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# Assessment of the Quality of Health Facilities & Infrastructure to Support District Regional and City Planning Facilities

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**Abstract**

*Health facilities are a kind of public infrastructure essential for enhancing community health standards. According to statistical data from the city of Batam, the population of the Nongsa Keluran Batu Besar sub-district was 29,198 in 2020. The majority of respondents perceived the quality of medical personnel services for the general public in Batu Besar Village as satisfactory, evidenced by 50% of respondents. The quality of administrative services for the general public in Batu Besar Village was also deemed satisfactory, as indicated by 45% of respondents. Furthermore, the quality of pharmacist services for the general public in the Batu Besar sub-district was regarded as moderately satisfactory, supported by 47.5% of respondents. The quality of BPJS services for the general people in the Batu Besar sub-district is commendable. This is substantiated by the proportion of responses, which is 52.5%. The level of nursing services for the general people in the Batu Besar sub-district is commendable. This is evidenced by the number of replies, which is 70%. A majority of respondents, 65%, perceived the equipment facilities for the general public in Batu Besar Village as satisfactory, while 60% regarded the room facilities as reasonably good. A majority of respondents, constituting 40%, perceived the public parking facilities in Batu Besar Village as highly satisfactory.*

## Introduction

ToHealth is the most important thing for every person and health is also a human right of every citizen. Everyone has the same right to access safe, quality and affordable health services (Health Law No. 36/2009), the aim of health development is to increase awareness, willingness and ability to live healthily for everyone so that health can be achieved. the highest level of society (World Health Organization, 2013), Mens sana in corpore sano, is a sentence in Latin which means "a healthy soul in a healthy body.

Health facilities are one type of public facility needed by the community which functions to improve the level of public health. Health service factors, the availability of service facilities and quality health personnel will influence the status of health problems that occur in the work area even though the problem is located far from health facilities (Thaddeus & Meine, 1994; Ardebili et al., 2021; Giorgi et al., 2020)

PThe health center as the regional technical implementation unit of the Regency/City Health Service is responsible for carrying out health development in its working area. In order to carry out its function well, the health center must still be able to maintain the quality of service, supported by adequate facilities and infrastructure and supported by the creation of a clean,



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beautiful environment, neat and pleasant so that it can meet the patient's expectations or needs which ultimately can provide satisfaction to the patient (Abnory, 2020).

The provision of health service facilities is the responsibility of the regional government in accordance with the provisions of Law Number 36 of 2009 concerning Health which states that the government is responsible for the availability of health service facilities for the community to achieve the highest possible level of health (Singh et al., 2021; Naher et al., 2020; Abubakar et al., 2022).

Based on statistical data from the city of Batam, the population of Nongsa Keluran Batu Besar sub-district with a population in 2020 of 29,198 people. The area of this sub-district is 96.68 km², and the density is 302 people/km².

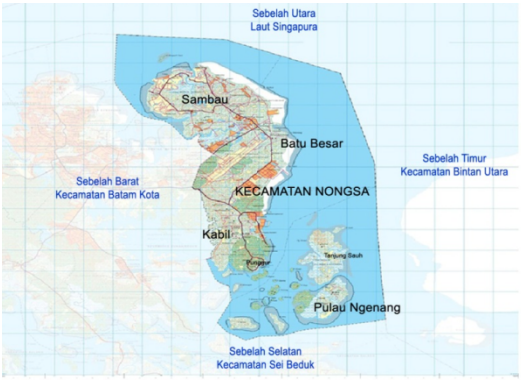


*Figure 1. Location map of Nongsa District, Batam City*

**Study Objectives**

There are several factsfactors that influence service quality include competency, according to RI Law No. 36 of 2014 concerning health workers states that competency is the ability that a health worker has based on knowledge, skills and professional attitudes to carry out practice.

**Scope**

The scope of this study involves: 1) Search for Health Facilities: Evaluation of hospitals, health centers, clinics and doctors' practices in Batu Besar District; 2) Analysis of Supporting Infrastructure: Mapping transportation accessibility to health facilities, Assessment of health supporting infrastructure such as roads, electricity and water; 3) District Profile: Understanding the general characteristics and demographic conditions in Batu Besar District; 4) Suitability of Facilities to Needs: Analysis of the availability of health facilities and the extent to which they can meet the needs of the population; 5) Recommendations for Improvement: Preparing recommendations for improvement and development to improve the quality of health facilities and infrastructure. This scope is designed to provide a comprehensive picture of health conditions in Batu Besar District and provide a basis for concrete recommendations for improvement.

## Methods

The location of this research was carried out in Kampung Tua Batu Besar, Nongsa District, Batam City. where the location of the Old Batu Besar village is one of 32 old villages in Batam City and 14 old villages in Nongsa District. The location of this old village has a natural atmosphere with a strong culture and Malay community or indigenous people who still maintain and maintain local wisdom and cultural values when carrying out traditional Malay cultural events and still carry out their daily lives with traditional tools to maintain the characteristics of the region. The following is a map of the research location.



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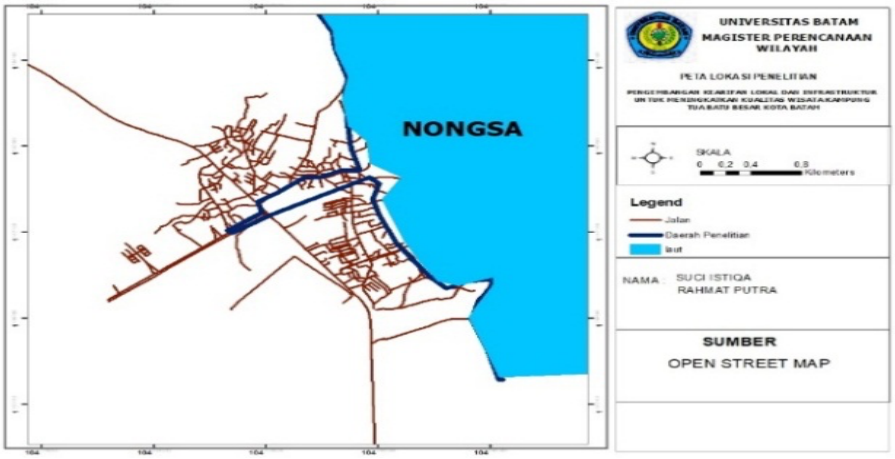


*Figure 2. Research sites*

Data collection methods consist of primary and secondary data. Primary data is data obtained from field activities or during prasurveys by direct field observation. The elements observed are environmental conditions, infrastructure, supporting facilities, distance from settlements, number of medical personnel and services to the surrounding community. Secondary data obtained is from study sources such as study reports, scientific publications and statutory regulations.

## Results and Discussion

Health is the most basic need of the human body. Human needs vary greatly from the most basic (physiological) needs which are more directed at maintaining survival to the human need for beauty. Many psychologists have made efforts to classify human needs, including Abraham Maslow in 1970 with the hypothesis that needs are organized in such a way as to establish priorities and a hierarchy of interests. According to Maslow, there are five levels of needs that are aligned in priority from the lowest order to the highest order. These levels fall into three basic categories, namely (1) survival and security, (2) human interaction, love and affiliation, (3) self-actualization (competence, self-expression and understanding). 80 Maslow identified a hierarchy of seven levels of needs arranged in human order. People will remain at a level where their needs are satisfied. Then new needs emerge at a higher level. Maslow identified the needs for knowledge and beauty as additional cognitive needs for a number of people that fulfill the need for self-actualization. In the context of Maslow's needs, health is part of the most basic physiological needs in addition to other physiological needs such as eating, drinking and housing. According to Mills and Gilson (in Putra: 2010) stated that health is a need which is defined generally as a comparison between the real situation and certain agreed technical standards. Apart from that, health is a felt need, namely a need felt by the individual himself. So the decision to utilize a health service is a reflection of a combination of normative and perceived needs. The World Health Organization (WHO) defines health as a condition of physical, mental and social well-being, and not just the absence of disease and physical weakness. In practice, the measurement of health level used includes life expectancy. This measure is one of three components in calculating the Human Development Index (HDI). In general, we can conclude that what is meant by health is a state of physical, mental and social well-being that enables every person to live a socially and economically productive life. From this understanding we clearly know that health is the key to all human activities

Understanding Health Infrastructure According to Setyaningrum (in Sagita, 2013), infrastructure is part of the capital stock of a country, namely social fixed costs that directly



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support production. Stone (in Kodoatie: 2005) defines infrastructure as physical facilities developed or required by public agencies for government functions in the provision of water, electricity, waste disposal, transportation and other services to facilitate economic and social goals. The infrastructure itself in a system supports the social system and economic system as well as being a link with the environmental system. The availability of infrastructure has an impact on the social system and economic system in society. Therefore, infrastructure needs to be understood as the basis for making policies (Kodoatie, 2005). Infrastructure development in a system supports existing activities in a space. Infrastructure is a container for development. The availability of infrastructure increases people's access to resources so that they can increase resources so that they can increase efficiency and productivity which leads to the economic development of an area or region. Engineering systems and infrastructure management influence the land use system which ultimately builds an activity. The relationship between infrastructure development and land use systems is emphasized by Grigg & Fontane (2000) that infrastructure engineering and management 81 in utilizing resources in the context of utilization for transportation, water infrastructure, waste, energy, as well as buildings and structures form and influence economic and social systems. -culture, health and welfare. Infrastructure can be categorized into three types, namely: 1) Economic infrastructure, is the physical assets needed to support economic activities both in production and final consumption, including public utilities (power, telecommunications, drinking water, sanitation and gas), public works (roads, dams, canals, irrigation and drainage channels) as well as the transportation sector (roads, railways, port transportation, airports and so on); 2) Social infrastructure, is an asset that supports community health and skills, including education (schools and libraries), health (hospitals and health centers), housing and recreation (parks, museums, etc.); 3) Administrative/institutional infrastructure, including law enforcement, administrative control and coordination and culture. Infrastructure facilities not only function to serve various public interests but also play an important role in private activities in the economic sector.

Infrastructure needs are a choice (preference), where there is no general standard for determining the appropriate size of facilities in an area or population. Edwin (in Permatasari: 2014) describes public infrastructure as consisting of categories in service facilities and production facilities. Service facilities include the following categories: 1) Education, in the form of elementary schools, middle schools, high schools and public libraries; 2) Health, in the form of hospitals, care homes, examination facilities by mobile doctors, dental care facilities by mobile car, mental health facilities by mobile car, orphanages, care for people with emotional disorders, care for alcoholics and drug addicts, care for disabled people physical and mental, blind and deaf homes, and ambulances; 3) Transportation, in the form of a network of railways, airports and related facilities, roads and bridges within cities and between cities as well as passenger terminals; 4) Justice, in the form of law enforcement facilities and prisons; 5) Recreation, in the form of community recreation and sports facilities. Of the types of infrastructure above, one of them includes health infrastructure. What is meant by health is that the World Health Organization (WHO) defines health as a condition of physical, mental and social well-being, and not just the absence of disease and physical weakness. In practice, the measurement of health level used includes life expectancy. This measure is one of three components in calculating the Human Development Index (HDI). Health development is an integral part of national development because the health sector touches almost all aspects of human life on an ongoing basis, which is a series of comprehensive, integrated and directed development. This development is an effort to achieve awareness, will and ability to live healthily for every resident in order to achieve an optimal level of health. Through health development, it is hoped that every resident will have the ability to live a healthy life so that in



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the future, quality future generations will be created as important capital in national development. The goal of health development stated in the Health Development Strategy Plan is the implementation of health development programs or activities that guarantee the achievement of the highest level of public health. The direction of health development policy according to the Ministry of Health (2004) is: Improving the quality of human resources and a mutually supportive environment, with a healthy paradigm approach that prioritizes efforts to improve health, prevention, healing, recovery and rehabilitation from conception in the womb until old age. Improving and maintaining the quality of health institutions and services through sustainable empowerment of human resources and infrastructure in the medical sector, including the availability of medicines that are accessible to the community (Bigdeli et al., 2013). Health services through hospitals and community health centers as well as other health services are expected to improve the quality of health that reaches the entire community to realize equitable health development. The development of health infrastructure, both in quantity and quality, will encourage an increase in the quality of human resources so that the human development index (HDI) will also increase because health is one of the indicators.

**Provision of Health Facilities and Infrastructure**

According to Adisasmito (2007), health efforts are an arrangement that brings together various public health efforts and individual health efforts in an integrated and mutually supportive manner to ensure the highest level of public health is achieved. Providing health administration offices is an obligation of the central government and regional governments in accordance with Law Number 36 of 2009 concerning Health which states that public authorities are responsible for the accessibility of health administration offices for regions to provide the most important welfare status. In Law Number 36 of 2009 it is stated that Regional Governments can determine the number and type of health service facilities and grant permits to operate in their area by considering the area size, health needs, number and distribution of population, disease patterns, utilization, social functions, and capacity in utilize technology.

**Accessibility of Health Facilities**

According to Winardi (2002) the quality of health services has various dimensions, one of which is access. Health services are a convenient guarantee program or provide services provided both geographically, where access is related to transportation, distance and travel time. In this way, health services can be reached by people who need them. According to Kencanawati (in Greco, 2018), accessibility comes from the word accessibility in English, namely things that can be entered/ things that are easy to reach/ things that are easy to reach. Accessibility can be interpreted as the ease or affordability of an object on the surface of the earth. The level of accessibility is influenced by distance, the condition of transportation facilities and infrastructure such as road conditions and road width, the availability of various connecting facilities including their frequency and the level of security and comfort for using the route.

**Settlement pattern**

According to Wardiyatmoko (2006), settlement patterns are settlement distribution patterns that are influenced by geographical conditions such as land conditions, topography, distribution of natural resources. There are three settlement patterns, namely central (clustered), spread (random) and elongated (uniform).

**Accessibility in the Health Sector**

Increasing the level of public health can be achieved through increasing public access to health services. For this reason, one of the health development policies is directed at increasing the



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number, network and quality of hospitals. The provision of health service facilities needs to be supported by meeting the needs of health workers, facilities, equipment and health supplies that can support health services to the community (World Health Organization, 2010). According to Engel (in Greco, 2018) the ease of achieving access to health facilities is based on 3 things, namely: physical accessibility, economic accessibility and social accessibility: 1) Physical accessibility. Related to the availability of health services or distance to service users. It can be calculated from travel time, distance traveled, type of transportation and conditions in health services such as type of service, available health personnel and opening hours; 2) Economic accessibility. Judging from the financial capacity of the response to access health services. These are matters related to demand for health services; 3) Social accessibility. Includes non-physical conditions that can influence decision making about seeking health services. The physical conditions in question include the influence of the surrounding environment.

To better understand accessibility in the health sector, we have to relate it to one of the health infrastructures, such as accessibility in the hospital environment. Accessibility in the hospital environment is demonstrated by the ease with which patients receive treatment. This can be seen from the services provided and the public facilities available within a hospital environment. Service is an effort carried out by a group or person to provide assistance and convenience to the community in order to achieve a certain goal. Based on their service function, general hospitals are divided into three main service activities, namely: medical services, medical support services, and administrative services.

Medical services are individual services provided by medical personnel and nurses in the form of promotive, preventive, curative and rehabilitative services. Medical service activities, including examination activities, treatment and medical procedures such as operations/surgery including emergency care and inpatient activities. Medical support services. Medical support service activities are services whose function is to support medical activities. The activities in question include pharmaceutical installations, pathology/laboratory installations, nutrition installations, radiology installations, physiotherapy installations, and corpse care.

Administrative services. Hospital administrative service activities are management activities including administrative personnel, housekeeping, medical records, procurement and maintenance of equipment as well as educational and training activities including social activities. This administrative service is identical to the wages or costs that must be paid by the patient for the services obtained. The public facilities at the hospital consist of: room facilities and parking facilities. Space facilities. The provision of room facilities is based on activities that occur in general hospitals, namely the chemotherapy treatment process, medical rehabilitation, mental rehabilitation, and other service activities.

Parking facilities. Parking facilities are one of the facilities that must be available in every hospital or other public places. Parking requirements for hospitals include: a) Parking area for polyclinic/outpatient patients; b). Parking area for inpatient visitors; c). Parking area for hospital staff; d). Parking area for ambulances from both the emergency room and regular parking; e). Service parking area for loading and unloading of goods and hearses.

**Based on SNI 03-1733-2004 concerning urban settlement planning**

Nongsa District is one of the administrative areas of Batam City which consists of 12 sub-districts. Before the formation of Nongsa sub-district, this sub-district area was part of the old sub-district, namely East Batam sub-district and part of West Batam sub-district, specifically Sei Beduk Village, with the issuance of Law no. 53 of 1999 stipulated in Jakarta on October 4



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1999, the old Batam City area consisted of 3 (three) sub-districts, expanded into 8 (eight) sub-districts and then with the realization of Regional Regulation no. 2 of 2005 concerning the Expansion, Changes and Formation of Districts and Villages. In the Batam City area, Nongsa District only consists of 4 Villages. Splitting/dividing areas into new, smaller sub-districts and adapting them to population growth as well as social and economic development is part of the government's efforts to provide the best services more easily and efficiently, so that people in these areas will find it easier to manage the administration of both rights. as well as obligations as an individual, group, group or business entity. So that the government's ideals, which aim to improve the welfare of society, educate them and improve their character, will be easier. Nongsa District with the enactment of Regional Regulation no. 2 of 2005 consists of 4 subdistricts, namely Ngenang subdistrict, Kabil subdistrict, Batu Besar subdistrict and Sambau subdistrict

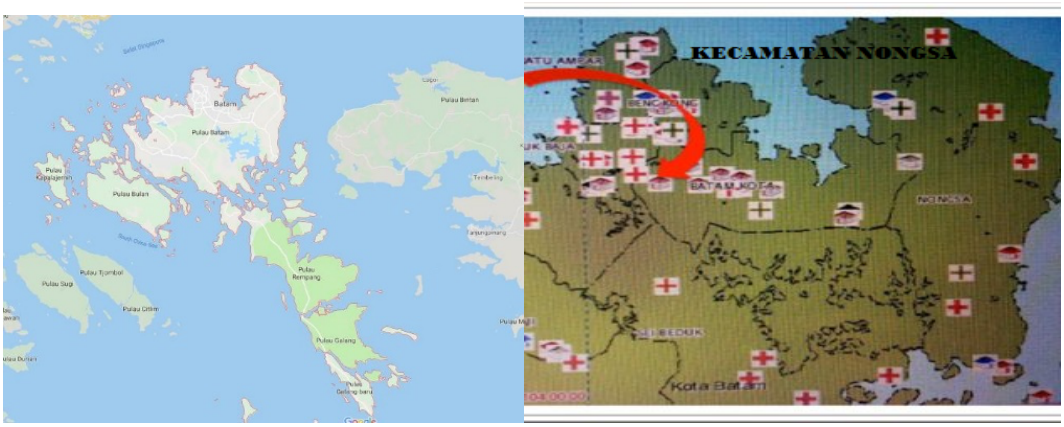


*Figure 2. Radius of Health Facilities Services*

Based on Figure 2, the service radius of puskesmas and pustu is not able to serve residential areas optimally. In contrast to the level of service, it is viewed based on the distance of service affordability as stated in SNI 03-1733-2004 that the service radius of the community health center unit is 3 km. The distribution of settlements is not located within the service radius of health facilities, so there are still many settlements that are still unserved. Moreover, the settlements in Nongsa sub-district are spread out.

**Data on the number of Health Facilities in Nongsa District**

Table 1. Analysis of Health Facilities Availability Based on Service Type

| Ward | Hospital | Maternity Hospital | Polyclinic | Public health center |
|---|---|---|---|---|
| Reminisce | 0 | 0 | 1 | 0 |
| Kabil | 0 | 0 | 5 | 1 |
| Big Stone | 1 | 0 | 7 | 1 |
| Sambau | 0 | 0 | 3 | 1 |

**Health infrastructure in regional planning**

Health infrastructure has a crucial role in regional planning. In the context of Batu Besar District, several aspects of health infrastructure that are relevant for regional planning involve:

***Accessibility***

Assess the sustainability of community accessibility to main health facilities such as hospitals and health centers.



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***Transport Network***

Analyze how the local transportation system supports the mobility of patients and health workers.

**Supporting *Infrastructure***

Check the availability of electricity, clean water and sanitation required for the operation of health facilities.

***Health Service Zoning***

Determine health service zones to ensure equitable and efficient distribution of health facilities.

***Environmental Health Risk Mapping***

Evaluate potential environmental health risks and design appropriate mitigation solutions. By taking these aspects into account, regional planning can support the development of optimal and sustainable health infrastructure in Batu Besar District.

**The role of health facilities in Batu Besar sub-district**

Health facilities in Batu Besar Village have an important role in providing health services to local residents. Some of the main roles of health facilities in the subdistrict involve:

***Primary Health Care***

Providing basic health services such as immunizations, routine health checks, and treatment of common illnesses.

***Public Health Education***

Carrying out outreach activities to increase public understanding about healthy lifestyles, disease prevention and preventive health measures.

***Emergency Response***

Providing a quick response in handling health emergencies and first aid for accidents or sudden illnesses.

***Collaboration with the Community***

Participate in community health programs and collaborate with related parties to improve community health.

***Environmental Health Monitoring***

Monitor environmental health conditions in Batu Besar Village to prevent the spread of disease and other health risks. By playing an active role at the sub-district level, health facilities can become the backbone in maintaining holistic community health and supporting government efforts to improve the welfare of residents.

**Comissionary Data from Research Results**

Table 2. Distribution of Medical Personnel Performance Assessment Levels Based on Respondents' Perceptions

| Medical personnel | | | | | |
|---|---|---|---|---|---|
| | | **Frequency** | **Percent** | **Valid Percent** | **Cumulative Percent** |
| Valid | Not good | 1 | 2.5 | 2.5 | 2.5 |



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| | | | | | |
|---|---|---|---|---|---|
| | Pretty good | 12 | 30.0 | 30.0 | 32.5 |
| | Good | 20 | 50.0 | 50.0 | 82.5 |
| | Very good | 7 | 17.5 | 17.5 | 100.0 |
| | **Total** | **40** | **100.0** | **100.0** | |

The majority of respondents felt that the quality of medical personnel services for the general public in Batu Besar Village was good. This was proven by the number of respondents amounting to 50%.

Table 3. Distribution of Administrative Service Assessment Levels

| **Administrative_Services** | | | | | |
|---|---|---|---|---|---|
| | | **Frequency** | **Percent** | **Valid Percent** | **Cumulative Percent** |
| Valid | .00 | 1 | 2.5 | 2.5 | 2.5 |
| | Not good | 1 | 2.5 | 2.5 | 5.0 |
| | Pretty good | 18 | 45.0 | 45.0 | 50.0 |
| | Good | 18 | 45.0 | 45.0 | 95.0 |
| | Very good | 2 | 5.0 | 5.0 | 100.0 |
| | **Total** | **40** | **100.0** | **100.0** | |

The majority of respondents felt that the quality of administrative services for the general public in Batu Besar Village was good, this was proven by the number of respondents, 45%.

Table 4. Frequency Distribution of Pharmacist Service Assessment

| **Pharmacist_Services** | | | | | |
|---|---|---|---|---|---|
| | | **Frequency** | **Percent** | **Valid Percent** | **Cumulative Percent** |
| Valid | .00 | 1 | 2.5 | 2.5 | 2.5 |
| | Not good | 1 | 2.5 | 2.5 | 5.0 |
| | Pretty good | 19 | 47.5 | 47.5 | 52.5 |
| | Good | 15 | 37.5 | 37.5 | 90.0 |
| | Very good | 4 | 10.0 | 10.0 | 100.0 |
| | **Total** | **40** | **100.0** | **100.0** | |

The majority of respondents felt that the quality of pharmacist services for the general public in Batu Besar Village was quite good, this was proven by the number of respondents, 47.5%.

Table 5. Distribution of Respondents' Assessment of BPJS Service Quality"

| **BPJS_services** | | | | | |
|---|---|---|---|---|---|
| | | **Frequency** | **Percent** | **Valid Percent** | **Cumulative Percent** |
| Valid | .00 | 1 | 2.5 | 2.5 | 2.5 |
| | Not good | 1 | 2.5 | 2.5 | 5.0 |
| | Pretty good | 21 | 52.5 | 52.5 | 57.5 |
| | Good | 15 | 37.5 | 37.5 | 95.0 |
| | Very good | 2 | 5.0 | 5.0 | 100.0 |
| | **Total** | **40** | **100.0** | **100.0** | |



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The majority of respondents felt that the quality of BPJS services for the general public in Batu Besar Village was quite good, this was proven by the number of respondents, 52.5%.

Table 6. Distribution of Performance Appraisal by Nursing Assistant in Hospital

| Nursing Assistant | | | | | |
|---|---|---|---|---|---|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Pretty good | 5 | 25 | 25.0 | 25.0 |
| | Good | 14 | 70 | 70.0 | 95.0 |
| | Very good | 1 | 5 | 5.0 | 100.0 |
| | **Total** | **20** | **100.0** | **100.0** | |
| **Total** | | **20** | **100.0** | | |

The majority of respondents felt that the quality of nursing service for the general public in Batu Besar Village was good, this was proven by the number of respondents, 70%.

Table 7. Evaluation of Perception of Facilities and Equipment: Analysis of Respondents' Satisfaction Levels

| FacilitiesEquipment | | | | | |
|---|---|---|---|---|---|
| | | **Frequency** | **Percent** | **Valid Percent** | **Cumulative Percent** |
| Valid | Not good | 1 | 5.0 | 5.0 | 5.0 |
| | Pretty good | 5 | 25.0 | 25.0 | 30.0 |
| | Good | 13 | 65.0 | 65.0 | 95.0 |
| | Very good | 1 | 5.0 | 5.0 | 100.0 |
| | **Total** | **20** | **100.0** | **100.0** | |
| **Total** | | **20** | **100.0** | | |

The majority of respondents felt that the equipment facilities for the general public in Batu Besar Village were good. This was proven by the number of respondents as many as 65%

Table 8. Distribution of Employee Perceptions of Room Facilities

| Room Facilities | | | | | |
|---|---|---|---|---|---|
| | | **Frequency** | **Percent** | **Valid Percent** | **Cumulative Percent** |
| Valid | Good | 8 | 40.0 | 40.0 | 40.0 |
| | Pretty good | 12 | 60.0 | 60.0 | 100.0 |
| | **Total** | **20** | **100.0** | **100.0** | |
| **Total** | | **20** | **100.0** | | |

Information:

The majority of respondents felt that the room facilities for the general public in Batu Besar Village were quite good, this was proven by the number of respondents as much as 60%.

Table 9. Parking Quality Evaluation Based on User Feedback: Findings and Implications

| Parking | | | | | |
|---|---|---|---|---|---|
| | | **Frequency** | **Percent** | **Valid Percent** | **Cumulative Percent** |
| Valid | Not good | 1 | 5.0 | 5.0 | 5.0 |



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| | | | | | |
|---|---|---|---|---|---|
| | Pretty good | 6 | 30.0 | 30.0 | 35.0 |
| | Good | 5 | 25.0 | 25.0 | 60.0 |
| | Very good | 8 | 40.0 | 40.0 | 100.0 |
| | **Total** | **20** | **100.0** | **100.0** | |
| **Total** | | **20** | **100.0** | | |

The majority of respondents felt that the parking facilities for the general public in Batu Besar Village were very good, this was proven by the number of respondents amounting to 40%.

As for the total number of Tawasul number of users and SMSs sent over 12 months, the two administrators at the Deanship of eTransactions and the statistics obtained from the Deanship indicated that between December 2018 and November 2019, a total of 7,672,553 SMS were sent to a total of 63,759 recipients at KSU. The total number of users ranged between 4,492 and 6,682, and a range of 210,008 to 868,298 messages a month, with a median of 5203 users and a median of 684,682 SMSs sent (See Tables 1 & 2; Table 1). They added each message sent via the Tawasul SMS Service costs about SR0.08 per SMS, with a total of SR1,000,000 so far. All paid by the University.

Table 10. Mean, Median and Range of SMS Users Per Month and Total SMS Per Month

| | **Mean** | **Median** | **Range** |
|---|---|---|---|
| Total Users | 5313 | 5203 | 4,492 to 6,682 |
| Total SMS | 639,379 | 684,682 | 210,008 to 868,298 |

**Advantages of Tawasul as Perceived by Participants**

Participants reported that the Tawasul online SMS Service is free for faculty, administrators, and students at KSU. It is easy to use. Users can send an SMS in English and Arabic and can switch languages very easily. KSU faculty, administrators, and students do not need to register in Tawasul. They can use their university username and password to log into Tawasul. The Tawasul System is faster and more efficient than paper memos, phone calls, e-mails, especially in emergency situations. It helps conserve paper. Students and faculty can be reached anytime, anywhere and 24/7. Unused SMSs can be added to the user's balance. The SMSs sent by a user are archived. Students' mobile phone numbers are entered manually once, and students registered in a course are saved as a group. Those interested in joining a group can send an SMS to the group administrator's mobile number. If the SMS is irrelevant, the user does not like it or does not need it, he/she can easily delete it.

The Tawasul SMS Service is an additional effective communication channel between faculty, staff, administrators and students. It facilitates coordination of administrative tasks (meetings, announcements and reminders). It is an additional public relations/announcement tool, keeping interested users posted about important developments. It is used for quick announcements of university events. Tawasul makes is easy for Students' Affairs and Registration Deanships and college deans to reach students anytime, especially in the case of an emergency. For example, when we had torrential rains, an SMS was sent 11 p.m. notifying all faculty and students at KSU of the suspension of classes the following day.

**Shortcomings of Tawasul as Perceived by Participants**

The participants indicated that the allocated 200 free SMSs per month are not enough when class enrollees are more than 50 students. It is not possible for the message recipient to send a reply, a comment, or a query to the sender of the SMS, i.e., SMSs are sent one way. The sender's cell number remains anonymous. Sometimes the service cannot be used when Tawasul is under maintenance or when it has some technical problems. Some users misuse it. Some use



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it for personal non-academic or administrative use. Arabic SMSs are more expensive than English SMS because 1 English SMS is 160 characters long, whereas 1 Arabic SMS is 70 characters long. Some use lengthy, verbose SMSs with unnecessary headers (being unaware of the overall cost of such SMSs). When a message is long, some recipients get part of it only.

The participants indicated that Tawasul SMS System places an extra burden to secretaries, system operators and administrator as they spend additional time on the system (among other systems at KSU). The new version requires that students' names and cell numbers be entered one by one manually. This is time-consuming. The instructor cannot copy and paste cell numbers and cannot use commas or semi-colons as separators. No way to import names and cell numbers from Edugate. The students can also enroll themselves and enter their cell numbers in an instructor's group using a group code. Some students do not enroll themselves at all, thus do not receive any SMS.

The advantages of the Tawasul SMS System reported in the present study are consistent with findings of prior studies such as Brett (2011); Tang & Heew (2017) on the utilization and benefits of SMS and other instant messaging technologies which indicated that the relative advantage and ease of use of SMS are important factors that significantly influence mobile users' adoption of SMS. However, results of the presents study showed no pedagogical and language learning uses of the Tawasul System, which is inconsistent with prior studies such as Viljoen et al., 2005); Lim et al., 2011); Geertsema et al., 2011); Cavus & Ibrahim (2009); Kennedy & Levy (2008); Librero et al., 2007); Kert (2011); Plana et al., 2012); Lin & Rivera-Sanchez (2012); Goh & Hooper (2007). Lack of pedagogical and language learning uses of SMS in the present study may be attributed to lack of experience on the part of the instructors with regards to the instructional uses of SMS, what language learning tips, activities, questions, and group feedback they can send and how they can encourage and support students' language learning. The limited number of free SMSs allocated to them every month may not be enough to send pedagogical tips. The instructors probably have not been introduced to the pedagogical uses of SMS and may not have received any training in that. They might not be willing to put extra time and effort in searching for and sending pedagogical SMSs. Furthermore, the shortcomings of the Tawasul System are similar to those reported by Brett (2011). Brett (2011) added further shortcomings of SMS such as intrusion into personal time, the culture of immediacy in texting, costs, and lack of perceived pedagogic benefit. Such shortcomings were not reported by participants in the present study.

## Conclusion

Quality of Service for the Community in Batu Besar Village. How to improve Human Resources regarding health services for residents of Batu Besar sub-district, Nongsa sub-district. The quality of buildings and health care in the Batu Besar sub-district area. How are Facilities and Infrastructure providing health facilities evenly through government programs, namely the Batam City Health Service. Based on a survey conducted by directly observing the research location, the quality of health services at the Community Health Center or health clinic for the community in Batu Besar Village is very good. The quality of buildings and health care for the Batu Besar sub-district, Nongsa sub-district, Batam city is good.

## Suggestion

For future researchers to expand and increase research samples such as district/city governments outside Batam City and renew the observation period. For the next researcher to add variables that influence the Infrastructure Development variable for Public Health service facilities and infrastructure



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