

FACTORS INFLUENCING PATIENTS' INTENTION TO BYPASS TO HIGHER-LEVEL HOSPITALS IN NORTHERN VIETNAM

¹Pham Van Tuan

ABSTRACTS--*Patients (bypassing to higher level hospital) tend to bypass nearby hospitals then self-transfer to higher-hospitals in recent years which causes hospital overcrowding. There is a huge impact on financial costs, time as well as the risk of cross-infection in hospitals, on drug resistance during treatment later. At the same time, it affects the management and payment of hospital fees of Vietnam Social Insurance. Quantitative research was conducted on stratified randomized samples of 315 patients in the Northern provinces from November 2019 to February 2020. The survey mainly takes place in populous provinces. The questionnaire was developed to collect data on patient characteristics, the impact of the reference group on perceptions and attitudes, the reasons leading to overtaking. In addition, interviews with a group of behavioral experts and leading medical doctors in Vietnam. The authors used SPSS software to analyze the EFA discovery factor and AMOS 22.0 software to analyze the CFA affirmation factor. The results of the study show that the factors of Hospital, Reference group, Awareness and Attitude positively impacted the intention to bypass to higher level hospital; in which attitude had the most positive impact (0.332) and Reference group had less impact than the other three factors (0.249). In addition, the Reference Group has a positive influence on Awareness (0.295) and Attitude (0.177). The research gap of the topic is to consider the influence of the reference group on attitudes and behaviors bypassing to higher level hospital of patients in Northern Vietnam.*

Keywords--*Reference group, Perceived Behavioral Control, Attitudes, Hospital self-transferring, Bypass*

I. INTRODUCTION

One of the urgent medical problems in recent years in Vietnam is hospital overcrowding due to a large number of patient bypassing to high-tier hospitals. Bypassing patients, or patients' hospital self-transferring, is a behavior in which patients receive health care from more distant providers than the health care provider closest to their place of residence (Sander SR et al, 2014) [42]. In 2018, according to the practical data from Ministry of Health [3] more than 35% of patients come to the central level (level I) for treatment but can be treated at the provincial level (Level II). At the provincial level, up to 41.5% of patients could be treated at the district level (Level III) and 11% could be treated at the commune health station (Level IV).

According to the Health Strategy and Policy Institute (2013) [15], the cause of the overload is partly due to the steady economic growth in Vietnam. This led to the need for medical examination and treatment. Health care requirements are higher, while hospitals and health facilities at lower levels are still limited, thus causing

¹ Ph.D. National Economics University, Ha Noi, Viet Nam, Phamvantuan@neu.edu.vn

overcrowding in higher levels of hospitals. Besides, there are numerous reasons behind the overload in higher hospitals such as inadequacies of health insurance policies, inappropriate hospital bypass mechanisms, and autonomy policy of hospitals.

Moreover, the lower-tier hospitals have not fulfilled the task as "the gate guard" which monitor chronic non-communicable diseases, manage primary health care, and educate people about health prevention and promotion [6]. Doctors also do not have many conditions to scrutinize difficult cases so their medical professionalism might fade away. Also, the weakness of the lower-level hospital makes people only go to see the doctor until their illness gets worse, and then they will go straight to the provincial and central levels. This situation leads to overcrowding at the central level, such as Bach Mai Special Hospital which has to receive 70% of patients who decide to self-transfer. This cause inevitable consequences: a waste of resources at the lower levels, tired patients for waiting, more mistakes from doctors and increased risk of cross-infection (Khuong Anh Tuấn et al, 2017) [14]

Previous studies have not fully examined factors affecting the Vietnamese patient's intention to bypass [7][8][12]. In addition, little is known about the application of the TRA behavioral intent theory to the issue of hospital overcrowding in Vietnam. The purpose of this study was to examine factors associated with the choice of hospital bypass from lower to higher-level hospitals. Findings from the study can help the government improve and utilize lower-tier hospitals as well as implement suitable health strategies.

II. THEORETICAL FRAMEWORK

2.1 Relationship between reference group and perceived behavioral controls

Sherif's Autokinetic Effect Experiments (1935) [41] proves that people's perceptions are affected by the community. From the research, Sherif found that in a situation which things are ambiguous, people will adapt to the group's denominator, which is a testament to the informational influence. In addition, Levy's research, Lee (2004) [37] describes the decisions of family members have a strong influence on the individual.

H1: The reference group effects the perceived behavioral control.

Our attitudes and behaviors can be strongly shaped and often inadvertently shaped by those around us (Hardin and Higgins 1996) [31]. Fisher, J. D. (1988) [27] discuss reference group influence on AIDS risks and APB prevention. In the pilot model, reducing behaviors that put individuals at risk of AIDS and increasing AIDS-prevention behaviors (APB), when social network or reference group norms and values are not consistent with APB, they will negatively affect preventive behavior and promote risky behavior. In contrast, when social network or reference group norms and values are all appropriate, the results show their positive influence - decreasing risk exposure.

H2: The strong effect of the reference groups toward the attitude.

Adams et al. (2008) [16] found that hospital characteristics such as distance between hospital and place of residence are the negative factors to patient's intention to self-transfer to higher-hospitals, beds positively impacting bypassing intention. Liu Y, Kong Q, Yuan S, van de Klundert J (2018) [38] indicates that patients in mainland China accept bypassing to higher level hospitals whether it being overloaded or not due to poor service quality and outdated equipment in the lower level hospital or health facilities. Patients want to receive emotional

support from a physician to help them minimize their injuries and anxiety. (Dr. Ali Mohammad Mosadeghrad, 2013) [24]

H3: The elements of hospital also influence the intention of bypass to the higher-hospitals.

In the research from Werner de Cruppé et al. (2017) [25], most patients choose to be treated at the health facilities which they know the most, meaning they have lots of perceived behavioral control about them. These include perceived behavioral control of past experience (more than 50%), perceived behavioral control of the advice of the reference group, and awareness of the distance between the treatment site and their home.

H4: The effect of perceived behavioral control is strong.

With 4,232 outpatients referred to examination, Birk et al. (2011) [19] found that 22% of outpatients consider their past personal experience influenced their hospital choice in the future, while 7% were influenced by your experience. Friends and 5% by family experience. Only 3% refer to the media. Dr. Ali Mohammad Mosadeghrad (2013) [24] points out that recommendations from doctors and health professionals are the main reasons influencing hospital selection. In Wiedenhöfer D & Keppler S's research (2015) [45], the Internet (home page of the hospital) is also classified as an significant source of information.

H5: The reference groups persuade patients to self-transfer to a higher-hospital.

Attitude toward the behaviour reflects an individual's evaluation or general feeling toward a target behaviour. It indicates an individual's positive or negative evaluation about performing the behaviour. The attitude toward behaviour is a product of beliefs about the behaviour and the individual's evaluation of the outcome resulting from that behaviour. The theory postulates that the intention to perform a behaviour will be higher when the individual has positive evaluation of performing the behaviour (Ajzen, 1991) [17] Attitude toward the behavior is the structure of behavioral beliefs and evaluations of the incident which means when people have faith in the knowledge that have been taken, they accesses to be the effect on behavior. If the consequences are likely to be on the positive side or useful, the person will have the extreme intention to that behavior. For example, when people trust in purchasing goods over the internet which is more important to identity theft concerns applying to the illegal, then they would be willing to purchase over the internet (George (2004). [28]

H6: The intention of bypassing can be created by the affection of attitude.

Relationship between peripheral factors (ngoại biến) and self-transfer to higher-hospitals

Demography

Buczko (1992,1994) [20,21] surveyed 670 patients who used medical services in Delaware in 1987 and found that age, sex, length of stay and severity of the disease are factors that influence the health facilities selection. Goldsteen et al. (1994) [29] used the discharge data of 2,171 inpatient in rural Illinois who found that age, payment source, and per capita income are significant determinants of hospital options.

Geography: Vietnamese North Region

The North has complicated terrain, and building the large hospitals in the mountains is difficult to constructed. According to General Statistics Office Of Vietnam (2018) [13], if counting the North alone, the Red River Delta has 74,014 beds, while the Northern Midlands and Mountains region has only 38,755. However, the Government of Vietnam has come up with many solutions to bring medicine closer to the people, namely building a tighter

health network and stronger grassroots health system. In 2017, the Ministry of Health surveyed and selected 26 health stations in 8 provinces and cities, according to 3 regions to deploy and timely adjust in the replication process. The commune health stations follow the Instruction No. 1383/HD-BYT [2] on December 19, 2017 of the Ministry of Health. In particular, mainly renovating the operation of the Health Station according to the principle of family medicine. This can help reduce the hospital overcrowding when the number of beds is not evenly distributed.

In addition, higher-level hospitals can open the second facilities or extend the size so that they can help patients avoid risks during treatment.

The rational distribution of the health facilities network is a factor that influences the intention to self-transfer of the people in general and the North of Vietnam in particular.

Policy

In Vietnam, the Ministry of Health issued Circular No. 43/2013/TT-BYT [1] detailing the technical and professional level for the system of medical examination and treatment facilities as follows:

- Special level: central level: Bach Mai Hospital, Viet Duc University Hospital (Vietnam German Friendship Hospital), Military Central Hospital 108, Cho Ray Hospital, Hue Central Hospital)
- Level I: provincial level of central
- Level II: district level of province
- Level III: communal level of district
- Not ranked: private facilities

However, the way of classification and ranking of hospitals is still inadequate and has not created an appropriate motivation for hospitals to improve the quality of medical examination and treatment. It can be seen that the current ranking of hospitals gives patients absolute confidence in high-class hospitals and ignores lower-level hospitals in local. This makes the upper level always under pressure despite the facilities and medical capacity of the lower level is improving.

According to Clause 3, Article 22 of the Law on Health Insurance 2008 (amended and supplemented in 2014) [10], cases of medical examination and treatment not in line with the right conditions will have little or no benefit from insurance. However, with the current situation in Vietnam, patients still need to seek medical treatment at hospitals at higher levels.

2.2 Research model

Approaching the theoretical framework TRA and overview of the above studies with hypotheses (H1 -> H7) the research team built a research model to consider the degree of influence on the intention of patients bypassing to higher level hospital. In the context of slicing variables such as geography, patients, and policies. This model has variables that are considered in different impacts:

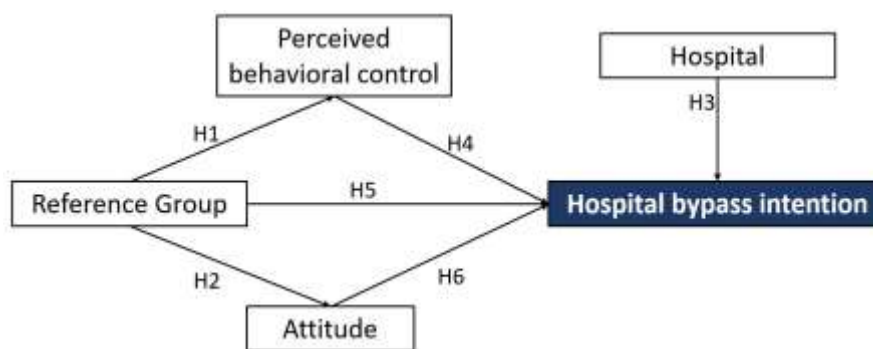


Figure 1: Research model (Source: Research group)

From the basic theory of the TRA model and the above documents, the authors boldly proposed models of hypotheses that influence the intent of outpatient behavior under the impact of slicing variables as geography, patients, policy. This model has variables considered in different impacts:

In this study, the impact of Hospital, Perceived Behavioral Control, Reference Group, Attitude, Patient, Geography and Policy towards Intention can be classified into types of variables:

- Independent variables: Hospital, Perceived Behavioral Control, Reference Group, Attitude, Patient, Geography, Policy
- Dependent variable: Intention to self-transfer to higher-hospitals

In the study the impact of the Reference Group on Perceived Behavioral Control and Attitude:

- Independent variables: Reference group
- Dependent variable: Perceived Behavioral Control, Attitude

III. RESEARCH METHODS

Research is done through two steps: preliminary research and formal research. Specifically, in the qualitative preliminary survey, the author conducted in-depth interviews with marketing, behavioral and health experts from the two National Economics University and the Hanoi School of Public Health and focus group interviews with 20 people to complete draft scale 1 and create draft scale 2.

After that, the official research questionnaire was put into a quantitative survey in Northern Vietnam. The survey sample includes patients who have been and will be intentionally crossing the line. From cities and provinces, the author chose an appropriate research sample. The author conducted patient interviews in Northern Vietnam according to a reasonable proportion of the population. Specifically, respondents in the profile were as follows: women accounted for 61.59% of men and women; 4 age groups (under 18, 18-30, 31-50, over 50). In this study, the author collected samples on a scale of 321 respondents ($n = 321$) and actual answer was 315 (questionnaire). After screening and removing invalid questionnaires, the author used 315 valid responses for formal analysis. To test the scale and research model, the author used SEM (Model equation structure). Detailed data checking is performed through the following steps:

1. Preliminary assessment of scales and reliability of variables measured by Cronbach's Alpha coefficient and EFA discovery factor analysis.

2. Use CFA (Affirmative factor analysis) to closely examine the uniqueness, aggregate reliability and value (convergence, differentiation) of the factors, as well as examine model model assumptions. Research and overall suitability of the model with the help of SPSS 22.0, AMOS software in SEM analysis

Table 1: Sample description (Source: Research group)

| No. | CRITERIA | | FREQUENCY | RATIO (%) |
|-----|-----------------|-------------------------|-----------|-----------|
| 1 | Sex | Male | 121 | 38.41 |
| | | Female | 194 | 61.59 |
| 2 | Age | <18 | 13 | 4.13 |
| | | 18-31 | 127 | 40.31 |
| | | 31-50 | 115 | 36.51 |
| | | >50 | 60 | 19.05 |
| 3 | Geography | Highland | 167 | 53.02 |
| | | Countryside | 82 | 26.03 |
| | | City under the province | 62 | 19.68 |
| | | Central cities | 4 | 1.27 |
| 4 | Health services | Medical | 146 | 46.35 |
| | | Surgery | 101 | 32.06 |
| | | Obstetric | 19 | 6.03 |
| | | Pediatrics | 11 | 3.49 |
| | | Others | 38 | 12.06 |

The sample size includes 315 patients, of which 61.59% are female and 38.41% are male. The age of these subjects is mainly in the age group of 18-31 (40.31%), 31-50 (36.51%) and >50 (19.05%), the rest are aged <18 (4.13%). The patients using medical services, accounting for 46.35%, surgical services, accounting for 32.06%, Obstetric services accounting for 6.03%, pediatric services accounted for 3.49% and other services accounted for 12.06%. The current living regions of respondents is mainly highland (53.02%) and countryside (26.03%), the remaining is city under the province (19.68%) and central cities (1.27%).

IV. RESEARCH RESULTS

4.1. EFA analysis

Using SPSS 20.0 software, the author has drawn the results of the reliability of the scale (Cronbach Alpha) and the results of the EFA (Discovery Factor Analysis) to eliminate some observed variables, helping the scale. Evaluate the factors more accurately. The test standard is Cronbach Alpha ≥ 0.6 (Hair et al.) [30] and the extraction variance is greater than 50%. Specific results are summarized in Table 1 below

Table2: Summary of reliability and average variance Extraction of the scale

| No. | Scale | Number of observed variables | Cronbach's Alpha | Source and calibrated scales |
|-----|------------------------------------|------------------------------|------------------|---|
| 1 | Hospital (HOS) | 3 | 0.934 | Phùng Thị Hồng Hà et al. (2012) [9] ThS. Hồ Bạch Nhật (2014) [11] de Cruppé W et al. (2017) [25] E. Kathleen Adams et al. (1991) [26] Liu Y et al. (2018) [38] Sandra K. Smith Gooding (1994) [43] |
| 2 | Attitude (TT) | 6 | 0.893 | David S. Martin et al. (2011) [23] |
| 3 | Perceived Behavioral Control (PBC) | 8 | 0.905 | Christina L. Jonesa et al. (2014) [22] Jilan Ali Ibrahim Al- Battawi et al. (2017) [34] U.S. Public Health Service (1950) [44] |
| 4 | Reference group (RG) | 6 | 0.838 | Kara Chan (2000) [35] Mohamad hasnan Ahmad et al. (2014) [39] |
| 5 | Intention (INT) | 5 | 0.868 | Ing-Long Wu et al. (2005) [33] Rebecca Cameron et al. (2012) [40] |

Based on the above result table, the scales of the model are all > 0.6 and there is no case of eliminating observed variables. Therefore, all observed variables are accepted and will be used in subsequent factor analysis.

4.2. Positive factor analysis (CFA)

After preliminary testing of the scale, the author continues to use AMOS software version 22.0 to conduct CFA (Positive factor analysis) for the scale, to check the appropriateness of the research model and hypotheses.

research. The test criteria used include CMIN / df; Kindness of Relevant Index; Tucker & Lewis index; Relevant index comparison; Approximate squared error. The model is considered suitable when testing Chi squared with P value ≥ 0.05 . However, the downside of Chi-square is that it depends on the sample size. The larger the sample size, the larger the Chi-square thus reducing the fit of the model. Therefore, besides P value, CMIN / df is also used. Some practical studies indicate that when CMIN / df < 5 (with sample size $N > 200$); or < 3 (with sample size $N < 200$), the model is considered suitable (Ketinger and Lee, 1995) [30]. In this study, because the sample size was $N = 252$ ($N > 200$), according to Ketinger and Lee (1995) [36], CMIN / df < 5 ; GFI, TLI, CFI ≥ 0.9 (Bentler & Bonett, 1990) [18]; RMSEA ≤ 0.08 shows the research model is suitable. CFA results of the above scales are presented in the following Figure 1:

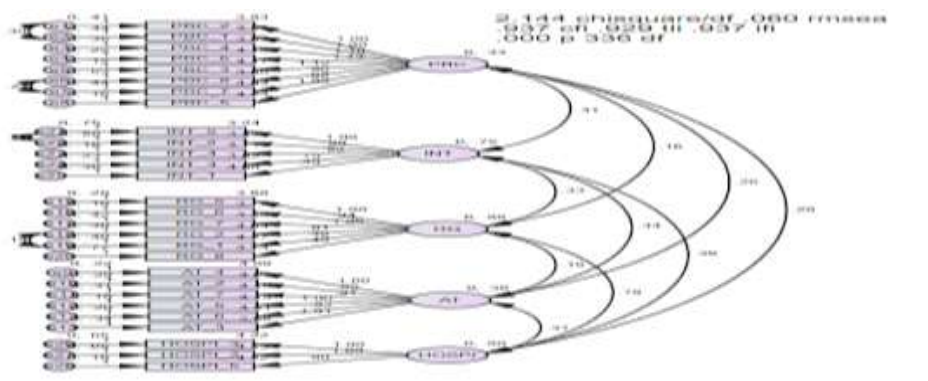


Figure 2: CFA test results for the scale

Figure 1 shows that the TLI and CFI are both greater than 0.9; Chi-square / df < 5 and RMSEA < 0.08 , proving that the scale fits perfectly.

4.3. Testing models and research hypotheses

4.3.1 Model testing

After testing the scales, the author conducted an official test for the research model:

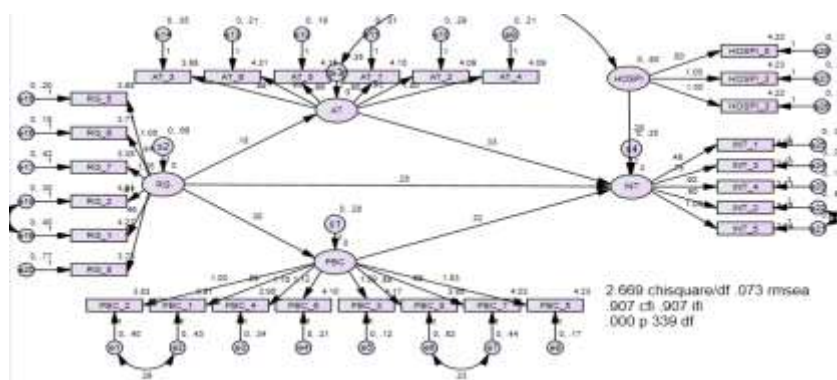


Figure 3: SEM model results

Test results of research model (Figure 1) show that: Chi-square / df = 2,669; TLI = 0.896; CFI = 0.907; RMSEA (model relevance to overall) = 0.073. Although the TLI index has not yet fully met the standard, but

considering the TLI ~ 0.9 is very close to the standards of Bentler and Bonett (1990) [18], this model is still suitable for market data.

4.3.2. Testing research hypotheses

The results show that the relationships are statistically significant ($P < 5\%$).

Table 3: Results of hypothesis testing

| Relationship | Estimate | S.E. | C.R. | P |
|----------------|----------|------|-------|-----|
| AT <--- RG | .177 | .039 | 4.553 | *** |
| PBC <--- RG | .295 | .046 | 6.380 | *** |
| INT <--- PBC | .322 | .082 | 3.926 | *** |
| INT <--- HOSPI | .285 | .070 | 4.057 | *** |
| INT <--- RG | .249 | .061 | 4.077 | *** |
| INT <--- AT | .327 | .096 | 3.410 | *** |

In which: Estimation: estimated average value; SE: standard deviation; CR: critical rate; P: significance level; ***: $p < 0.001$.

In addition, Table 3 shows among the 4 factors Hospital, Reference Group, Perceived Behavioral Control and Attitude; Attitude had the most positive impact on the intention to cross the hospital line (0.332) and the Reference Group had less impact than the other three factors (0.249). In addition, the Reference Group has a more positive influence on Perceived Behavioral Control (0.295) than the Attitude factor (0.177).

5. Compare market segments: Analyzing the structure of multi-group demographic variables:

Analysis of multi-group structure of demographic variables for men and women

The research team used the multi-group structure analysis method to compare the research model showing the impact of the hospital, reference group, perceived behavioral control and attitude to intention to bypass local hospitals by gender group (male/female).

According to Nguyen Dinh Tho and Nguyen Thi Mai Trang [4], the method of analyzing multi-group structure includes the method of variable and partial invariants. In the variable method, the estimated parameters in each model of the groups are not bound (Figure 4.6). In the partial invariant method, the measurement component is not bound but the relationship between the concepts in the research model is constrained and has the same value for all groups. After a variable model and invariants model is available, the Chi-square test is used to compare the two models. If the Chi-square between the model is different ($p\text{-value} > 0.05$), the variable model will be chosen because of its higher compatibility (Nguyen Khanh Duy, 2009) [5]

SEM results of the variable model for 2 groups of male and female customers: $\chi^2 = 1373,913$; $df = 678$; $p = 0,000$; $\chi^2 / df = 2,026$; $TLI = 0.875$; $CFI = 0.888$; $RMSEA = 0.057$.

SEM results of partial invariant models for 2 groups of male and female customers $\chi^2 = 1377.6$; $df = 684$; $p = 0,000$; $\chi^2 / df = 2,014$; $TLI = 0.887$; $CFI = 0.888$; $RMSEA = 0.057$

Demonstrate that both the variable and the invariant models of both male and female clients are consistent with market data.

The results of testing the difference of compatibility criteria between the variable and partial invariants (Table 4.10) show that the differences between the two models are statistically significant ($p = 0.00 < 0.05$). Therefore, the variable model was chosen and allowed to conclude that there were differences between male and female patients in assessing the impact of the Hospital, Reference Group, Perceived behavioral control and Attitude on Intention to bypass hospitals within Northern Vietnam regions.

Table 4.10. Compare variable model with partial invariance model according to the gender of the patients

| Comparative model | χ^2 | df | p | TLI | CFI | RMSEA |
|-------------------|----------|-----|-------|-------|-------|-------|
| Invariant | 1377,6 | 684 | 0,000 | 0,877 | 0,888 | 0,057 |
| Variable | 1373,913 | 678 | 0,000 | 0,875 | 0,888 | 0,057 |
| Value difference | 3,687 | 6 | 0,000 | 0,000 | 0,000 | 0,000 |

Compare market segments by demographic criteria

The NPar test shows that the age of patients who have the highest level of hospital bypass is between 31 and 50 years old (186.48 [MOU1]).

Similarly, when applying the NPar test to geographic areas, including mountainous, rural, provincial cities and central cities. The results show that patients in rural areas have the highest intention to bypass local hospital (199,32).

| | Age | N | Mean Rank | | Area of resident | N | Mean Rank |
|-------|----------|-----|-----------|------|-------------------|-----|-----------|
| tbINT | Under 18 | 13 | 135.96 | bINT | Highland | 167 | 146.38 |
| | 18 – 30 | 127 | 156.16 | | Rural area | 82 | 199.32 |
| | 31 – 50 | 115 | 186.48 | | Provincial cities | 62 | 136.63 |

| | | | | | | | |
|--|---------|-----|--------|--|----------------|-----|--------|
| | Over 50 | 60 | 112.08 | | Central cities | 4 | 127.38 |
| | Total | 315 | | | Total | 315 | |

In addition, the research team continued to use the NPar test with the medical examination and treatment services used by the patient when bypassing hospitals. Among the Internal Medicine, Surgery, Obstetrics, Pediatrics, and Other Services (geriatric, ophthalmic, psychiatric, infectious ...) patients have the most desire to bypass when using the Internal Medicine service (171.64). In addition, patients who want to use Surgical services also have much higher bypass intention (164.20) than patients who need to use Obstetrics, Pediatrics and Other Services.

| | Medical services used when bypass | N | Mean Rank |
|-------|-----------------------------------|-----|-----------|
| tbINT | Medical | 146 | 171.64 |
| | Surgery | 101 | 164.20 |
| | Obstetric | 19 | 116.71 |
| | Pediatrics | 11 | 122.14 |
| | Other | 38 | 120.16 |
| | Total | 315 | |

V. DISCUSSION

6.1. Research results discussion

According to our results, the attitude has the most positive impact on bypassing higher-level hospitals behavior (0.327). This result reflects the current situation at the commune, ward, district, and provincial health centers. Along with the incomplete provision of information on medical examination and the weak ability of lower-level hospitals, patients' awareness will inevitably lead to psychological confusion and fear of patients.

At the same time, with the development of the Industrial Revolution 4.0, fake news has dominated the media and become a source of information, or a reference group. The reference group has a positive influence on awareness (0.295), once again affirming that information and communication activities about health from governments, hospitals, health organizations are very important. Therefore, all stakeholders should be in charge of conveying accurate health and disease information to the public. Furthermore, hospitals seem to have monopoly power which is a barrier to patients whereas patients are customers who pay bills to be cured and taken care of. Thus, grassroots hospitals and health care facilities need to improve service quality and increase customers' satisfaction to maintain customer loyalty (patients).

In general, the thesis has affirmed the hospital factors, reference groups, awareness, positive attitude to the intention to bypass, and this result is consistent with market data and research work.

Moreover, to increase the value of the research, the team conducted tomography, market segmentation analysis, conducted the NPar test that showed the age of patients who intend to exceed the highest hospital line of the group is from 31 - 50 years old. When applying the NPar test to geographic areas, the results show that in the mountainous areas, rural areas, provincial cities, and central cities, patients in rural areas intend to bypass the most (199,32). This also clearly reflects the situation of the age and the health care system at the grassroots level is often worse than the central level. The team continued to use the NPar test with the medical examination and treatment services used by the patient when crossing the line. Among the Internal Medicine, Surgery, Obstetrics, Pediatrics, and Other Services (geriatric, ophthalmic, psychiatric, infectious ...) patients have the most desire to use Internal Medicine when they have the intention to bypass (171.64). Besides, patients who want to use Surgical services are also much higher (164.20) than patients who need to use Obstetrics, Pediatrics and Other Services when bypassing to higher-level hospitals.

The research results and discussion has proved the intention to cross the line is influenced by many factors, both objective and subjective. To minimize the situation of bypassing, it is necessary to call the actions of departments, unions, and stakeholders.

First of all, the government needs to have policies related to health insurance, the budget for all levels of health and the need for more strict regulations on medical examination and treatment for out-of-line to manage over-route in the health system. In parallel with the above measures, the government needs to monitor the level of service improvement in urban and rural hospitals, especially grassroots health care, and primary health care. Regarding the quality of examination at lower-level hospitals, it is necessary to have policies to attract talents, or regularly organize seminars to improve the skills of physicians.

Also, people need to voluntarily raise awareness and accountability to the community. Governments and hospitals should pay attention to using appropriate media for the majority of the population. For example, during the recent COVID-19 epidemic, the Ministry of Health and the Prime Minister have sent messages to citizens daily and released the song "Ghen Cô Vy" with a catchy tune that instructed hand washing correctly. These are effective means of communication in the 4.0 revolution. If information is applied regularly to the propaganda or the dissemination of health care for infectious diseases such as tuberculosis or COVID-19, it can positively impact citizens' awareness, thereby orienting proper behavior.

6.2. Limitations and future research recommendations

Firstly, the authors' research sample is concentrated in Northern highlands, Nam Dinh province and scattered in some other Northern cities and provinces. In the meantime, due to the COVID-19 pandemic during the survey period, the number of samples was still modest. Although these are densely populated provinces and the sample size is considerably larger than the minimum, it is difficult to confirm whether the results would represent for people in other areas or not.

Secondly, although the article has attempted to concretize and express the research scales clearly, it might have led to difficulties in understanding and incorrect responses due to the limited medical knowledge of

respondents. Future research studies would examine other factors affecting patients' behaviors and find suitable implement to reduce bypassing rate.

REFERENCES

1. Ministry of Health (2013). Circular: Providing For Technical And Professional Levels In The Network Of Health Facilities, No. 43/2013/TT-BYT, December 11 2013.
2. Ministry of Health (2017). Guidance: How to implement a pilot model at 26 commune health stations from 2018 to 2020, No 1383/HD-BYT. Bộ Y tế (2017). Hướng dẫn: Triển khai mô hình điểm tại 26 trạm y tế xã 2018-2020, số 1383/HD-BYT.
3. Ministry of Health (2018). Health Report on October 12, 2018 Bộ Y tế (2018). Điểm tin Y tế ngày 12/10/2018.
4. Nguyen Dinh Tho, Nguyen Thi Mai Trang (2007). Study on Science of Marketing – Apply the Structural Equation Model (SEM), published by Vietnam National University in Hồ Chí Minh City. Nguyễn Đình Thọ và Nguyễn Thị Mai Trang (2007). Nghiên cứu khoa học marketing - Ứng dụng mô hình cấu trúc tuyến tính SEM, NXB Đại học Quốc gia TP. HCM.
5. Nguyen Khanh Duy (5/2009). Lecture on practicing Structural Equation Model (SEM) with AMOS software, the first draft, published by Vietnam National University in Ho Chi Minh City. Nguyễn Khánh Duy (5/2009). Bài giảng thực hành mô hình cấu trúc tuyến tính (SEM) với phần mềm AMOS, bản thảo lần 1, ĐH Kinh tế TP. HCM.
6. Nguyen Nam Liem (Department manager of Financial Strategy Department, Ministry of Health) (2018). Closing conference between Ministry of Health and Ministry of Finance: “When will medical facilities pull their weight as ‘the gate guard’?” Nguyễn Nam Liêm (Vụ trưởng Vụ Kế hoạch Tài chính, Bộ Y tế) (2018). Hội nghị tổng kết của Bộ Y tế và Bộ Tài chính: “Khi nào Y tế cơ sở tròn vai “người gác cổng”?”
7. Nguyen Viet Tri, Lam Hong Son, Vo Thi Diem (2015). Assess the bypass situation according to Circular No 14/2014/TT-BYT at Ca Mau Obstetrics and Pediatrics Hospital in 2015. Nguyễn Việt Trí, Lâm Hồng Sơn, Võ Thị Diễm (2015). Đánh giá tình hình chuyển tuyến theo quy định của thông tư 14/2014/TT-BYT tại Bệnh viện sản nhi Cà Mau năm 2015.
8. Nguyen Tran Huu Tuan et al (2019). The situation of bypassing of Emergency and Intensive care department at Hoc Mon regional Hospital in 2018-2019. Nguyễn Trần Hữu Tuấn và cộng sự (2019). Thực trạng chuyển tuyến của khoa hồi sức cấp cứu bệnh viện đa khoa khu vực Hóc Môn năm 2018-2019.
9. Phung Thi Hong Ha, Tran Thi Thu Hien (2012). Assess the customer satisfaction of medical service at Viet Nam – Cu Ba (Dong Hoi – Quang Binh province). Phùng Thị Hồng Hà, Trần Thị Thu Hiền (2012). Đánh giá sự hài lòng của khách hàng sử dụng dịch vụ y tế tại bệnh viện Việt Nam - Cu Ba Đồng Hới - Quảng Bình.
10. Parliament (2014). Law: Amendments to the law on Health Insurance, No. 46/2014/QH13. Quốc hội (2014). Luật: Sửa đổi, bổ sung một số điều luật của bảo hiểm y tế, số 46/2014/QH13.
11. MA. Ho Bach Nhat (2014). The inpatient satisfaction of medical and examination service in hospitals in Long Xuyen city. ThS. Hồ Bạch Nhật (2014). Sự hài lòng của bệnh nhân nội trú đối với chất lượng dịch vụ khám chữa bệnh của các bệnh viện tại thành phố Long Xuyên.

12. Tran Thi Ngoc (2016). Thematic internship report: “Study on the influence of reference group towards the behavior to choose medical and examination service of North citizen, Viet Nam”. Trần Thị Ngọc (2016). Chuyên đề thực tập “Nghiên cứu ảnh hưởng của nhóm tham khảo đến hành vi lựa chọn dịch vụ khám chữa bệnh của cư dân tại miền Bắc”.
13. General Statistics Office of Vietnam (2018). Number of patient beds in 2018 by province
14. PhD. Khuong Anh Tuan et al, Health Strategy and Policy Institute (2017). Assess the overcrowding situation in hospitals in Hanoi and Ho Chi Minh city and recommend solutions. TS. Khuong Anh Tuấn và cộng sự, Viện Chiến lược và Chính sách Y tế (2017). Đánh giá tình hình quá tải của một số bệnh viện tại Hà Nội và thành phố Hồ Chí Minh và đề xuất giải pháp khắc phục.
15. Health Strategy and Policy Institute (2013). Study on current situation of overcrowding, under-crowding in hospitals at levels and recommended solutions for improvement.
16. Adams, K., Houchens, R., Wright, G., and Robbins, J., (1991) Predicting hospital choice for rural Medicare beneficiaries: the role of severity of illness. *Health Serv. Res.* 26:583–612.
17. Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
18. Bentler, P. M. (1990). Comparative Fit Indexes in Structural Models. *Psychological Bulletin* 107.2 (February): 238-246.
19. Birk et al., (2011). Patients’ experience of choosing an outpatient clinic in one county in Denmark: results of a patient survey.
20. Buczko, W., (1992). What affects rural beneficiaries use of urban and rural hospitals? *Health Care Financ. Rev.* 14:107–115.
21. Buczko, W., (1994). Bypassing of local hospitals by rural Medicare beneficiaries. *J. Rural Health.* 10:237–246.
22. Christina L. Jonesa , Jakob D. Jensenb, Courtney L. Scherrc, Natasha R. Brownd, Katheryn Christye & Jeremy Weaverf (2014). The Health Belief Model as an Explanatory Framework in Communication Research: Exploring Parallel, Serial, and Moderated Mediation.
23. David S. Martin, Zo Ramamonjiarivelo and Warren S. Martin (2011). MEDTOUR: a scale for measuring medical tourism intentions.
24. Dr. Ali Mohammad Mosadeghrad (2013). Factors Influencing Healthcare Service Quality.
25. de Cruppé W, Geraedts M. (2017). Wie wählen Patienten ein Krankenhaus für elektive operative Eingriffe? How do patients choose a hospital for elective surgery?
26. E. Kathleen Adams and George E. Wright (1991). Hospital Choice of Medicare Beneficiaries in a Rural Market: Why Not the Closest?
27. Fisher, J. D. (1988). Possible effects of reference group-based social influence on AIDS-risk behavior and AIDS-prevention. *American Psychologist*, 43 (11), 914–920.
28. George, J. F. (2004). The theory of planned behavior and Internet purchasing. *Internet Research*, 14(3), 198-212.
29. Goldsteen, R., Falcone, D., Broyles, R., Goldsteen, K., and Reily, B., (1994). Local factors affecting the tendency to bypass local hospitals for inpatient mental health care: An exploratory analysis. *J. Rural Health.* 10:89–97.

30. Hair, Jr. J. F, Anderson, R. E. Tatham, R. L. & Black, W. C. (1998). *Multivariate Data Analysis*, 5th ed, Upper Saddle River Prentice-Hall.
31. Hardin, C. D., & Higgins, E. T. (1996). Shared reality: How social verification makes the subjective objective. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition: The interpersonal context* (pp. F29–84). New York, NY: Guilford Press.
32. Hawkins, D. I., Best, R. J., & Coney, K. A. (2001). *Consumer behavior, building marketing strategy* (8th ed.). Homewood, IL, New York: Irwin, McGraw-Hill.
33. Ing-Long Wu, Jian-Liang Chen (2005). An extension of Trust and TAM model with TPB in the initial adoption of online tax: An empirical study.
34. Jilan Ali Ibrahim Al- Battawi, Wafaa Ahmad Ibrahim (2017). *Applying Health Belief Model to Predict Factors influencing Women decision regarding Mode of Delivery*.
35. Kara Chan (2000). *Environmental Consideration in Purchase Decisions of Hong Kong Consumers*.
36. Kettinger, William J. and Choong C. Lee. (1995). "Perceived Service Quality and User Satisfaction with the Information Services Function", *Decision Sciences* 25.5-6 (Sept:Oct-Nov:Dec): 737-766.
37. Levy, D., & Lee, C. K.-C. (2004). The influence of family members on housing purchase decisions. *Journal of Property Investment & Finance*, 22(4), 320-338.
38. Liu Y, Kong Q, Yuan S, van de Klundert J (2018). Factors influencing choice of health system access level in China: A systematic review.
39. Mohamad hasnan Ahmad, Suzana Shahar, nur Islami Mohd, Fahmi Teng, Zahara Abdul Manaf, noor Ibrahim Mohd sakian, Baharudin Omar (2014). *Applying theory of planned behavior to predict exercise maintenance in sarcopenic elderly*.
40. Rebecca Cameron, Harvey Ginsburg, Michael Westhoff and Roque V. Mendez (2012). *Ajzen's Theory of Planned Behavior and Social Media Use by College Student*.
41. Sherif, M. (1935). A study of some social factors in perception. *Archives of Psychology*, 27, 187.
42. Sander SR et al., (2014). *Patient Bypass Behavior and Critical Access Hospitals: Implications for Patient Retention*.
43. Sandra K. Smith Gooding (1994). *Hospital Outshopping and Perceptions of Quality: Implications for Public Policy*.
44. U.S. Public Health Service (1950). *The Health Belief Model (HBM)*.
45. Wiedenhöfer D & Keppler S (2015). *Hospital choice in Germany from the patient's perspective: a cross-sectional study*.