

A Study on the Relative Importance of Bottom-Up Childcare Policy for Low Fertility Measures

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Abstract: Background/Objectives: In this study, we try to examine the relative importance of the policy by analyzing the upbringing policy for early childhood education in early childhood education policy developed by Kim Byung-man through hierarchical analysis. **Methods/Statistical analysis:** The study was conducted using the AHP method. The panel of experts participated in this study has authority in the field of early childhood education and child care policy and evaluation. Twenty panelists were selected as experts in early childhood education. And the research tool used for this study is the questionnaire on the relative importance of the policy proposed by Kim, Byung-Man, who studied the bottom-up childcare policy for low birthrate measures. For the relative importance analysis, the expert panel responses were analyzed by the Expert Choice 11.5 program according to the procedures of the AHP method described in the study procedure. **Findings:** The results of the study on the relative importance of childcare policy measures for low birthrate measures are as follows. As a result of examining the simple weight of the criterion as a percentage, it was found that 31.3% of opportunities, 24.4% of services, 20.6% of cash benefits, 14.7% of goods, In order of weight. Next, we present the comprehensive weights of the policy based on the priorities, such as 'implementing mandatory parent education for parents and prospective parents' (.0660), 'expanding maternity leave for women' (.549), ' (.0442), 'Expansion of Support for Child Allowance' (.0426), 'Expansion of Support for Child Allowance' (.0501), 'Expansion of Public and Public Kindergartens and Day Care Centers' (.0418) in order of relative importance and priority.

Improvements/Applications: Through the childcare policy for low birthrate measures established in this study, we have established the grounds for helping solve the low birth rate problem in Korea. This will provide positive feedback on the establishment and implementation of measures for low birthrate in the future.

Keywords: low fertility measures, child care policy, bottom-up policy, expert, AHP method

I. INTRODUCTION

The population of the country is an important measure of the potential and power of national development. One reason for China, India and Brazil as the next generation power is because of the large number of people in the country, because manpower is a key component that leads to national power by creating knowledge and information. Population change due to declining birthrate and increasing life expectancy has become a major issue worldwide today. It is associated with

Revised Manuscript Received on January 03, 2019.

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the aging phenomenon and causes various socioeconomic problems such as loss of national growth power and imbalance among generations [1]. The declining fertility rate is becoming a major social issue because the socio-economic forecasts of the declining fertility rate and the negative results are returned. It is expected that economic growth will be slowed down due to the reduction of the economically active population, the increase of the elderly population, the weakening of the income distribution structure due to the expansion of public expenditure related to the elderly, the exhaustion of public pension funds, The aging of the labor force population, the decrease in the schooling population, and the reduction in the number of persons subject to conscription are expected [2].

The decline in the school-age population leads to problems such as exceeding the number of teachers, increasing surplus schools, overcapacity of the university, lowering the quality of higher education, but more fundamentally [3]. In this paper, we propose a new model of economic growth in Korea.

The OECD predicted that in the 2020s the growth of Europe would fall below 0.5% per year due to a decline in labor force [4]. On the other hand, we predict that China and India, which have high population growth rates, will emerge as the central countries of the world because the population growth of the country will lead to an increase in the economically active population and the economic growth rate will increase accordingly. In developed countries, the low fertility rate, which takes 150-200 years, is rapidly declining in Korea in the short term. In addition to the childbearing restraint policy from the 1960s to the late 1990s, low fertility has been on the rise due to the combination of higher education, social advancement, change in values, and economic depression. It is necessary to clarify the cause of low fertility in order to establish an efficient birth promotion policy or a family policy or social welfare policy to solve the low birth rate problem raised as a serious national task. Nevertheless, basic studies on the causes of the decline in fertility rate due to the lack of awareness of the seriousness of the low fertility problem have been insufficient. Some studies have been conducted since 2002, when low fertility problems were publicized as social issues, but most studies have focused only on the economic and social ripple effect of the low birth rate [5].

Korea's fertility rate, which has been declining recently, is extremely worrisome.



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Korea is faced with the phenomenon of the low birth rate problem, which is causing anxiety about supply and demand of future generating manpower. Thus, a multifaceted search for low fertility measures has emerged as an important issue of policy. In order to cope with the problem of low birthrate, childcare policies are being promoted by the government for the purpose of promoting economic activity, supporting work-family reconciliation, and healthy development of children as well as raising the fertility rate. Korea has failed to rebound in fertility rates despite the investment of about 60 trillion won and diverse policies in the low fertility sector during the 10 years since the first and second low birth aged society basic plan was implemented from 2006 to 2015. The Korea Institute for Health and Social Affairs pointed out that 85% of the low birthrate measures were put into childcare by the evaluation report, and the first and second basic plans were limited by the lack of balanced development due to the lack of balanced development. Korea has a low fertility rate of 1.19 as of 2015, but only 1% of its GDP is low, and 85% of it is childcare allowance [6]. Compared with the developed countries where the low fertility measures against GDP have succeeded in low birthrate, they are short of funds, and they are pointing out that they have lost the balance of the deficient budget.

In this study, Korea has a low ratio of low fertility measures to GDP, but 85% of the respondents are supporting the low birth rate. We tried to focus on bottom - up policy rather than top - down policy. We focused on the systematic acceptance and reporting of the needs and voices of the various groups' members in order to establish a childcare policy plan for low birthrate measures. In this study, we try to examine the relative importance of policy by analyzing the upbringing policy for early childhood education in early childhood education policy developed by Kim Byung-man through hierarchical analysis. The stratified analysis method is a problem-solving decision-making method that mixes subjective judgment and systematic approach to problem analysis. The stratified analysis method can be used to analyze the problem in a hierarchical manner when it is necessary to select an unclear problem, and to judge the qualitative characteristics as a quantitative judgment criterion [7]. In other words, this method can quantify the priority of the problem by converting the evaluation scale into a ratio scale [8]. In addition, more consistent and objective evaluation is possible by capturing and reflecting the knowledge, experience, and intuition of multiple expert panels [9]. The characteristics of the hierarchical analysis method have been widely applied in studies requiring simplicity and clarity of the theory, simplicity of application method, and generality of the object [10].

The relative importance of the bottom-up childcare policy for the low birth rate measures proposed in this study contributes positively to the utilization of the proposed policy and the enhancement of practicality and provides implications for the development of the childcare policy area and the quality level, And to provide meaningful data for the academic development of The following is the detailed contents of the research according to the necessity and purpose of such research.

Research content. We examine the relative importance of

bottom-up childcare policies for low birthrate measures.

II. MATERIALS AND METHODS

2.1. AHP Method

The AHP(Analytic Hierarchy process: AHP)method was proposed by Tomas Saaty, a professor at the University of Pennsylvania in the early 1970s, and is a multi-factor decision-making technique developed to improve inefficiency in the expert decision-making process of the US government. It can be explained by the decision making method that sets the importance according to the hierarchy, and it is mainly used in selecting, evaluating and predicting the decision problem, and in prioritizing the decision making alternative [11].

The AHP method allows experts to compare only the two indicators among the many indicators proposed, so that the relative importance of evaluation items can be grasped according to certain logic. In addition to the quantitative evaluation criteria that can be expressed in numerical form, it is difficult to deal with the decision problem in a practical way, but the qualitative evaluation criteria, the results can be easily and systematically derived [8]. The purpose of this study is to identify the relative importance of bottom - up childcare policies for low birthrate measures. That is, the applicability of the AHP technique is very high in light of the purpose of this study, which systematically and appropriately evaluates the bottom up childcare policy for low birthrate measures and suggests the relative importance and calculates the priority order.

The relative importance of the bottom-up childcare policy for low birthrate measures was calculated using the AHP technique, and the relativity of the pledge evaluation was confirmed. The AHP method is a multi-criteria decision model proposed by Thomas L. Saaty in 1971 and is a relative measurement-based measurement methodology through pair-wise comparison rather than absolute evaluation [11]. The AHP method generally has five steps of application.

In order to apply the stratified analysis method, the first step is to construct a hierarchy of the problem, which forms the hierarchical structure of the analysis for each analysis decision criterion.

Step 2 is 'constructing a pair comparison matrix'. In order to calculate the weight of the factors at the same level, the stratified analysis method compares two items and performs a one-to-one relative evaluation using the upper hierarchy as an evaluation criterion.

Step 3 is to verify the consistency. In order for a relative importance to have a reliable meaning, the judgment of a pairwise comparison within a hierarchy should be consistent [8]. The stratified analysis method calculates the following consistency index (CI), consistency ratio (CR) and random index (RI) to determine the significance of the weighting of the assessor [12]. - n: Number of elements, which become the comparative objects within one hierarchy

Step 4 is to calculate relative weights.



We use the eigenvalue method of Timey (2000) to measure the relative weights of decision factors. The eigenvectors are used to indicate the priority associated with the matrix. If the relative importance of n elements in the hierarchy is w_i ($i = 1, \dots, n$), then the element $a_{ij} = w_i / w_j$ ($i, j = 1, \dots, n$) of the pairwise comparison matrix can be estimated. This is expressed as a matrix and the following weight is calculated according to the eigenvalue method.

- A: Square matrix that was obtained as a result of the pair-wise comparison

- λ max: A's maximum eigenvalue

- W: Eigenvector of responding to λ max

The final step is to synthesize the priority results. After concluding the consistency check and relative weight calculation, we compute the relative weights to determine the priorities for each hierarchy and rank the decision alternatives.

2.2. Subject

Kim Byung-Man, who studied the development of evaluation criteria for early childhood education policy, adopted panel selection criterion of Delphi survey in selecting panel of AHP method [13]. According to Ziglio, the size of the sample group required to construct a professional panel is suggested to be useful for small groups of 10 to 15 people [14]. The panel of experts who participated in this study has authority in the field of early childhood education and child care policy and evaluation, and the expert panel was selected as a professor of early childhood education with a doctoral degree. As a result of the consistency of the questionnaire of relative weighting based on the AHP method, which was answered by 20 panelists, the consistency index of all respondents was less than 1.0, confirming the stability of the relative weighting analysis.

2.3. Research Tools

The research tool used for this study is the questionnaire on the relative importance of the policy proposed by Kim Byung-Man, who studied the bottom-up childcare policy for low birthrate measures [7].

Table 1: Final Research Tool

criteria	policy
1. chance	1-1. Government budget burden of Nu-ri curriculum
	1-2. Expansion of public and kindergartens and day care centers
	1-3. Expansion of childcare support for infants using daycare centers
	1-4. Expansion of care after school and care class expansion
	1-5. Obligatory parent education for parents and prospective parents
	1-6. Mandatory Child Abuse Prevention Education for Early Childhood Teachers and Parents of Infants and Young Children
	1-7. Expanding support for qualitative strengthening of early childhood education institutions
	1-8. Expansion of the workplace child care centers
2. service	2-1. Expansion of maternity leave for women

	2-2. Enforcement and expansion of parental leave of spouse
	2-3. Flexible work arrangements during childcare
	2-4. Extension of leave before and after childbirth
	2-5. Establishing a family care leave system and securing the effectiveness of family care leave
	2-6. Pregnancy - Childbirth - Postpartum cooking - Childcare - Comprehensive support system for job search
	2-7. Introduced shortening of working hours for childcare
	2-8. Introduction of maternity protection time
	2-9. Expanding child care business
	2-10. Co-parenting support
	2-11. Support for healthcare providers for mothers and newborns
	3. goods/ redemption rights/ tax cuts
3-2. Expansion of funding for surgery and treatment	
3-3. Increase family-friendly certification enterprise incentives	
3-4. Expansion of feeding expenses for infants and toddlers	
3-5. Expansion of treatment expenses for infants (including infectious diseases)	
3-6. Increase tax cuts for families with infants and young children	
4. cash benefit	4-1. Preparing pregnancy and expanding cash payment support during pregnancy
	4-2. Increased cash benefits for childbirth
	4-3. Child allowance rate increase
	4-4. Home care allowance raise
	4-5. Expanded support for universal welfare (all families) education for infants and young children
5. authority	4-6. Expanded support for educational welfare (low-income families, single parent families, multicultural families) infants and young children
	4-7. Expansion of support for improvement of treatment for early childhood teachers
	5-1. Parent insurance legislation
	5-2. Strengthen management and supervision of work and family compatibility
	5-3. Introduced a career support center system to support SME replacement personnel



- 5-4. Introduce vulnerable child support system
- 5-5. Introduced a system to expand child care support for perch

2.4. Data Analysis

The data analysis of this study is as follows. First, the weight of the AHP technique that experts panel participated in was evaluated by summing the decision values of a large number of decision makers. According to the method of utilizing AHP technique, this study also derives the geometric average value of each pair of comparisons for each item as the input matrix value. For the relative importance analysis, the expert panel responses were analyzed by the Expert Choice 11.5 program according to the procedures of the AHP method described in the study procedure. The geometric mean of all panels for each pair of comparison items was calculated, and the input matrix was generated by this, and relative importance, consistency index, and consistency ratio were derived. This study confirms the consistency of the data according to the suggestion of Saaty that the pairwise comparison matrices are consistent only when the coherence ratio is less than 0.1 [11]. The data of this study showed consistency ratio of less than 0.1.

III. RESULTS

The results of the analysis of the relative importance of the bottom-up childcare policy for low birthrate measures are shown in Tables 2 and 3 below.

Table 2: Simple Weighting Criteria

criteria	criteria weight	PCT(%)	priority
1. chance	.313	31.3	1
2. service	.244	24.4	2
3. goods/ redemption rights/tax cuts	.147	14.7	4
4. cash benefit	.206	20.6	3
5. authority	.090	9.0	5
Weighted sum	1.000	100.0	

Table 2 shows the results of the relative importance of childcare policy measures for low birthrate measures. As a result of examining the simple weight of the criterion as a percentage, it was found that 31.3% of opportunities, 24.4% of services, 20.6% of cash benefits, 14.7% of goods, In order of weight.

Table 3: Policy Simple Weights and Policy Composite Weights and Priorities

policy	ply simpleweight	ply simple wight priority	policy composite weight	policy composite weight priority
1-1.	.073	8	.0228	21
1-2.	.145	3	.0454	4
1-3.	.122	4	.0382	8
1-4.	.107	5	.0335	11
1-5.	.211	1	.0660	1
1-6.	.084	7	.0263	17
1-7.	.160	2	.0501	3
1-8.	.098	6	.0307	13
2-1.	.225	1	.0549	2
2-2.	.062	7	.0151	29
2-3.	.118	3	.0288	15
2-4.	.103	4	.0251	18
2-5.	.085	6	.0207	24
2-6.	.054	8	.0132	31
2-7.	.147	2	.0359	10
2-8.	.092	5	.0224	22
2-9.	.043	9	.0105	34
2-10.	.031	11	.0076	36
2-11.	.040	10	.0098	35
3-1.	.226	2	.0332	12
3-2.	.143	4	.0210	23
3-3.	.051	6	.0075	37



3-4.	.098	5	.0144	30
3-5.	.180	3	.0265	16
3-6.	.302	1	.0444	5
4-1.	.149	4	.0307	13
4-2.	.178	3	.0367	9
4-3.	.207	1	.0426	6
4-4.	.203	2	.0418	7
4-5.	.114	5	.0235	19
4-6.	.093	6	.0192	26
4-7.	.056	7	.0115	33
5-1.	.131	5	.0118	32
5-2.	.260	1	.0234	20
5-3.	.227	2	.0204	25
5-4.	.184	4	.0166	28
5-5.	.198	3	.0178	27
			1.000	

As shown in Table 3, when the comprehensive weights of the policies are presented based on the priorities, it is shown that 'Obligatory parent education for parents and prospective parents' (.0660), 'Expansion of maternity leave for women' (.0549), 'Expanding support for qualitative strengthening of early childhood education institutions' (.0501), 'Expansion of public and kindergartens and day care centers' (.0454), 'Increase tax cuts for families with infants and young children' (.0444), 'Child allowance rate increase' (.0426), 'Home care allowance raise' (.0418), 'Expansion of childcare support for infants using daycare centers' (.0382), 'Increased cash benefits for childbirth' (.0367), 'Introduced shortening of working hours for childcare' (.0359), 'Expansion of care after school and care class expansion' (.0335), 'Expansion of medical expenses for pregnancy and childbirth' (.0332), 'Expansion of the workplace child care centers' (.0307), 'Preparing pregnancy and expanding cash payment support during pregnancy' (.0307), 'Flexible work arrangements during childcare' (.0288), 'Expansion of treatment expenses for infants (including infectious diseases)' (.0265), 'Mandatory Child Abuse Prevention Education for Early Childhood Teachers and Parents of Infants and Young Children' (.0263), 'Extension of leave before and after childbirth' (.0251), 'Expanded support for universal welfare (all families) education for infants and young children' (.0235), 'Strengthen management and supervision of work and family compatibility' (.0234), 'Government budget burden of Nu-ri curriculum' (.0228), 'Introduction of maternity protection time' (.0224), 'Expansion of funding for surgery and treatment' (.0210), 'Establishing a family care leave system and securing the effectiveness of family care leave' (.0207), 'Introduced a career support center system to support SME replacement personnel' (.0204), 'Expanded support for educational welfare (low-income families, single parent families, multicultural families) infants and young children' (.0192), 'Introduced a system to expand child care support for perch' (.0178), 'Introduce vulnerable child support system' (.0166), 'Enforcement and expansion of parental leave of

spouse' (.0151), 'Expansion of feeding expenses for infants and toddlers' (.0144), 'Pregnancy - Childbirth - Postpartum cooking - Childcare - Comprehensive support system for job search' (.0132), 'Parent insurance legislation' (.0118), 'Expansion of support for improvement of treatment for early childhood teachers' (.0115), 'Expanding child care business' (.0105), 'Support for healthcare providers for mothers and newborns' (.0098), 'Co-parenting support' (.0076), And 'Increase family-friendly certification enterprise incentives' (.0075).

IV. CONCLUSION

In this study, the relative importance of the bottom - up childcare policy for low birthrate measures was calculated by applying the hierarchical analysis method (AHP technique) to the expert panel. Prior to obtaining relative importance, the panel's response was determined, and simple weighting and composite weighting were derived according to the criteria and policy. As a result of examining simple weights of the criteria, 'opportunity' was the highest, followed by 'service', 'cash benefit', 'goods · redemption right · tax reduction', and 'power'. As a result of examining the comprehensive weights of the policies, it was found that 'Compulsory parent education for parents and prospective parents', 'Expansion of maternity leave for women', 'Expansion of support for qualitative strengthening of early childhood education institutions' 'Increase in tax cuts for families with infants and young children', 'Non-allowance for children's allowance,' and 'Non-raising for family allowance' were high in order of relative importance and priority.

Based on the results of this study, the following implications are suggested.

First, this study intends to raise a critical discourse on the present policies approaching the low birth rate from a demographic and feminist point of view.



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We believe that the suggestion of low fertility measures that can exceed the limits of declarative and popular biased policies by converging opinions from various members' perspectives.

Second, through the childcare policy for low birthrate measures established in this study, we have established the basis to help solve the low birth rate problem in Korea. This will provide positive feedback on the establishment and implementation of measures for low birthrate in the future.

Third, the results presented in this study provided various perspectives and perspectives on the low fertility measures, and allowed us to have critical thinking about the current top - down policy promotion system. It is also expected that the current government will serve as a medium to supplement the systems and systems for implementing the policy on low birthrate policies.

Fourth, this study focused on the opinions of experts in early childhood education and childcare and suggested measures for low fertility. Through this, it is possible to secure a place for various groups' participation, intervention and communication in establishing and practicing low birthrate measures.

In this study, research method based on AHP technique was conducted for early childhood education policy and evaluation specialists, early childhood education administration specialists, and early childhood education field specialists. This research method should lead to the generalization of the results of the research, but the survey is limited to a limited number of areas, which limits the generalization. However, this study suggests that it may not be a problem even if it is confined to a certain region because it has the characteristic of research study for experts [15].

ACKNOWLEDGMENT

This work was supported by the National Research Foundation of Korea Grant funded by the Korean Government(NRF-2017S1A5A8022905).

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