

Analysis of Trends in Willingness to Pay Research in Healthcare Service of Korea

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Purpose: This study was to review the previous studies on the 'Willingness to Pay (WTP)' for healthcare services and suggest future implications for nursing research. **Methods:** Using the scoping review method, we used RISS, KISS, KMBase, Koreamed, PubMed, EMBASE, CINAHL as searching engines. According to the selection and exclusion criteria, 40 appropriate studies were selected and analyzed. **Results:** 24 studies were categorized into medical service field among medical, public health, and nursing service fields. A total of 16 studies were related to healthcare system (policies), 13 studies were to the healthcare intervention, and 11 studies were categorized into the health management. Most of the methods for eliciting WTP (70%) were about a contingent valuation method (CVM), and the use of double bounded dichotomous choice (DBDC) tended to increase. In the nursing field, five WTP studies were identified: two studies published in the early years of 2000, which were conducted on hospital-based home health visit services. Recent studies were mostly about counseling and education by advanced practice nurses (APNs). **Conclusion:** WTP studies on healthcare services were largely published from the medical fields and health policy areas with the CVM method. In the field of nursing, studies have been conducted on the subject of limited service areas. More active exploration of research topics is required, particularly under the current policy setting, where discussion of the public health insurance fee for nursing practice is essential.

Key Words: Health services needs and demand; Social values; Nursing

INTRODUCTION

1. Background

Nursing services have been traditionally regarded as free services included in medical services, so price competitions in nursing have been deemed to be unethical [1]. Even today, although a large part of medical services is performed by nurses, there are not many cases in which nursing services are classified as independent services and costs of the services are estimated or set. However, in modern society, health care services have been continuously growing with the development of scientific technologies, and medical needs have become diverse and complex due to demographic aging and socioeconomic changes, so the

diversification and professionalism of services are also required in nursing as in other fields. Currently, nurses are trained professionals who have acquired systematic theories and skills and can fulfill health care needs. Therefore, nursing services include costs of training and maintenance of nursing workforce along with service production costs, so it is necessary to estimate costs for qualitative and quantitative contributions and expertise of nurses providing healthcare services [2]. In Korea, healthcare service costs are based on the price setting of the national health insurance system. Therefore, setting the costs of nursing services necessarily involves efforts to include relevant services at appropriate prices in the fee schedules of the national health insurance system.

In general, service costs are composed of monetary val-

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ues and non-monetary elements. The costs of most health care services are measured by the human capital approach, and direct and indirect monetary values are reflected. The present fee schedule of the national health insurance system consists of the resource based relative value scale (RBRVS), and RBRVS are determined based on the workload of main service workforce and the degree of hazards in the workplace [3]. However, the human capital approach does not accurately reflect the values of healthcare services since it does not include intangible values, such as social and psychological costs and benefits of healthcare consumers arising from diseases, and the proportion of intangible values is relatively larger in the case of healthcare services, so an accurate assessment method is needed [4]. Since public services such as healthcare services are not traded in a market, it is very difficult for healthcare consumers to measure and evaluate the effects of services, so the method of identifying consumers' preferences for the needs and demand for healthcare services by a direct survey of willingness to pay (WTP) is mainly used [5].

WTP refers to the maximum amount of money that a consumer is willing to pay to reduce the risk of getting or contracting a disease [6] and it has the advantage of idealistically measuring the value of a product or service by quantifying both the tangible and intangible values of goods in currency. In foreign countries, WTP research is a concept that existed for quite a long time, and WTP studies in the field of healthcare services started in the 1970s and have been continuously carried out since then [7,8]. In Korea, WTP research in healthcare services began in the field of nursing in the late 1990s. A study on the intention to use home health care in patients after hospital discharge published in 1999 investigated whether subjects have the intention to pay or not [9], and a study published in 2001 proposed a pricing policy reflecting the subjective value of consumers by applying the willingness to pay approach to the estimation of nursing service costs [1]. Since then, WTP research has been expanded to the fields of medical services and public health. However, there have not been many WTP research attempts in the field of nursing since the introduction of the studies. In health care services, reasonable allocation of limited resources is required. In modern society, very rapid technological development along with social and economic changes is leading to the continuous expansion of the area of health care services, and economic analysis to evaluate the social value for reasonable payment are gradually taking on greater importance [10]. This study attempted to examine WTP studies conducted in Korea to investigate the economic value of healthcare services perceived by consumers and analyze

the research trends with a view to presenting useful basic data for finding directions for research with a willingness to pay approach in the field of nursing in the future.

2. Purpose

This study aimed to conduct a comprehensive review of trends in domestic studies applying WTP in the field of healthcare services in order to present the analysis results as reference data that can be applied and expanded to nursing policies and services in the future. The specific objectives of this study are as follows:

- to identify the general characteristics of WTP studies in healthcare services;
- to examine the status of each research field and area of WTP studies in healthcare services by year of publication;
- to investigate methods for deriving WTP and analysis methods in healthcare services.

METHODS

1. Study Design

This study aimed to investigate the research trends in domestic studies on WTP in healthcare services and explore the status of research in the field of nursing. To review studies to investigate consumers' preferences and values regarding healthcare services and systems, this analysis was conducted by referring to the scoping review approach.

2. Study Procedure

This study was carried out according to the sequential steps of the scoping review framework proposed by Arksey and O'Malley [11].

1) Stage 1: Identification of the research question

The scoping review needs research questions for literature review as in a systematic literature review. In addition, to get a broad understanding of the research scope, a research question should be set as a broad question in scope [11]. Therefore, the research question of this study was set as 'What are research trends and research areas in Korean WTP studies in the field of healthcare services?'

2) Stage 2: Relevant studies

To find articles relevant to the research question, a comprehensive literature search is required. To select relevant

articles among domestic studies published in foreign journals as well as those published in domestic journals, both domestic and foreign databases were searched. Domestic databases used for this study were RISS, KISS, KMbase and KoreaMed, and foreign databases used were PubMed, EMBase, and CINAHL. In searching domestic databases, Korean words for willingness to pay, intention to pay, and intent to pay were considered as key search terms, but since domestic articles also included English titles, 'willingness to pay' and 'willing to pay' were used as search terms, and the search strategy was completed by using 'nursing', 'medicine' or 'healthcare' in combination with the above-mentioned search terms to extract studies in the field of healthcare services. In searching foreign databases, "willingness to pay" and "willing to pay" and "health", "medicine", and "nursing" were searched as MeSH terms and text terms using a truncated term were employed, and in order to limit retrieved studies to research related to Korea, the terms 'Korea' and 'Korean' were also used as search terms. Since most WTP studies in Korea were published since 2000, literature searches were carried out without limiting the year of publication (search date: July 28-29, 2020).

3) Stage 3: Study selection

In the study selection stage, studies relevant to the research question are extracted and selected, and irrelevant studies are excluded. To maintain consistency in the study selection process, inclusion and exclusion criteria were determined according to the research question. The inclusion criteria were research on health care services, such as healthcare policies or systems, disease treatment and prevention, and health management, original articles published in peer reviewed journals, and studies published in Korean or English. The exclusion criteria were studies not conducted with Koreans as subjects in Korea, studies not related to healthcare services, studies that do not include the full text (abstracts and presentation materials of academic meetings), studies which did not directly survey the subjects regarding WTP, theses and dissertations, research reports and review studies.

4) Stage 4: Charting the data and summarizing and reporting results

The data charting stage is the step of extracting the data of selected studies and logically summarizing the results pertinent to the review purpose and research question to increase the understanding of readers. Therefore, to chart the data of studies in diverse fields and areas of healthcare services, based on the data extraction form recommended

by Arksey and O'Malley [11] and Peter et al. [12], this study attempted to summarize and report the review results by deriving characteristics, such as the author, publication year, research purpose, subjects and the sample size, and research methods such as methods for deriving WTP and data collection methods, in consideration of the review purpose and research question.

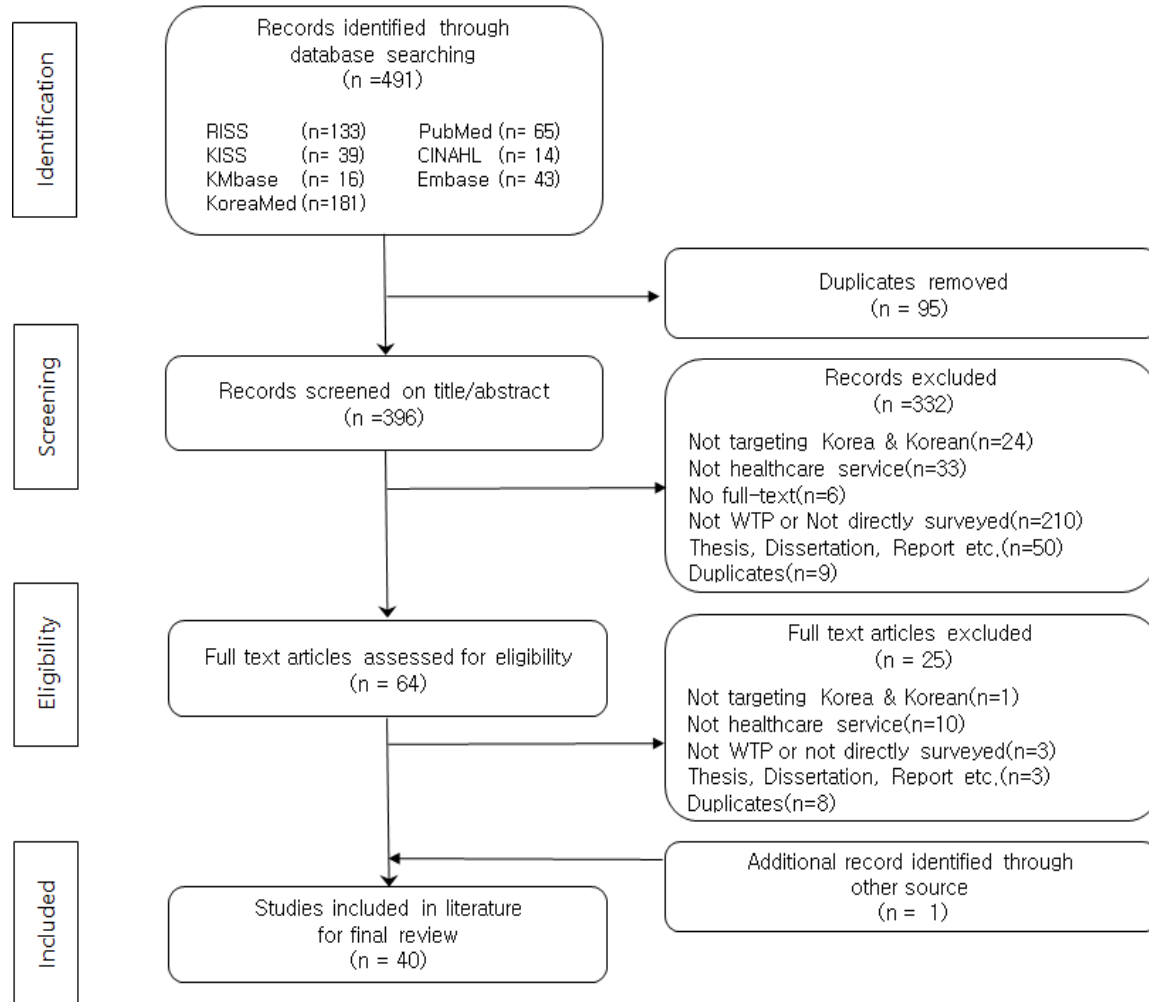
RESULTS

1. Study Selection

A total of 40 studies were finally selected for this study. Initially, a total of 396 studies were extracted from domestic and foreign databases through the de-duplication process of removing duplicates from search results. The study titles and abstracts were first reviewed and this process was carried out according to the selection criteria. Theses, dissertations, and research reports were excluded during the first screening process. During the second selection process, after the full texts were obtained, selection and exclusion were made based on the content of the main text, and one study was included by hand searching. In the study selection process, studies which dealt only with intention to WTP were also included. Studies on the environment and health, health information data (personal health records), or mobile devices for health care services were not included (Figure 1).

2. General Characteristics

A total of 40 studies were selected for this study. They were published during the period from 1999 to 2020, and they consisted of 38 studies of willingness to pay (WTP) and 2 studies of willingness to accept (WTA) on healthcare systems or policies, medical interventions, disease treatment including therapeutic medicines or devices, disease prevention, and public health services or resources. The list and characteristics of selected studies are presented in Appendices 1 and 2. The studies analyzed in this review were cross-sectional studies to estimate the participants' perceived economic values and preferences for healthcare services. The selected studies included two studies which measured WTP as a component of exploratory research on the experience of using services, satisfaction with them, or intention to use services and three economic evaluation studies to measure benefits and the threshold of cost-effectiveness analysis. The question used for estimating WTP for services is generally an open-ended question which directly asks the price or requires respondents to present the



WTP=Willingness to pay.

Figure 1. Flow diagram of the study selection process.

reference price or the first bid price. Among studies which used techniques other than open-ended questions and did not present a specific price, one study examined willingness to pay for the price being co-payment and two studies asked respondents to select or present an additional cost as x% of the price currently paid for services. In addition, two studies investigated only whether the subjects were willing to pay or not without examining the specific price that the respondents were willing to pay.

3. Trends in WTP Research in Healthcare Services

Table 1 shows the fields and areas of WTP studies. When classifying studies according to the fields of healthcare services, studies whose field was difficult to define definitely were classified as those in medical services. As a result, among the selected studies, 24 studies were classified

as researches in medical services, making up the largest proportion. In addition, seven studies in public health and five studies in nursing were included in this study. In terms of the publication year, it was found that the number of studies has been increasing since the late 2000s. Regarding specific research areas, research areas were divided into healthcare systems or policies, interventional services for disease treatment or prevention, and health management for health and disease management. There are 16 studies in the area of healthcare systems (policies), which are related to the introduction of new policies (systems) by period. As for research in the area related to direct interventions, 13 studies, including seven articles on medical services and four articles on educational and counseling services, were included. In the area of health management, 11 studies on disease prevention, health status improvement, or drug management programs were included.

Table 1. Fields of the Reviewed Researches

Items	1999~2005	2006~2010	2011~2015	2016~2020	Total
Medical service	1	7	9	7	24
Healthcare intervention	1	2	2	4	9
Counseling (education) service	(1)			(1)	(2)
Disease treatment or symptom relieve		(2)	(2)	(3)	(7)
Healthcare management		3	3	1	7
Disease related service		(2)	(2)		(4)
Health improvement service		(1)	(1)	(1)	(3)
Healthcare system (policy)		2	4	2	8
Emergency service				(1)	(1)
Expansion of coverage			(2)		(2)
Home-visit service		(1)		(1)	(2)
Hospice care service			(1)		(1)
Telemedicine		(1)	(1)		(2)
Public service	2	4		1	7
Healthcare management	1				1
Public healthcare service	(1)				(1)
Healthcare system (policy)	1	4		1	6
Cancer screening (female)		(1)			(1)
Long-term care insurance	(1)	(3)			(4)
National preventive home visit				1	(1)
Nursing service	2	1		2	5
Healthcare intervention				2	2
Counseling (education) service				(2)	(2)
Healthcare management		1			1
Health improvement service		(1)			(1)
Healthcare system (policy)	2				2
Home-visit service	(2)				(2)
Dental service			1	1	2
Healthcare intervention			1	1	2
Dental preventive service			(1)	(1)	(2)
Pharmaceutical service		1		1	2
Healthcare management		1		1	2
Pharmaceutical management		(1)		(1)	(2)
Total	5	13	10	12	40

The examination of WTP studies by year of publication by dividing the years of publication into 5-year periods showed that although only 5 studies were published before 2006, the number of WTP studies was increased to 10 or more during each subsequent 5-year period. Regarding methods for deriving WTP, the method for deriving a WTP is to provide a general survey, a content valuation method (CVM) that utilizes virtual scenarios and a multi-attribute valuation method which require respondents to make choices between several attribute alternatives in-

stead of directly asking them to report the monetary values of relevant services, were employed. Out of the three methods, CVM was used in 28 studies (70.0%). Between 2006 and 2010, 13 studies were conducted by various approaches. Regarding the survey techniques of CVM, open-ended (OE) questions, bidding games (BID), referendum questions, and dichotomous choice (DC) questions were applied. The OE question method has been used since the introduction of WTP research, and it was used alone or in combination with other techniques to derive

WTP. BID was applied in seven studies before 2015. The DC question approach was used in 15 studies, out of which 12 studies employed double bounded dichotomous choice (DBDC) questions. Studies using DBDC questions accounted for the largest proportion, and the use of DBDC questions has been recently increasing. In 5 studies which applied the multi-attribute valuation method, conjoint analysis and the choice experiment method were used. Seven survey studies were identified (Table 2).

Table 3 shows the status of the study population in the selected articles. 20 studies were conducted with the general population, while 20 studies specified participants as a particular demographic group. 17 out of the 20 studies

were conducted with patients, and the participants of the other 3 studies were patients and their guardians, caregivers of patients, and participants in an interventional program, respectively. As for the studies conducted with the general population, the sample size was over 500 in 14 studies, and 4 out of the 14 studies were conducted with 1500 or more people. In the case of the studies of patients, the sample size was 500 or less in 18 studies.

With respect to data collection methods, data collection was carried out by interviews in 27 studies, by a self-report survey in 8 studies, and by interviews and a self-report survey according to the participants in 1 study. As to interview methods, face-to-face interviews and telephone in-

Table 2. Methods of Willingness to Pay Elicitation

Variables	1999~2005	2006~2010	2011~2015	2016~2020	Total
CVM	2	13	6	7	28
OE		1	1	1	3
OE & Referendum		1			1
OE, BID, Referendum	1				1
BID	1	3			4
BID & OE		1	2		3
DBDC		3	2	5	10
DBDC & OE		1		1	2
SBDC		1			1
SBDC & OE		1	1		2
No mention		1			1
Multi-Attribute valuation method	1		3	1	5
Conjoint analysis	1		1		2
DCE			2	1	3
Survey	2		1	4	7
Total	5	13	10	12	40

CVM=contingent valuation method; BID=bidding game; OE=open-ended question; DBDC=double bounded dichotomous choice; SBDC=single bounded dichotomous choice; DCE=discrete choice experiment.

Table 3. Subjective Status of Included Studies

Variables	1999~2005	2006~2010	2011~2015	2016~2020	Total
General population	3	5	4	8	20
100 or less		1			1
101~250			1	1	2
251~500	1	1	1		3
501~750	2		1	4	7
751~1,000		1		2	3
Over 1,500		2	1	1	4
Patients (or targeted)	2	7	7	4	20
100 or less	1	3		1	5
101~250	1	2	3	2	8
251~500		2	3		5
501~750			1	1	2
Total	5	12	10	12	40

interviews were used in 24 studies and 3 studies, respectively. Self-report methods included the method of data collection by a web-based survey using the Internet. Data collection methods were not clearly specified in 4 studies (Table 4).

The data analysis methods consisted of descriptive statistics to summarize data, identification of factors influencing WTP, and the estimation of WTP for closed questions. The independent variables for identifying influencing factors included the general characteristics of participants (demographic and socioeconomic variables), health status and disease conditions related to the research subject, and variables specific to the research subject. The probit model and survival analysis were applied to estimate WTP. Logistic regression analysis was used to identify factors influencing intention to WTP, and linear regression analysis, including simple linear, multiple linear, and multivariate regression analysis, were performed to determine the relationship between independent variables and the dependent variable, WTP. In some studies, t-test, ANOVA, χ^2 test, and correlation analysis were also conducted to compare differences between groups for the dependent variable.

4. WTP Studies in the Field of Nursing

Five WTP studies in nursing were found in this study. Regarding the year of publication, they were respectively published immediately before and after 2000, in 2010, in 2019, and in 2020. With respect to the research subject, they were composed of a research on early home visiting nursing services, a study conducted to present the policy suggestion that the intangible values of consumers should be reflected in the price setting of nursing services, a research on cognitive enhancement programs for older people, and

a study of the telephone education and counseling services of advanced practice nurses (APNs) on the nursing of critically ill patients and self-care of breast cancer patients. As for the study population, in studies published before 2011, participants were patients (or their family) or older people who participated in a program, while studies published since 2011 were conducted in the general population. In both the two studies of the general population, the sample size was 500 or more. To derive WTP, CVM was applied in 4 studies published since 2000. Among them, Ko & Park [1] examined differences between the results obtained using OE question, BID and referendum question techniques. Lim et al.[13] used the OE question technique in combination with the referendum question. Studies conducted after 2019 employed DBDC questions. As for the survey methods, face-to-face interviews were used in 2 studies, and a web-based data collection method was used in 2 studies, but the data collection method was not specified in 1 study (Appendix 2).

DISCUSSION

This study is a literature review to analyze WTP studies in the field of healthcare services conducted in Korea, such as WTP studies on disease prevention and treatment or policies for health improvement. The selected studies for this study were published from 1999 to July 2020, and a total of 40 studies were analyzed in this study. With respect to the research fields, 24 studies in medical services were included, making up the largest proportion, and in the case of studies in health care policies, interventions and health management, each area accounted for a similar proportion. In terms of the research areas of healthcare services, the proportion of studies on policies (16 studies) was found to be relatively high. This is considered to be

Table 4. Methods of Data Collection

Variables	CVM	Multi-attribute valuation method	Survey	Total
Interview	21	3	3	27
Face-to-face	18	3	3	24
Telephone survey	3			3
Self-reported	3	1	4	8
Self-reported	1		3	4
Web-based survey	2	1	1	4
Interview & self-reported	1			1
Face-to-face & Web-based survey	1			1
Total	25	4	7	36 [†]

CVM=contingent valuation method; [†] Four studies do not clearly describe the data collection method.

due to the fact that research was conducted during the process of introduction or preparation of health care-related policies such as policies for home visiting health services, long-term care insurance for older people, tele-medicine, and expansion of health insurance coverage of cancer patients. In relation to the results of selected studies, 36 studies analyzed WTP, two studies investigated only whether respondents are willing to pay or not, and two studies analyzed WTA. WTA is the minimum amount of compensation necessary for the recipients to give up benefits or accept losses, and tends to be greater than the estimated WTP for the same good. So it is reported that it is rarely applied to the health care sector [7]. With respect to the trends in domestic WTP research, there was no rapid quantitative growth of research in overall areas, but research on the healthcare systems or policies has been steadily carried out, and research areas have been expanded over time, showing that research has been continuously conducted.

In Korea, interest in WTP as a measure of health benefits in economic evaluation in the field of healthcare services has been increased especially since 2000. Related studies have the advantage of evaluating benefits in monetary units based on preferences for health outcomes with an approach suitable for the theories of welfare economics. WTP studies collect data among patients or the general population according to the policy context. Healthcare services are operated by taxes, health insurance premiums, and payments directly made by medical consumers, and decision makers are faced with the limitations of resources in expanding or introducing health care services. Therefore, WTP research is conducted to support the decision-making process for the efficient distribution of limited resources by measuring the values of patients or the general public according to the social context [14]. The methods of estimating WTP is largely divided into the revealed preference method, which is the method of estimating WTP with existing market data, and the stated preference method based on the responses (statements) obtained by directly asking respondents a question. The stated preference method is an intuitive and clear method since it specifies the study population accurately and estimates the values of participants using a survey, and CVM and the multi-attribute valuation method are representative stated preference methods. CVM can estimate the total value of a product or service by presenting a hypothetical market situation for a specific product or service, but the multi-attribute valuation method is the technique of deriving a value by the change in the level of an individual attribute by combining multiple attributes of public goods

without directly inquiring about the monetary value of goods [15].

70% of the studies included in this review derived WTP by CVM, and the survey methods used for data collection were OE, referendum, BID, and DC questions. The OE question method is simple but has problems such as non-responses or protest zero responses and a large range of prices given by respondents. The BID technique can lead to more accurate results compared to OE by repeating a question according to the response option (yes or no) selected by respondents but the starting point bias may occur due to the first presented value. The referendum method, which uses a 'yes' or 'no' response to a question presenting a specific price, requires a relatively large sample size and has the disadvantage that it does not allow the identification of the response tendency of individual respondents. Closed questions, including DC questions, have the disadvantage such as eliciting few responses of paying more than the first presented price and require a larger sample size and greater efforts compared to open-ended questions. In general, CVM inherently has the hypothetical bias due to the motivation for the response of willingness to pay according to a hypothetical situation and the strategic bias of underreporting willingness to pay [1,16]. Thus, characteristically, this method involves the risk of errors and biases in the design of the hypothetical situations, sample, and survey process, and may lead to the derivation of different survey results according to the survey method.

Among the CVM techniques, the DC question format, which requires respondents to answer yes or no to the presented price, is similar to the way of purchasing goods in a real market or the process in which residents vote for or against something, is considered a method by which respondents' preferences for relevant services can be accurately expressed [17], so it is a method recommended by the guidelines of the National Oceanic and Atmospheric Administration (NOAA) [18]. Since DBDC questions allow a more efficient analysis of responses than single bounded double choice (SBDC) questions, which are the method of asking a question only once, this technique is widely used [19]. In Korea, surveys using DBDC questions have been increasing, and the analysis results of this study showed that the number of studies using them was increased from four studies before 2011 to eight studies since 2011. In addition, it was found that the sample size was increased accordingly since the DBDC question method requires a larger sample size compared to the OE question technique. To increase respondents' understanding of hypothetical scenarios, face-to-face interviews are recommended

as a desirable survey method [18]. A recent tendency in studies using surveys is the use of web-based online surveys. Since there are no statistical differences between the results of online surveys and those of face-to-face interviews and online surveys have the advantages of saving the survey time and costs, they are currently used in research [20]. Therefore, to estimate the appropriate values of study subjects for healthcare services, it is required to comply with the recommendations of the NOAA and to reasonably construct and design scenarios and surveys so that respondents can easily understand the hypothetical situation and problem. In addition, efforts are needed to minimize errors and biases by controlling the research sample, sample size, and the process of conducting the research so that accurate results can be derived according to the research method.

The estimation of WTP is carried out using regression analysis or a nonparametric method [16], and analysis methods have been recently becoming more precise. In the selected studies of this study, there were cases where probit regression analysis was applied to estimate the price for the yes-no DC question or survival analysis was applied by treating values as truncated data because it was not possible to know the highest or lowest price intended by respondents. In the study using OE question, logit analysis was conducted to analyze the factors affecting the intention for WTP, and in order to explore the factors affecting WTP, Tobit analysis was applied to minimize data omissions by treating WTP of "subjects who do not intend to pay" as censored data. In general, the relationship between intention to WTP and an independent variable is analyzed by logistic regression analysis, and the relationships with the independent variables affecting the price are analyzed by regression analysis according to the characteristics of data. Therefore, for accurate estimation of prices, it is important to select appropriate statistical analysis methods by identifying the characteristics of data in consideration of the method of deriving WTP.

Only five domestic studies in the field of nursing were included in this review. This is due to the fact that an inclusion criterion was research on healthcare services, and only studies on services clearly performed by nurses were classified as researches in nursing. Among the studies excluded during the selection process were three studies which investigated nursing college students' preferences for medical institutions [21], hospital nurses' preferences for medical institutions among nurses [22], and preferences for the nurse clinical career development system of tertiary general hospitals among nurses [23], respectively. The three excluded studies were also published after 2016.

Among them, two studies related to medical institution preferences derived the estimated prices by applying the discrete choice experiment (DCE) method, and the study on the clinical career development system applied CVM and the DBDC question method. WTP studies provide decision makers with recommendations on the efficient allocation of resources. In the field of nursing, research that can contribute to hospital management is also conducted by analyzing preferences among nurses or future nurses in healthcare services. This is considered an indication of growing interest in WTP analysis in the field of nursing in the past five years.

However, the examination of trends of research in nursing related to healthcare services revealed that there were only two studies on hospital-based home care services published around 2000 in the case of research on healthcare policies and there were two studies related to nursing services. The two studies on nursing services were published after 2018 and dealt with the education and counseling of APNs. As described so far, in the field of nursing, there has been a small number of WTP studies related to service policies and nursing interventions, and research tended to be concentrated in specific time periods and research subjects. The introduction and application of healthcare policies require multidisciplinary collaboration of diverse professional fields, so an approach for proper valuation of services at the time of policy introduction or regarding currently implemented policies can be taken in nursing as in other fields. In addition, in the field of nursing, efforts for the development of nursing interventions classification (NIC) and core nursing interventions for the price setting of the fee schedule of the national health insurance system for nursing services have been made [24]. Furthermore, there have been efforts to develop and improve nursing fees to reflect them in policies and improve the existing fee schedule, such as the exploration of nursing services currently classified and reflected in the fee schedule for nursing services [25,26] and survey to improve the fee schedule for nursing services [27]. With respect to price setting for nursing services, it is important to estimate optimal price and it is necessary to set reasonable prices reflecting the tangible value of the service together with the intangible value of the service of consumer. To reflect intangible values, well-designed WTP studies should be conducted so that respondents can understand the services correctly and give appropriate values to them. In relation to the costs of healthcare services, the field of nursing still has yet to deal with many tasks. There are only a few nursing services for which health insurance costs can be calculated, and the pursuit of diversity and pro-

professionalism in modern society is expected to lead to the development of professional nursing services. Therefore, efforts to reflect appropriate values of nursing services through WTP studies are needed in setting prices for core nursing services classified so far and in introducing nursing policies or services in the future.

CONCLUSION

This study is a literature review to analyze research trends and methods of studies published in peer reviewed journals by publication year and research area in order to examine the status of domestic WTP research in the field of healthcare services, and this study has some limitations. First, there is a possibility that the researcher's biases intervened in searching and classifying studies, and there is also a limit to consistency. This is because the healthcare service field consists of collaboration in various specialties rather than in cases where the boundaries of the area are clear. Second, a comprehensive search for WTP studies was carried out but some studies may have been missed. For example, WTA studies are included among WTP analyses, and although literature search was conducted by setting a comprehensive literature search strategy, WTA was not included among the search terms for narrowing search, so a sensitive search for related terms was not carried out during the search process.

This study analyzed 40 WTP studies in healthcare services conducted in Korea to investigate the research trends. The analysis results showed that in terms of the fields of healthcare services, the majority of selected studies were researches in medical services. Regarding the research area, studies on the healthcare systems or policies were found to make up the largest proportion. CVM was used in most selected studies, and research using DBDC was shown to be increasing. In the field of nursing, five WTP studies were identified, and WTP research in nursing tended to be limited in scope in terms of research time and subjects. It is thought that these study findings can serve as the basis for the methodology for establishing the appropriate fee schedule at the introduction of nursing policies or nursing services into the healthcare system by clearly recognizing the method for evaluating intangible values in the determination of appropriate prices of nursing services. Therefore, to provide policy-level support including nursing services in the policies about health care services, there is a need to increase research participation through the recognition of the role of the field of nursing and activate research to identify consumers' preferences and values by investigating priorities of the nursing services for

which appropriate prices need to be set.

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Appendix 1. List of Included Researches

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Appendix 2. Characteristics of Included Researches

Author	Aims/Purpose	Subjects		WTP [†]	WTP Elicitation	Data Collection	Analysis	Variables [§]	Results
		Subjects	No						
Kim CO et al. (2020)	To assess WTP for physician home visits among the community- dwelling Korean older population.	General population	797	WTP	CVM	Face-to-face	Logit & tobit regression	Health related service utilization	Mean WTP & Influencing factors
Ko JM [†] et al. (2020)	To evaluate the monetary value of telephone-delivered follow-up education for patients with breast cancer provided by advanced practice nurses (APNs).	General population	570	WTP	CVM	Web-based	Logit model	Family history of breast cancer Awareness of APNs	Median WTP & Influencing factors
Ko JM [†] et al. (2019)	To estimate the economic value of a family education and counselling service provided by critical care advanced practice nurses (APNs).	General population	615	WTP	CVM	Web-based	Probit model	Demographic variable	Median WTP & Influencing factors
Choi HS et al. (2018)	To find policy preferences of citizen groups in the public services with increasing importance.	General population	1,966	WTP	CVM	-	-	Political preference	WTP & Influencing factors
Kim AR et al. (2018)	To elicit the WTP for counselling services and to analyze factors that influence WTP.	General population	561	MWTP	CVM	Face-to-face	Survival analysis	Physiological variable	Mean MWTP & Influencing factors
Kim HN et al. (2018)	To identify the demand and WTP for oral hygiene services among elderly people with long term care.	Patients	126	WTP (demand)	Survey	Face-to-face	Descriptive analysis, χ^2 test	Service demand	Service demand
Kim SY et al. (2018)	To investigate the athletes' medical service experience, the importance of each service recognized by athletes, the WTP for each service.	Patients	100	MWTP	Survey	Face-to-face	Mann-Whitney U test, Spearman's correlation	Experience, satisfaction	MWTP & related factor
Ko SJ et al. (2018)	To analyze service user's benefit and perceived-outcomes of visiting healthcare.	General population	1,000	WTA	CVM	Telephone	(Maximum likelihood Estimation)	Service, Quality, satisfaction	Satisfaction Benefit (WTP)
Song HJ et al. (2018)	To evaluate WTP for 1 QALY for a cure using the Korean general population and confirm the critical factors affecting WTP.	General population	507	WTP	CVM	Face-to-face	t-test, ANOVA, Multivariate regression	Disease status	WTP & Influencing factors
Kang JE et al. (2017)	To assess the degree of satisfaction, expressed needs of pharmaceutical care services in patients with chronic diseases and explore the factors r/t to the needs.	Patients	220	WTP (demand)	Survey	Face-to-face	Univariate analysis, ANOVA, Logistic regression	Satisfaction, Expressed needs, Duration, Method,	WTP demand & Influencing factors
Lee CH et al. (2017)	To evaluate new patient's satisfactory consultation time (SCT) and their WTP additional costs (WPAC) for their SCT.	Patients	612	MWTP	Survey	Self-reported	t, χ^2 test, Multi logistic & Multi linear regression	Hospital outpatient treatment, Satisfaction	Pt's satisfactory consultation time MWTP for SCT
Lee JY et al. (2016)	To explore and quantify patients' preferences of advanced ovarian cancer patients for adding bevacizumab to first-line therapy.	Patients	102	MWTP	Multi-attribute valuation method	Face-to-face	Random effects probit regression	4 attributions Additional trade-off	Preference, MWTP & Influencing factors
Cho DH et al. (2015)	To investigate MWTP of the people for the increased coverage of liver cancer treatments.	General population	600	MWTP	Multi-attribute valuation method	-	(Random utility model) Mixed logit analysis	4 Attributions	MWTP for insurance premiums
Kim EJ et al. (2014)	To analyze inherent value and factors which influence WTP of vasomotor symptoms treatment	Patients	657	WTP	CVM	-	Multiple, Logistic regression	Management of the syndromes	Mean WTP & Influencing factors

[†]Literatures of nursing field; [†]MWTP: Marginal WTP for additional costs; [§]Variables other than demographic variable; WTP=Willingness to pay; CVM=Contingent valuation method.

Author	Aims/Purpose	Subjects		WTP [†]	WTP Elicitation	Data Collection	Analysis	Variables [§]	Results
		Subjects	No						
Park KH et al. (2014)	To arrive at reasonable and realistic prices for professional tooth cleaning (PTC).	Patients	241	WTP	CVM	Self-reported	ANOVA, t, χ^2 test, Multiple regression	Health behavior, Satisfaction	Satisfaction, WTP & Influencing factors
Jo CI (2013)	To figure out the characteristics of the decision-making for cancer treatments and investigates the attributes affecting the respondents' choice	General population	3,600	MWTP	Multi-attribute valuation method	Web-based	Nested-logit model (Fixed-effect model)	4 Attributions	MWTP & Influencing factors
Rhee HC (2013)	To estimate WTP to avoid infection of tsutsugamushi disease	Patient & control	345	WTP	CVM	Face-to-face	-	Awareness disease Understanding burden	Mean WTP & Influencing factors
Lim HS et al. (2012)	To investigate the WTP for intravenous patient controlled analgesia (IVPCA) and the relationship between characteristics of patients and WTP	Patients	400	WTP	Survey	Self-reported	χ^2 , Spearman rank order correlation test, Linear regression	Health variables (pre-experience)	Median WTP & Pt's characters for WTP & IVPCA satisfaction
Oh DY et al. (2012)	To evaluate the inherent value of breast cancer therapy a WTP study with metastatic breast cancer	Patients	199	WTP	CVM	Face-to-face	M \pm SD, Linear regression	Health status, Utility	Average WTP & Influencing factors
Kim MO et al. (2011)	To determine WTP for hospice care and to analyze those factors affecting WTP	General population	500	WTP	CVM	Face-to-face	Survival analysis	Recognition of the service	Mean WTP & Influencing factors
Park HY et al. (2011)	To explore patients' valuations and preferences for telemedicine service for diabetes management and evaluate patient WTP	Patients	118	MWTP	Multi-attribute valuation method	Face-to-face	Rank ordered logit model	Disease state, Preference	MWTP & Influencing factors
Park JY et al. (2011)	To estimate WTP for treatment which reduces osteoporotic fractures	General population	101	WTP	CVM	Face-to-face	(Generalized Linear Model)	Health & Disease status	Average WTP & Influencing factors
Kim YH et al. (2010)	To search for cost-effectiveness threshold in Korea using EQ-5D for QALY and WTP in hypothetical scenarios	General population	100	WTP	CVM	Face-to-face	-	Health & Disease status	Average WTP & Influencing factors
Lim JY [†] et al. (2010)	To gauge the social WTP for cognitive enhancement program for elders	Targeted elderly	77	WTP	CVM	Face-to-face	Frequency, M \pm SD, Multiple regression	Effect of the program (Health status, QoL)	Mean WTP & Influencing factors
Chung SH et al. (2009)	To assess the amount patients WTP for a hypothetical antiemetic to completely prevent postoperative nausea and vomiting.	Patients	86	WTP	CVM	Face-to-face	Median, Univariate, Logistic & Multivariate linear regression	Anesthesia, Symptoms	Median WTP & Influencing factors
Kang HJ et al. (2009)	To measure the patients' WTP for the Medication Therapy Management Service.	Patients	33	WTP	CVM	Face-to-face	Frequency, χ^2 test, Logistic regression	Patient's opinion (need)	Mean WTP & Influencing factors
Rhee HC et al. (2009)	To estimate of WTP for avoiding infection of Tsutsugamushi disease	Patients	300	MWTP	CVM	Face-to-face	-	Perception about risk Disease	Marginal WTP & Influencing factors
Shin HJ (2009)	To estimate the Willingness-To-Accept (WTA) of the cash subsidy for informal family caregivers in long-term care insurance	Care givers	300	WTA	CVM	Face-to-face	(Hanemann model) Logistic regression	Care giver related variables	WTA Influencing factors
Choi HS et al. (2007)	To evaluate the relative benefits and costs associated with home-based occupational therapy (OT) compared to hospital-based OT	Patients	242	WTP	Survey	Face-to-face	-	Patients' medical use Cost-benefit of hospital visit Cost-benefit of home visit	1. Cost-data analysis 2. WTP (cost-benefit)

[†]Literatures of nursing field; [†]MWTP: Marginal WTP for additional costs; [§]Variables other than demographic variable; WTP=Willingness to pay; CVM=Contingent valuation method.

Author	Aims/Purpose	Subjects		WTP [†]	WTP Elicitation	Data Collection	Analysis	Variables [§]	Results
		Subjects	No						
Kim SJ et al. (2007)	To estimate WTP of rural telehealth service for chronic diseases	Patients	451	WTP	CVM	Face-to-face	Survival analysis	Health variables Telehealth related variable	Average WTP & Influencing factors
Rhee HC et al. (2007)	To estimate of WTP for avoiding zoonoses	General population	1,000	MWTP	CVM	Face-to-face & Web-based	-	Perception about disease	Perception & MWTP & Influencing factors
Kwak et al. (2006)	To measure women's WTP for cancer screening and to identify the factors associated with WTP	General population	1,562	WTP	Survey	Telephone	Logistic & Log-linear regression	Health behaviors, Intention	Average and Median WTP & Influencing factors
Lee SW (2006)	To analyzing the sensitivity of WTP whether information about financing method is provided or not	General population	1,717	WTP	CVM	Telephone	(Utility deference model)	Type of information (survey)	Sensitivity of payment mechanism on WTP
Lee SM et al. (2006)	To assess the economic value of Pharmaceutical therapy with Kremezin with CRF	Patients	141	WTP	CVM	Face-to-face	t-test, ANOVA, Multiple regression	Clinical conditions	Mean WTP & Influencing factors
Lee TJ et al. (2006)	To estimate WTP for long-term insurance to be introduced as social insurance and to analyze the factors affecting WTP	General population	450	WTP	CVM	Face-to-face	-	Subjective health status, Bid amount	Average WTP & Influencing factors
Kim HC et al. (2005)	To estimate the demand and analyses what determine the want of long-term-care	General population	326	WTP	CVM	Face-to-face	Frequency, Logistic regression	Health status Demand for service	WTP & Influencing factors (demand)
Kwak SJ et al. (2005)	To analyze WTP for public health-care service	General population	700	MWTP	Multi-attribute valuation method	Face-to-face	-	4 Attributions	MWTP & Influencing factors
Ko SK [†] et al. (2001)	To assess WTP for home health care service in order to apply to the determination of nursing price in a reasonable manner	Patients & care givers	71	WTP	CVM	-	M±SD, Multiple regression	Health problems Bid amount	Average WTP & Influencing factors
Son H et al. (2000)	To investigate the effect factors on the mean WTP for cyber-psychiatric interview	General population	663	WTP	Survey	Web-based survey	ANOVA, Logistic regression,	Internet use Probability of WTP (yes)	Median WTP Influencing factors
Lee JH [†] et al. (1999)	To investigate factors related to intent of using home nursing of chronic disease patients who got out of a university hospital	Patients	153	WTP (need)	Survey	Face-to-face	Frequency, M±SD Factorial analysis	Disease status, Attitude to home nursing	WTP (need) & Influencing factors

[†]Literatures of nursing field; [†] MWTP: Marginal WTP for additional costs; [§]Variables other than demographic variable; WTP=Willingness to pay; CVM=Contingent valuation method.