledge, attitudes, and practices regarding population growth policies.

Methods: This instrument development study was conducted in Mashhad during 2022–2023 to design and validate a questionnaire on healthcare providers' awareness. The initial item pool was derived from the Ministry of Health's checklist and refined through expert review and consultations with officials from the Health Vice-Chancellor of Mashhad University of Medical Sciences. Overlapping items were removed, and the finalized questions were compiled into the preliminary instrument. Content validity was evaluated using CVR and CVI by 12 experts. Reliability was assessed among 65 healthcare personnel, including physicians, midwives, nurses, and health workers, using Cronbach's alpha and test–retest methods. Data analysis was performed with SPSS using descriptive and nonparametric statistics.

Results: The results showed that 12 items were not suitable in terms of content validity and were removed from the questionnaire, while the other questions remained in the questionnaire with some minor modifications in the writing. The final questionnaire comprised 40 valid items encompassing the domains of knowledge, performance, attitudes towards population growth, and attitudes towards socio-legal and cultural contradictions. Reliability metrics indicated robust internal consistency, with Cronbach's alpha exceeding 0.85 across all domains, and demonstrated satisfactory test-retest reproducibility, with an Intraclass Correlation Coefficient (ICC) of 0.83 or greater.

Conclusion: This validated questionnaire is a key tool for assessing health workers' knowledge, attitudes, and practices about population growth policies in Iran. It aids in targeted educational interventions and policy monitoring, supporting demographic goals amid declining fertility trends.

Keywords: knowledge, attitudes, performance, population policy.

1. Background

The dynamics of population change constitute critical factors influencing the social, economic, and cultural structures of

nations. Among these factors, fertility rate emerges as one of the three primary determinants of population growth, alongside mortality and migration, and plays a vital role in this process (1). Recent decades have witnessed a significant and sustained decline in fertility rates across numerous developed and developing countries. Most European nations have experienced a persistent decline in fertility rates, with current levels now approaching or falling below the replacement level of 2.1 births per woman (2). This phenomenon is not confined to Europe; it has also affected many Asian countries. For instance, in East Asia, all nations except Mongolia have seen their fertility rates drop below the replacement level. Similarly, in Southeast Asia, countries such as Malaysia, Singapore, Thailand, and Vietnam have achieved sub-replacement fertility, with Iran being the only country in South-Central Asia to exhibit this distinct trajectory (3).

Numerous factors have been identified as drivers of this global demographic transition. Research by Abbasi-Shavazi and Gubhaju, which examined fertility trends in 18 Asian countries from 2005 to 2010, demonstrated that the total fertility rate had reached replacement level during this period. Key contributors to this decline include the postponement of childbearing, increased contraceptive use, rising age at marriage, advancements in female education, and greater participation of women in the labor force, combined with continued social non-acceptance of cohabitation and childbearing outside of marriage. This pattern is evident globally; similarly, Makinwa-Adebusoye noted that reduced under-five mortality, the widespread adoption of modern contraceptive methods, and an increasing age at marriage significantly contributed to fertility reduction in several African countries. In the specific context of Iran, this reduction can also be viewed as a consequence of shifts and progress within traditional family structures, driven by socio-economic developments and the adaptation of families to modern fertility norms (4).

Iran has experienced a particularly pronounced pattern of fertility decline. Statistical data clearly illustrate this consistent downward trend, with the average annual population growth rate decreasing from 3.25% in 1991 to 1.62% in 2006 and further to 1.3% in 2011 (5). This decline is attributed to a demographic transition that began after the Second World War, characterized by a significant reduction in mortality rates resulting from substantial improvements in healthcare (6). The remarkable success of family planning programs in the second decade following the revolution effectively reversed previous growth trends, reducing the annual growth rate from 3.9% during 1976-1986 to 1.96% during 1986-1996, and finally to 1.61% during 1996-2006 (7).

Current demographic analyses indicate that Iran has entered a new and critical phase of demographic change. The hallmark of this emerging period is a persistent decline in fertility rates, now stabilized below the replacement level, followed by a subsequent annual decrease in population growth. The implications of this trend are profound for the nation's population dynamics. Should the fertility rate remain consistently below the replacement level, it will pose substantial long-term challenges for the country, including an aging population and a shrinking workforce (8).

In direct response to these pressing concerns, the Islamic Consultative Assembly approved and promulgated the Law on Protecting the Family and Youth of the Population in 2021(9). This comprehensive legislation primarily aims to elevate the total fertility rate above the replacement level and enhance qualitative population indicators. Its strategies involve extending

substantial support to families with at least three children, new mothers, infertile couples, pregnant women, and mothers with children under two years old (10). The imminent closure of Iran's demographic window of opportunity by approximately 2046 has rendered the implementation of this law a national priority of utmost significance.

The successful execution and ultimate effectiveness of this ambitious population policy hinge critically on the frontline health personnel of the Ministry of Health and Medical Education. These healthcare workers serve as the crucial interface between policy and the community. Their competence, mindset, and practices directly influence their interactions with women of reproductive age and their partners, thereby significantly impacting their ability to effectively guide, counsel, and support fertility choices within society. Given this pivotal role and the precarious demographic state of the nation, a thorough assessment of their Knowledge, attitudes, and practices (KAP) is imperative to identify and address potential deficiencies. However, despite the critical importance of this subject, there appears to be a lack of a standardized and contextually adapted instrument for accurately assessing these key indicators among Iranian healthcare workers regarding new population growth policies. Consequently, the design and validation of such a tool is not merely a research necessity but a fundamental step towards supporting the new law, enabling effective educational planning, identifying knowledge gaps, and ultimately ensuring the successful implementation of national population policies. This study aims to address this gap by developing and validating a reliable instrument to measure these core components, thereby providing a valuable foundation for strategic intervention and future research.

2. Objective

The primary objective of this study is to design and validate a reliable and valid research instrument for assessing the Knowledge, attitudes, and practices (KAP) of Iranian healthcare workers regarding population growth policies.

3. Methods

This cross-sectional study was conducted from 2022 to 2023 to assess the Knowledge, Attitude, and Performance of health personnel about population increase policies in Mashhad city. The study population consisted of personnel working in the health centers of Mashhad, including doctors, midwives, healthcare workers, and nurses, who were directly involved in implementing the country's population growth policies. The inclusion criteria for the study consisted of all personnel working in the health centers of Mashhad, under the supervision of the Health Deputy, from the groups of community health workers, healthcare providers, midwives, and doctors.

The stratified sampling method was used, and participation in this study was based on obtaining informed consent. The final sample size was determined after completing the questionnaire and confirming its validity and reliability. Taking into account the first type error of 5%, the second type error of 20%, and the test power of 80%, and according to the purpose of determining the relationship between variables. The sample size was measured using the following formula:

$$n = \frac{2(Z_{1-\frac{\alpha}{2}} - Z_{1-\beta})\text{^}2}{\ln(\frac{1+r}{1-r})} + 3$$

Finally, the sample size was estimated using the results of the first sample (pilot) with the lowest correlation value (i.e., r =

0.163) between the Knowledge, Attitude, and performance relationships observed.

To develop the questionnaire, the initial phase involved conducting a thorough search for relevant materials in reputable scientific databases on the Internet, including PubMed and Google Scholar. The search reviewed various sources using keywords such as "knowledge, attitude, performance, questionnaire, population increase policies" and their corresponding English counterparts. Upon reviewing the existing literature, it became evident that there is a lack of a standardized questionnaire regarding the country's population growth policies. Hence, through the analysis of comparable research on Knowledge, Attitude, and Performance in different fields, a revised questionnaire was developed based on an existing standard questionnaire. To conduct this purposeful and scientific survey effectively, it was imperative to utilize a standardized tool and questionnaire. So far, various methods have been proposed to assess the validity of questionnaires, including content validity, face validity, and construct validity (11). For details of statistical methods, statistical models, and dependency concepts, see (12, 13).

To enhance accuracy and increase the scientific and practical significance of designing the questionnaire, the questions from the checklist devised by the Ministry of Health for monitoring the awareness level of healthcare providers, including nurses, midwives, and doctors, were incorporated into this survey. This research team meticulously analyzed the questions included in the selected questionnaires. Additionally, they conducted meetings with officials from the Health Vice-Chancellor's office at Mashhad University of Medical Sciences, who are involved in population policies. Through these interactions, the team successfully compiled the selected questions. Upon removing the similar questions, the research team proceeded to approve the remaining ones, which ultimately formed the final selection. Following this, the initial questionnaire was compiled. The content validity of the questionnaire was assessed in the second step. A total of 15 experts, professors, and officials were purposefully chosen for a non-random evaluation. The researchers took into account their opinions while evaluating the questionnaire. Two measures, namely the content validity ratio (CVR) and the content validity index (CVI), are employed to assess the suitability of the questionnaire. Subsequently, the questionnaire is made available to a panel of experts who have been carefully chosen for their expertise in the field. The questionnaire is evaluated using the content validity ratio, which assesses the necessity of the questions, and the content validity index, which evaluates the simplicity and clarity of the questions.

After inputting the data provided by the experts into the computer and performing mathematical calculations using Excel, the content's validity was assessed using the mentioned pair of indicators. The content validity ratio index is employed to determine the necessity of each question in the questionnaire. This index categorizes each question into one of three options: 1) The item is necessary, 2) The item is useful but not necessary, or 3) The item is not necessary.

$$CVR = \frac{Ne - (N/2)}{(N/2)}$$

In the given equation, N represents the overall count of experts, while Ne denotes the specific count of experts who have opted for the "necessary" choice. The content validity index is employed to determine the relevance of each question in the questionnaire, which consists of four options: "1- Not relevant, 2- Needs basic revision, 3- Relevant but needs revision, 4- Relevant." The relevance of each question is

calculated using this index.

$$CVI = \frac{m}{N}$$

The total number of experts, denoted as N, along with the number of elites who have selected option 3 or 4, represented as m, are the variables in consideration. According to this computation, questions that have a score exceeding 0.79 are deemed suitable, those falling within the range of 0.70 to 0.79 require correction, and those scoring below 0.70 are considered unacceptable. For further information on the calculations of these two metrics, please refer to the reference (14).

The questionnaire's reliability (internal consistency and repeatability) was determined as the third step. For this purpose, 65 individuals were initially sampled, including 10 doctors, 20 healthcare workers, 20 midwives, and 15 nurses. Initially, the survey was disseminated among a group of 65 individuals who were carefully chosen to ensure internal consistency. Subsequently, upon completion and inputting the data into the software, the questionnaire questions underwent analysis to determine Cronbach's alpha. Subsequently, to ensure the replicability of the survey, a group of ten individuals participated in the questionnaire using the test-retest approach. Following a two-week interval, the identical group of ten individuals once again completed the questionnaire. Upon completion of the two-stage questionnaire and subsequent data entry into the software, the correlation coefficient was computed.

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4.Result

In this investigation, the average age of participants is 40.19 years. The sample

consists predominantly of females (90.75%) and married individuals (84.93%). Most have a Bachelor's degree (59.93%) and work as midwives or nurses (39.22%) or in other healthcare roles (31.80%) (Table 1).

Table 1. Demographic characteristics of participants in this survey from Mashhad, 2022-2023 (N = 292)

Age (year) Mean ± SD	**40.19 ± 7.32**
Gender n (%)	
Male	**27(9.25)**
Female	**265(90.75)**
Marital Status n (%)	
Married	**248(84.93)**
Single	**39(13.36)**
Divorced	**5(1.71)**
Education n (%)	
Diploma and postgraduate diploma	**63(21.95)**
Bachelor's degree	**172(59.93)**
Master's degree	**19(6.62)**
PhD	**33(11.50)**
Job status n (%)	
Health Worker	**49(17.31)**
Doctor	**33(11.66)**
Midwife or Nurse	**111(39.22)**
Healthcare workers	**90(31.80)**

In this study, the formal and qualitative validity of the questionnaire was established with experts' opinions. The questionnaire was given to 12 professors and elites. The questionnaire retained the questions that achieved an 81% agreement on their significance. Moreover, corrective opinions were expressed, and based on these opinions and the perspectives of certain executive officials, including the Vice-Chancellor of Health at Mashhad University of Medical Sciences, alterations were introduced to the questionnaire.

The content validity ratio (CVR) index was utilized to assess the quantitative validity of the questionnaire's content. The analysis revealed that nine items of the questionnaire had a ratio below 62/1, indicating a lack of content validity. Consequently, these items were excluded from the questionnaire. Moreover, the CVI content validity index assessment indicated that three items scored less than 62.1, necessitating their removal from the questionnaire. Consequently, the final version of the questionnaire encompassed a total of 40 items. The remaining questions in the survey possess the validity indicators mentioned in Tables 2 and 3. These indicators are included in the final version of the questionnaire, and certain items have changed attitudes.

Table 2. Report of validity and reliability indicators in the two fields of Knowledge and Performance

Knowledge field			Performance field			
Question	CVR	CVI	Question	CVR	CVI	Cronbach's alpha
knowledge-q1	0.64	0.82	performance-q1	0.64	0.90	0.852
knowledge-q2	0.82	1.00	performance-q2	0.78	1.00	0.853
knowledge-q3	0.82	0.91	performance-q3	0.78	0.90	0.855
knowledge-q4	0.64	1.00	performance-q4	0.64	1.00	0.852
knowledge-q5	0.64	1.00	performance-q5	0.64	0.89	0.866
knowledge-q6	0.78	1.00	performance-q6	0.78	0.80	0.857
knowledge-q7	1.00	1.00				
knowledge-q8	0.80	1.00				
knowledge-q9	1.00	0.91				
knowledge-q10	0.64	1.00				
Total Cronbach's alpha				0.86		

Following the completion of questionnaires by a sample of 18 individuals from the research population, which included doctors, healthcare workers, midwives, and nurses, the performance questions exhibited a Cronbach's alpha coefficient value of 0.86. Additionally, the Attitude towards population increase displayed a coefficient of 0.91, while the Attitude towards legal-social and cultural contradictions yielded a coefficient of 0.885, which exhibits a robust internal consistency, highlighting its reliability. However, it is significant to note that the knowledge questions were not subjected to this measurement criterion as they did not originate from the Likert scale. To evaluate the reproducibility of the questionnaire, ten participants were selected to complete the questionnaire twice through the test-retest method. Furthermore, after a two-week interval, they were asked to complete it again.

After conducting the questionnaire in two phases and inputting the data into the software, the intra-class correlation coefficient (ICC) was computed for every section of the questionnaire. The ICC for inquiries in the realm of Knowledge stood at 0.94, while performance exhibited a value of 0.91. Moreover, the Attitude towards population increase was measured at 0.87, and the Attitude towards legal-social and cultural contradictions yielded a coefficient of 0.83. Based on the findings presented in Table 3, it can be inferred that the various sections of the survey exhibited a significant level of reproducibility.

Table3. Report of validity and reliability indicators in the two areas of population growth and legal contradictions

Attitude field (population increase)				The field of Attitude towards legal-social contradiction			
Questions	CVR	CVI	Cronbach's alph	Questions	CVR	CVI	Cronbach's alph
attitude1-q1	0.60	0.82	0.904	attitude2-q1	0.64	0.90	0.852
attitude1-q2	0.80	0.90	0.901	attitude2-q2	0.78	1.00	0.853
attitude1-q3	0.80	0.91	0.917	attitude2-q3	0.78	0.90	0.855
attitude1-q4	0.60	0.91	0.905	attitude2-q4	0.64	1.00	0.852
attitude1-q5	0.80	1.00	0.921	attitude2-q5	0.64	0.89	0.866
attitude1-q6	0.80	0.82	0.899	attitude2-q6	0.78	0.80	0.857
attitude1-q7	0.60	0.91	0.911	attitude2-q7	0.78	1.00	0.880
attitude1-q8	0.80	0.90	0.911	attitude2-q8	0.78	0.90	0.907
attitude1-q9	0.20	0.82	0.933	attitude2-q9	1.00	1.00	0.922
attitude1-q10	0.20	0.82	0.924	attitude2-q10	0.78	0.70	0.876
attitude1-q11	0.80	0.91	0.900				
Total Cronbach's alpha	0.91			Total Cronbach's alpha	0.885		

In Table 4, significant gender differences were observed in Knowledge (p = 0.028) and performance (p = 0.039), with females scoring higher than males. No significant differences were found in Attitude (p = 0.278) or Attitude towards Legal Social Contradictions (p = 0.197) between genders. Marital Status did not significantly affect Knowledge (p = 0.798), performance (p = 0.801), Attitude (p = 0.864), or Attitude towards Legal Social Contradictions (p = 0.926). Significant differences in performance were noted among different Job roles, with Health Workers and Healthcare Workers scoring higher than Doctors (p < 0.001). There were no significant differences in Knowledge (p = 0.268), Attitude (p = 0.407), or Attitude towards Legal Social Contradictions (p = 0.337) based on job role. Education level had a significant impact on performance (p < 0.001), with lower educational attainment being associated with lower performance scores. However, Knowledge (p = 0.705) and Attitude (p = 0.663) were not significantly affected by education level, and Attitude towards Legal Social Contradictions showed no significant variation (p = 0.332) across educational levels.

Table 4. Descriptive statistics and comparative analysis of Knowledge, Performance, Attitude, and Attitude towards legal social contradictions by demographic and professional factors

Variables		Knowledge			Performance			Attitude			Attitude towards legal social contradictions		
		Mean	S. D	P-value	Mean	S. D	P-value	Mean	S. D	Pvale	Mean	S. D	Pvalue
Gender	Female	8.78	1.73	0.028	35	7.57	0.039	40.66	8.55	0.278	29.14	7.19	0.197
	Male	7.74	2.49		33	5.16		39.19	7.51		31.37	6.70	
Marital Status	Married	8.67	1.89	0.798	35	7.25	0.801	40.45	8.71	0.864	29.42	7.08	0.926
	Single	8.72	1.39		35	8.13		40.67	7.11		28.69	8.02	
	Divorced	9.40	2.07		32	9.91		43.00	5.70		30.80	4.82	
Job	Health Worker	8.49	1.60	0.268	37	5.72	<0.001	40.69	5.88	0.407	30.39	5.90	0.337
	Doctor	8.33	2.25		28	6.38		38.82	10.65		29.42	8.22	
	Midwife or Nurse	8.99	1.51		35	6.78		41.27	9.11		29.30	8.22	
	Healthcare workers	8.72	1.74		37	6.47		40.26	7.44		28.79	5.86	
Education	Diploma and postgraduate diploma	8.63	1.57	0.705	38	5.88	<0.001	41.21	6.40	0.663	30.52	5.84	0.332
	Bachelor's degree	8.79	1.77		36	6.74		40.85	8.08		29.25	7.00	
	Master's degree	8.84	1.50		33	9.51		37.84	12.32		26.11	9.47	
	PhD	8.33	2.25		28	6.38		38.82	10.65		29.42	8.22	

In the questionnaire, the type of questions in the knowledge section differs from those in other sections, so the knowledge section was removed to conduct a confirmatory factor analysis of the questions within it. Confirmatory factor analysis (Figure 1) confirmed the construct validity of the questionnaire, with factor loadings of 0.4 or higher in all questions (Figure 1). In addition, the results of the goodness-of-fit index for the model are seen to be appropriate (Chi-square/df = 2.964, CFI = 0.901, and RMSEA = 0.058).

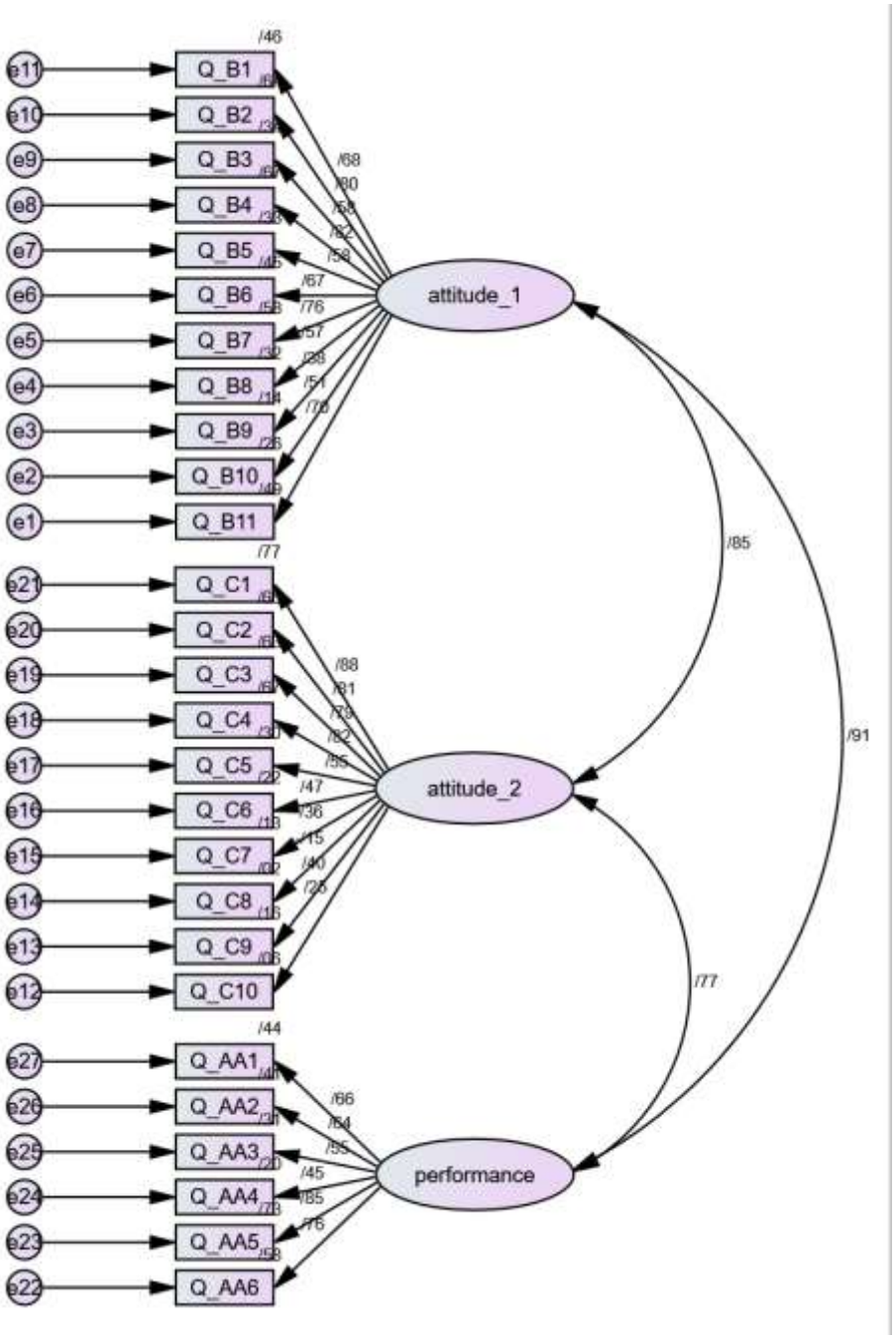

Figure 1. Fitting confirmatory factor analysis to assess the construct validity of a questionnaire

5. Discussion

In 2021, the Islamic Council approved and promulgated a law aimed at safeguarding the family and youth of the population, in response to the crisis arising from the issue of population growth. The implementation of this law holds significant importance due to the closing of the demographic window in 2046 (3). The practical implementation of this law heavily relies on the health personnel from the Ministry of Health and the universities of medical sciences. The Knowledge, Attitude, and Performance of this group of providers, who are directly connected with women of reproductive age and their partners, significantly contribute to guiding, enhancing, and supporting the fertility

decisions of these women within the community (2). Considering the critical conditions prevailing in the country, it is of utmost importance to scrutinize the Knowledge, Attitude, and Performance of healthcare personnel in medical science universities to eliminate any possible deficiencies (16). To accomplish this purposeful and scientific survey, it is essential to employ a standardized tool and questionnaire(10). This study was undertaken to address the absence of a standardized questionnaire for assessing the Knowledge, Attitude, and Performance of healthcare professionals regarding population growth policies. The primary objective was to develop a standardized questionnaire and evaluate its validity and reliability. The subsequent explanation elucidates the process of modifying the questions within the questionnaire.

A: Questions of the knowledge field:

Initially, 12 knowledge-based questions were formulated, each offering three possible options for response: 1-True, 2-False, and 3-I do not know. Following the assessment of validity and reliability, one question was excluded, while six questions were retained without modification. Furthermore, four questions were merged and transformed into a multiple-choice format.

B: Questions of the performance field:

Initially, to measure the overall performance, a set of a series of 10 questions with five possible choices, including: 1) "I am completely successful," 2) "I agree," 3) "No opinion," 4) "I disagree," and 5) "I completely disagree." A set of five questions, each offering five response options, including 1-"not at all," 2-"rarely," 3-"moderately," 4-"very much," 5-"completely," was meticulously designed to evaluate the specialized job performance. Upon completing the validity and reliability checks and applying the expert opinions, the assessment was developed to encompass six general performance questions, plus two multiple-choice questions for specialized performance evaluation. The questions were divided into two categories for the doctor's profession, three categories for the midwife or nurse position, and four categories for a career as a nurse and healthcare worker.

C: Questions of the attitude field (increasing population):

Initially, a set of 18 multiple-choice questions was developed to assess individuals' attitudes. These questions were structured in a five-choice format, ranging from "1- Completely successful" to "5-Completely disagree." After undergoing the processes of validity and reliability assessment and incorporating experts' opinions, the final questionnaire consisted of 11 questions designed to capture individuals' attitudes.

D: Questions in the field of Attitude towards legal-social and cultural contradictions:

In this study and during the formulation of the survey, a crucial aspect has been duly acknowledged, which holds significant relevance in the realm of population growth strategies. To promote the overall objectives of the system, particularly population growth, the perspective of individuals constitutes one aspect, while the stance towards the legal, social, and cultural inconsistencies exhibited by officials represents the other facet. Thus, this research also includes the measurement of people's attitudes toward legal, social, and cultural contradictions. Thirteen five-choice questions were specifically designed for this area, allowing respondents to express their level of agreement or disagreement, including 1- "Completely successful," 2- "Agree," 3- "No opinion," 4- "Disagree," 5-

"Completely disagree." After undergoing the processes of validity and reliability assessment, as well as incorporating experts' opinions, the final questionnaire for assessing individuals' attitudes towards legal, social, and cultural contradictions consisted of a total of 10 questions.

For researchers interested in exploring this field, the questionnaire used in this study can be accessed online via the provided link.

https:docs.google.com.forms.d.e.1FAIpQLScwRCxqW86Qb-F5Y4QphG7WVCMoUvTCS6k-FTtRtDD70KygsQ.viewform

6. Conclusion

This study successfully developed and validated a comprehensive and psychometrically sound instrument to assess the Knowledge, Attitudes, and Practices (KAP) of healthcare workers in Iran regarding the nation's population growth policies. The rigorous process of item generation, along with quantitative and qualitative assessments of content validity (CVR, CVI) and reliability (Cronbach's alpha, ICC), resulted in a final 40-item tool with strong validity and reliability indices. The demonstrated high internal consistency and test-retest reproducibility across all domains confirm that the questionnaire is a robust and reliable measure. The application of this validated tool in a sample of health personnel in Mashhad revealed significant insights. The findings indicate that knowledge and performance levels vary significantly based on gender and job role, with female providers and those in specific roles, such as health workers, demonstrating higher scores. Furthermore, performance was also influenced by educational attainment. These findings underscore the critical need for targeted, role-specific educational interventions and training programs to address the identified gaps and variations among healthcare providers.

The implementation of the 2021 "Law on Protecting the Family and Youth of the Population" is a pivotal national strategy aimed at addressing Iran's sub-replacement fertility rate. The success of this policy is inherently dependent on a well-informed and positively inclined healthcare workforce that is equipped to effectively counsel and guide the public. This newly developed and validated KAP questionnaire provides an essential evidence-based tool for policymakers and health system managers. It can serve as a foundational instrument for conducting large-scale assessments, designing and evaluating the impact of targeted training programs, and ultimately informing strategic decisions to strengthen the implementation of population policies. Future research utilizing this tool across different provinces of Iran is recommended to gain a more comprehensive national perspective and to refine strategic interventions further.

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References

1. Gu D, Andreev K, Dupre ME. Major trends in population growth around the world. China CDC weekly. 2021;3(28):604. https://doi.org/10.46234/ccdcw2021.160 PMid:34594946 PMCid: PMC8393076
2. Grant J, Hoorens S, Sivadasan S, van het Loo M, DaVanzo J, Hale L, et al. Low fertility and population ageing: Causes, consequences, and policy options. (No Title). 2004. https://doi.org/10.7249/MG206
3. Makinwa-Adebusoye P, editor Sociocultural factors affecting fertility in sub-Saharan Africa. Workshops on Prospects for Fertility Decline in High Fertility Countries New York: Department of Economic and Social Affairs, United Nations; 2001
4. Wang X, Cheng Z. Cross-sectional studies: strengths, weaknesses, and recommendations. Chest. 2020;158(1):S65-S71. https://doi.org/10.1016/j.chest.2020.03.012 PMid:32658654
5. Mehri N, Messkoub M, Kunkel S. Trends, determinants and the implications of population aging in Iran. Ageing International. 2020;45(4):327-43. https://doi.org/10.1007/s12126-020-09364-z
6. Kuruvilla S, Schweitzer J, Bishai D, Chowdhury S, Caramani D, Frost L, et al. Success factors for reducing maternal and child mortality. Bulletin of the World Health Organization. 2014;92: 533-44. https://doi.org/10.2471/BLT.14.138131 PMid:25110379 PMCid: PMC4121875
7. Davis K. World Population Crisis. Social Policy and Public Policy: Routledge; 2017. p. 375-88. https://doi.org/10.4324/9781315129686-36
8. Taherdoost H. Designing a questionnaire for a research paper: A comprehensive guide to design and develop an effective questionnaire. Asian Journal of Managerial Science. 2022;11(1):8-16. https://doi.org/10.51983/ajms-2022.11.1.3087
9. Taghizadeh A, Mansourizade K, Mousavi SS. Measuring the Capacity of the Family Protection and Youth Population Growth Law to Realize the General Policies of Social Security: With an Emphasis on the Issue of Childbearing. Journal of Legal Research. 2025;24(61):413-42
10. Yusoff MSB. ABC of content validation and content validity index calculation. Education in medicine journal. 2019;11(2):49-54. https://doi.org/10.21315/eimj2019.11.2.6
11. Drost EA. Validity and reliability in social science research. Education Research and perspectives. 2011;38(1):105-23. https://doi.org/10.70953/ERPv38.11005
12. McCormick K, Salcedo J. SPSS statistics for data analysis and visualization: John Wiley & Sons; 2017. https://doi.org/10.1002/9781119183426
13. Esmaeili H, Salari M, Saki A, GHOLIZADEH B, Boskabadi M, LASHKARDOST H. Comparing Odds Ratio (OR) from Fitting Independence, Marginal and Conditional Models in Analyzing the Individual Matched Case-Control Studies with Simulation Data. 2011. https://doi.org/10.29252/jnkums.3.5.S5.7
14. Vaz S, Falkmer T, Passmore AE, Parsons R, Andreou P. The case for using the repeatability coefficient when calculating test-retest reliability. PloS one. 2013;8(9): e73990. https://doi.org/10.1371/journal.pone.0073990PMid:24040139 PMCid:PMC3767825
15. Boskabadi M, Doostparast M. Regression trees with splitting based on changes of dependencies among covariates. Intelligent Data Analysis. 2021;25(3):687-710. https://doi.org/10.3233/IDA-205140
16. Abbasi-Shavazi J, Gubhaju B. Different pathways to low fertility in Asia: Consequences and policy implications. 2014