How to Cite:
Sasikala. (2022). A retrospective observational study of maternal and perinatal morbidity and mortality in COVID-19 positive obstetrics patients in tertiary care centre. *International Journal of Health Sciences*, *6*(S7), 1180–1189. https://doi.org/10.53730/ijhs.v6nS7.11435

A retrospective observational study of maternal and perinatal morbidity and mortality in COVID-19 positive obstetrics patients in tertiary care centre

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***Abstract*---**Introduction: Corona virus disease (COVID-19) is an infectious disease caused by a newly discovered corona virus. As pregnant women are placed in the vulnerable group for COVID-19, how to provide proper antenatal services is a big question. Access to routine antenatal care was affected more when government authorities came up with restrictions regarding social distancing, personal protective equipment, travel restrictions, quarantine policies etc. Restrictions along with fear of infection have further increased anxiety and obsessive compulsion symptoms among the pregnant women. The aim and objective was to study clinical profile of patients presented with medical disorders in COVID-19 positive pregnant women. Materials and Methods: The present retrospective study was conducted in the Department of Obstetrics and Gynecology, Velammal Medical College, Madurai. Study reviewed the medical records of all pregnant patients who were admitted to obstetrics and gynaecology department with pre-existing medical disorders or those suspected with medical disorders on the basis of clinical and/or laboratory data from 1 March 2020 through 28 February 2021. All pregnant women admitted with medical disorders from time of diagnosis of COVID-19 positive pregnancy till delivery was included. Results: Maternal age ranged from 21 to 37 years with a mean age (SD) of 25.13±4.15 years with age range of 20-35 years. Mean period of gestation at the time of enrollment in the study was 33.26±8.40. As per routine protocol/as per hospital policy, RT-PCR were conducted for all patients presented in OPD, a total of 66 (66%) were found to be COVID-19 positive due to close contact. A total of 58 (58%) women were found to be asymptomatic and 34 (34%) had various other COVID-19 symptoms. On respiratory examination, a total of 82 women found to be asymptomatic/mild symptoms with RR <24 /m and SpO2>94% in room air and 18 women symptomatic with mild to moderate

pneumonia. Conclusion: In the present retrospective COHORT study, the majority of the pregnant women with COVID-19 infection had mild symptoms with no severe illness. Mother-to-child transmission of COVID-19 cannot be ruled out. The impacts of COVID-19 infection on patients with medical disorders during pregnancy were seen.

***Keywords*---**Corona virus disease, SpO2, RT-PCR, pulmonary infection

Introduction

In Iran, high energy consumption relative to the global average and the use of non-renewable resources such as oil and gas on the one hand and identity crisis in architecture on the other hand, the need to move towards sustainable development is necessary. In order to achieve this, the necessary infrastructure should be provided. One of the most important issues is the development of systems for evaluating and controlling this development (Nakran, Buyidh, and Tavakoli, 2012). The implementation of such standards in our country can also solve many urban and traffic issues and save fuel consumption and non-renewable first sources, control air pollution, minimize construction waste and many other environmental issues.

Most ranking systems try to take a comprehensive approach to the efficiency and performance of the building or society, while some of these systems only take into account aspects that are easier to access or evaluate. Rating systems help users set targets and make decisions, encouraging owners and residents to work together. These systems may at the same time provide suggestions on how to combine green elements in the design and implementation of buildings with flexible criteria. Although the criteria and ranking systems of sustainable buildings may pursue common goals, their structure is quite different.Ranking systems are not designed as building criteria, but they can be modified to meet the desired criteria (Zuo &Zhao, .(2014

In 1988, the UK BRE Building Research Institute established the world's first sustainable building assessment system, the Building Environmental Assessment Methodology Research Institute, which was launched in 1990. Almost two decades later, hundreds of mandatory and voluntary evaluation systems became available for buildings, products and technology around the world. Tim Somas, head of the Institute for Sustainable Infrastructure Evaluation, reported that when they designed the Anvision Assessment System in 2011, more than 900 different scoring systems were known for sustainable infrastructure worldwide (Poston, Emmanuel, Thomson, 2010).

What has created several different systems in the world is that evaluation systems are mostly national or even international, while the concept of sustainability pays particular attention to local conditions and issues. Although nature generally has a common sense of life on Earth, local conditions make this feeling completely different in detail (Farzadipur and Ehsanimehr, 2015) The hypothesis of the

research ahead is that global environmental assessment models such as LEED, BREEAM, CASBEE, etc. Currently used, they are not adaptable to climatic diversity as well as social, cultural and environmental conditions of Iran.

According to the research subject, in order to feasibility study of generalization of evaluation systems for Iran (cold and dry climate), the research structure is based on comparative approach and comparison of evaluation criteria and their classification. The advantage of this structure is the possibility of accurate identification of criteria and extraction of the basics and concepts in the systems. Furthermore, the study of the research background in this field shows the widespread application of this method in similar researches in the past. In general, the research process takes place in two parts: the first part introduces existing evaluation systems and then examines the systems designed as international systems or with regional coefficients and indicators as international indicators.

In the second part of the research, which relies on the findings of the first part, the necessity of localization of sustainability indicators according to climatic indicators has been discussed and its aim is to explore the relationship between regional indicators with weighting and selection of criteria in systems developed as international system. Data collection method has been done in two sections through library studies, reviewing existing articles and researches and analyzing them by analytical-descriptive method.

Reviewing theoretical foundations and backgrounds

Iran has different climates. 33% of the country's total climate is cold and dry. One of the most important factors affecting the design of cities is climate, as its impact on the texture, form of the city and the tektak of buildings of a city can be seen. The study of climatic studies and sustainability indicates the necessity of paying attention to sustainable architecture in Iran, especially in cold and dry climates, because the highest energy consumption and consequently its waste, especially in cold seasons, can be seen in this climate. Other than that, the climatic conditions of the region are behagons, which can also be used for renewable energy.

Shahin Heidari in a research provides the results of comparison of different temperatures in Tabriz (case study of cold and dry climate metropolises). The results of this study show that in a city that was selected as a study sample, assuming appropriate climatic design, how much active equipment is needed (Heidari & Ghaffari, 2010). Kazemi et al. have also investigated the impact of sustainable design in cold and mountainous climates of Iran. The results of this study show that understanding the importance of the role of vernacular architecture leads to a sustainable approach in architecture and by studying and recognizing the climatic characteristics of the region and presenting appropriate and coordinated plans with climate, it is important to increase the quality of space and save energy and cost (Cocoon VaroutanDust, Tehranifar & Kazemi, 2018).

It can be said that climatic factors are the most important factors that affect constructions at all times and places and are one of the main factors in the

formation of vernacular architecture, which is why sustainable architecture pays attention to climatic design and vernacular architecture.

What has been studied in this study is the indispensability of systems (even systems that were developed internationally with regional coefficients) to other countries and climates. On the other hand, some general criteria have been seen in these systems that measure global challenges and priorities. This does not include the challenges of regional, social, cultural and climatic wisdom.

In order to formulate specific indicators for Saudi Arabia in its article, Abu Niama points to the index as well as the general index, stating that the priorities of the Middle East are different from europe and the United States, and as a result, their regional characteristics will be different. For example, as mentioned in the LEED system, it will be privileged to create bicycle facilities (park locations, tracks, etc.) in the building, while in a buffer area like Saudi Arabia, bicycle use will not make much sense (Abunimah, 2012).

This study aimed to express a new concept of evaluation system in accordance with local, regional and climatic needs, while many studies have tried to modify the system and change the coefficients according to the specific conditions of the region. This research tries to first analyze the basis of the production of stability assessment systems and the roots of weighting of international systems to prove the native nature and regionality of these systems and then, according to the basic indicators of stability, develop stability standards in the formation of cold and dry climate structure and architectural elements.

The summation of the researches indicates that despite many and scattered studies on the investigation and analysis of evaluation systems, especially on regional and local and climatic effects on the process of system formation and weighting of these systems, there has not been a codified study. Therefore, this research is new in terms of explaining the effect of local and climatic conditions on the design and scoring process of existing and new evaluation systems.
Although the criteria and ranking systems of sustainable buildings may pursue common goals, their structure is quite different.

2.2 Comparison of headings and criteria in a variety of evaluation systems

In each building, a specific combination of factors affects decisions to follow up on the acquisition of one or more green building ranking certificates. This section identifies factors that increase the willingness of building owners or users to use evaluation and ranking systems. In general, the factors influencing the use of green building sustainability assessment systems are: 1. Legislative requirements, 2. Investor, owner or tenant, 3. Creating an economy, 4. Market dynamics, 5. Motive and 6. Risk Management (Nguyen, 2019).

- Legislative requirements

There are policies at the national/federal, provincial/state and municipal levels around the world. These requirements may refer to local green management and include standards or guidelines for green building, or may refer to international

systems. These requirements can take many forms: 1. Mandatory federal or regional requirements for estimated energy and 2. Water consumption. In Australia, for example, commercial buildings (CBD) require energy efficiency information, which in most cases when a business office space of 2,000 meters or more is suggested, the NABERS grading system is used, or for example, certain building uses must necessarily receive energy labels under EU rules.

Federal, state/municipal laws can mandate sustainable elements consistent with one or more indicators of sustainability system requirements. For example, in several countries the production or import of tungsten lamps is prohibited (Kubba, 2012). In some cases, the requirements of the municipality, or at least the standard for obtaining a building permit application, are directly connected to one of the local or international sustainable assessment standards.

- Investor, owner or tenant

Many investors, owners and builders use sustainable evaluation systems to build or operate sustainable buildings. Also, many tenants want sustainability policies or green lease policies and only want to enter the space approved by sustainable development organizations. These requirements make the ranked buildings valuable by sustainable evaluation systems. In 2013, for example, the U.S. Office of Public Service (GSA) ordered that all new federal buildings must obtain a gold certificate. In addition to these rulings, most tenants prefer approved buildings due to reduced consumption costs and improved indoor quality. This indicates that adding a target or prerequisite requirements for any type of user and considering how choosing a suitable target can reduce the cost of building life cycle in different ways is effective in increasing users' motivation to choose evaluation systems for ranking their buildings (Alyami, 2014).

2-5- Market Dynamics

Market dynamics derive from the commercial benefits of each system to obtain a certificate. These certificates facilitate common language in the industry for competitive purposes. In addition, in many markets, higher than usual certificates generally lead to improved absorption and increased rent rates. Basically, in countries or regions where rating systems are used to measure building productivity, there is little agreement on the best method of evaluation, however, the buying and selling status of real estate in several markets indicates a certain priority for renting buildings with a certain level of certification. This leaves fewer buildings with sustainability certificates empty and has also increased rents.

2-5- Market Dynamics

- Motivation

There are thousands of world-class incentive programmes, and each building meets certain requirements based on location, size, texture and type. Incentives are usually provided by federal or state government agencies or municipal service providers and entities. These points are categorized in different levels:

1. Zoning: The Hong Kong and Singapore Tax Authority, for example, allow builders of green and sustainable construction permits to increase the percentage of building occupancy
2. . The LEED system provides special privileges for the state of Texas on water efficiency equipment or water pump equipment for new chillers and other equipment that consume less water or consume less energy.
3. 3. Tax benefits: For example, the Government of Canada has considered a tax cut for renewable electricity generation equipment to improve return periods (Berezin, Gozolchiani, Guez, & Havlin, 2012).

- Risk Management

Credits for stability rating systems are obtained based on features that reduce the risks of buildings for owners or users. These requirements are: 1. Ensuring the operation and efficiency of the building within the projected framework, 2. Delivery of all documents (providing documentation and micro-details of equipment used in the building for their use to repair or replace equipment, real-time control and approvals of building systems for monitoring energy and water consumption, and knowing the quality of equipment to clarify the location of possible defects or places of water or energy loss, and 3. Reducing dependence on conventional energy resources through site production that has flexibility. Increases equipment in case of water or electricity outage (Roinila, Messo, & Santi, 2017).

- Decision-making framework

This framework includes questions that will be possible for any project to answer. A set of questions has been designed to assess the factors related to benefits and costs in order to use the potentials. This framework consists of two flowcharts. The first flowchart is a guide to the process of identifying the primary stability certificate system and target ranking. In many places the local standard may be a legal requirement and a means of identification at this stage (Kim & Todorovic, 2013). The second flowchart is used after identifying whether a second certificate is useful for the project. Comparing global sustainability systems before using the framework, the following first questions must be answered:

1. Where is the project located (country, city, neighborhood)?
2. What legal requirements exist in this location?
3. What are the local market dynamics for new construction?
4. Who invests in this building?

When this information is specified, the second flowchart can be used.

Solutions for localization of existing sustainability assessment systems

2-9-3-1- LEED Localization Solutions

LEED provides the Regional Priority Criterion (RP) for system generality in order to pay attention to the specific conditions of the field, unlike upgrading regional priority standards in version 4 compared to the previous version, it still needs to

be. Using local experts to form a more complete adaptation to local conditions so that these criteria can reflect the real conditions of the region from the perspective of climatic diversity, economic, technical, cultural and historical issues (Nguyen, 2019).

Analysis conducted by Suzor on RP criteria in four countries scattered around the world such as Canada, Turkey, China and Egypt shows. Definition of these priorities has not been based on the real conditions of countries and their necessities and cannot play an effective role in environmental evaluation of those countries. For example, for the whole of Iran, which has been added to the list of this database from version 4, Regardless of its climatic diversity, only one set of criteria under six titles of renewable energy production, optimizing energy consumption, thermal comfort, reducing thermal island, reducing water consumption Foreign and reduced domestic water consumption, which is very similar to the criteria set by USGBC for countries on the Persian Gulf, has been presented (Paintings, Buyids and Tavakoli, 2017). On the other hand, disregard for cultural, economic and social diversity in the list of criteria confirms the necessity of reviewing it, because there are definitely significant differences between the regional priorities of the two cities with the density of population and the rate of urban development and by default being in the same climate. It should be noted that even with the correct assumption and comprehensiveness of these criteria, since the regional priority criterion is merely an encouraging criterion and only 63.3% of the total score received, it cannot actually play an effective role in considering regional conditions in this system.

Necessity of localization of evaluation system based on priorities of cold and arid climate regions of Iran

One of the methods to increase the efficiency of sustainable building evaluation systems is localization and design of regional systems specific to each region and climate. For each region, according to local and climatic infrastructures, systematic frameworks can be presented to improve their productivity. There are also consensuss in some frameworks around the world. Even among organizations committed to environmental goals, appropriate strategies and measures have been taken to create effective activities in sustainable buildings. Considering this, the impact of the construction industry and architecture on creating high potential for sustainable development is also very important. Considering that sustainability is a valuable and at the same time very broad and complex concept, it can be said that evaluation systems are one of the major sustainability issues and increase the quality of life of people in a healthy environment with social, economic and sustainable conditions (*Gallyamova, Z. V., et. al., 2019; Algahtani, F. D., 2020*).

Findings

Considering the local and climatic indicators and the existing international indicators, it is possible to extract the effective indicators in the development of a system for evaluating sustainable cold and dry climate buildings. These indicators were evaluated and weighed by Delphi technique. Weighting is a practical strategy

in which bed conditions are prioritized and this system is the foundation of all environmental assessment initiatives (Cole, 2005).

The indicators of Iran's cold and dry climate assessment system were analyzed using a hierarchical model based on the extraction of sustainability indicators in the sustainability assessment systems, and as a result, an evaluation model was constructed based on the consensus of 25 experts (called delphi panel). This paired comparison was conducted to prioritize and categorize the indices based on the texture of cold and dry region of Iran. Topsis solver software is used to validate the model.

Discussion & Conclusions

According to the findings of the study, it can be said that while using existing systems and their executive experiences in the form of reference and model of the compilation of the ecosystem, the necessity of prioriting the criteria of international systems based on regional conditions in order to deal with local challenges can also be seen.

In all evaluation systems, there are points of difference and similarity, and each system has its own limitations and may not be used for all regional projects and other specific aspects such as the quality of the indoor environment. These systems often employ different evaluation criteria, methods and stages. Each system has its own advantages and shortcomings, but due to the differences between them, most systems use the same criteria for evaluation and ranking. Similarities include: 1. Reduction of energy consumption, 2. Emissions, 3. Adjustment of weighting by user as well as differences are: 1. Difference of criteria, 2. Differences in weighting patterns, 3. Pattern assigns scores.

To achieve a comprehensive perspective on the design of ranking systems, evaluating criteria can be divided into 4 categories:

1. Criteria indicating the impact of construction on the environment: sustainable site, materials, water, energy, management, waste.
2. Criteria indicating the impact of construction on humans: indoor quality (thermal comfort, visual comfort, acoustics, etc.) - Health- Security.
3. Criteria resulting from the impact of outdoor environment on sustainability: innovation in design, climatic design, native and traditional design
4. Economic criteria.

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