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Proposed Program On Energy Savings and Reduce Consumption In China Medical University Stomatology Hospital, Shenyang, China

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Abstract: This study examines energy conservation practices in hospitals, focusing on the perceived effectiveness and implementation of energy-saving measures such as HVAC efficiency, building insulation, renewable energy adoption, and smart energy management systems (EMS). Analysis reveals that respondents prioritize structural improvements and technology-driven solutions, viewing enhanced insulation, reflective roofing, and smart EMS as highly effective in reducing heating, cooling, and lighting demands. HVAC systems were identified as major energy consumers, often accounting for over 50% of hospital energy use, with strong support for energy-efficient upgrades and renewable energy integration to offset these demands.

Demographic analysis showed slight perceptual differences, with female respondents and mid-career professionals rating energy-saving technologies more favorably, particularly smart EMS. Correlation analysis highlighted significant associations between energy-saving measures and specific consumption areas: enhanced insulation correlated with reduced heating needs, and renewable energy adoption was positively linked to lower energy usage in lighting, cooking, and equipment. Overall, the study underscores the importance of a multifaceted energy conservation approach that combines sustainable building practices, advanced technology, and staff engagement, presenting a targeted program to improve energy efficiency and reduce operational costs in hospitals.

Keywords: Energy Conservation, Hospitals, HVAC Efficiency, Building Insulation, Renewable Energy

Introduction

"China's progress in implementing mandatory energy efficiency policies over the past decade has made it the world's energy efficiency heavyweight." — IEA, Energy Efficiency in China (February 2021)[1]

China's economy is energy-intensive. In 2021, only seven countries in the world used more energy per unit of GDP than China. The energy intensity of China's economy is due to several factors, including the high share of heavy manufacturing in China's economy and lack of market signals to motivate energy efficiency in some sectors. 2

The energy intensity of the Chinese economy has improved dramatically in the past several decades. Between 1990 and 2020, energy use per unit of GDP in China fell by roughly 75%.

The steady improvement in China's energy intensity has been caused by structural changes in the economy as services and light industry grow, as well as regulation-induced energy efficiency improvements. The industrial sector has had the greatest energy savings, mainly in response to government mandates. Energy appliance standards and labeling have played an important role, as have energy service companies (ESCOs). The deployment of smart meters to drive demand response is only recent but growing rapidly. The central government has continued to introduce measures to improve the energy efficiency of buildings.

China's energy efficiency gains have had an enormous impact on energy use and emissions of heat-trapping gases. The International Energy Agency estimates that energy efficiency improvements since 2010 have cut energy consumption by 20%; energy efficiency improvements between 2000 and 2017 reduced China's 2017 emissions by nearly 1.2 Gt CO_2e (roughly equal to Japan's 2017 emissions).

Policies

In 2018, more than 60% of China's energy use was covered by mandatory energy efficiency policies—more than any other nation in the world.

Improving energy efficiency is a long-standing goal of the Chinese government. Most Five-Year Plans since the 1980s have included energy intensity goals for the Chinese economy. The 11th Five-Year Plan (2006 – 2010) contained especially strong provisions, with a mandatory national target to reduce energy intensity 20% below 2005 levels by 2010. The 12th Five-Year Plan (2011–2015) contained a mandatory national target to reduce energy intensity 16% below 2010 levels by 2015. Both these targets were met or almost met.

The 13th Five-Year Plan (2016–2020) contained a mandatory national target to reduce energy intensity 15% below 2015 levels by 2020. This target was missed when energy intensity improved only 13.2%, due in part to the focus on energy-intensive industries in post-COVID economic recovery programs.

The 13th Five-Year Plan also introduced the Dual Control policy, which set caps for total energy consumption and energy intensity for provinces, municipalities and autonomous regions. These sub-national governments would then set annual Dual Control targets and establish mechanisms to achieve those targets, focusing on energy-intensive industries. In

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August 2021, the National Development and Reform Commission (NDRC) identified ten provinces that were not on track to meet one or both of their annual Dual Control targets for 2021.
The 14th Five-Year Plan (2021–2025) contains a mandatory national target to reduce energy intensity 13.5% below 2020 levels by 2025.
As the energy intensity of an economy improves, easier ways of saving energy are implemented and more challenging ways remain. If energy intensity improves by 15% in one five-year period, a 15% improvement in the next five-year period would require more effort than in the first. As a result, the successive energy intensity improvement targets in recent Five-Year Plans — from 20% to 16% to 15% to 13.5% — do not represent diminished ambition on the part of Chinese energy planners. Instead, those targets represent roughly constant ambition in improving energy intensity over time.
The State Council highlighted the importance of energy efficiency in several policy documents published in late 2021 and early 2022. It drew attention to the need for energy efficiency improvements in sectors including heavy industry, building materials, coal, transport, appliances and urban design. The State Council also highlighted the need to continue with the Dual Control mechanism. 11
NDRC's 14th Five-Year Plan for a Modern Energy System repeats the energy intensity target in the overarching 14th Five-Year Plan published in March 2021. It sets no cap on total energy consumption, but mentions the need to improve the Dual Control mechanism.
Chinese government attaches great importance to energy conservation, taking resource saving as the basic state policy, developing and saving energy simultaneously, and giving priority to energy saving.
China takes building a resource-saving and environment-friendly society as a significant strategic task in the Outline of the Eleventh Five-year Plan, aims to reduce energy consumption for unit GDP by 20% in 2010 over that in 2005, and regards this as a binding target.
As a developing country, China still falls behind in economic development and people's living level. Due to the quick industrialization and urbanization, it now has a huge demand for energy. But the energy utilization efficiency should be lifted. Saving energy and lifting energy efficiency is a significant strategic task concerning the modernization and long-term development of China and also an urgent task that China is faced with currently.
From 1981 to 2005, China had reported annual average growths of 9.8% and 5.4% in GDP and total energy consumption respectively. Energy consumption for unit GDP declined 64% accumulatively. From 2005 to 2008, China had reported a decline of 12.45% in energy consumption for unit GDP, and rate further dropped by 4.03% in the first half of 2009. It is expected that we can achieve the goal of reducing energy consumption for unit GDP by around 20% in the period of the "Eleventh Five-year Plan".

Literature Review

Energy efficiency in healthcare institutions

The Environmental Protection Agency classifies healthcare as one of the leading energy-consuming industries. Extensive energy is needed around the clock in healthcare institutions for lighting, ventilation, and operating medical equipment. However, there is a growing concern over the sustainability of energy utilization by healthcare institutions worldwide. This narrative review thus seeks to examine energy efficiency and utilization in healthcare institutions and energy management and conservation techniques and make recommendations for future optimal usage. The paper notes that healthcare institutions use different quantities of energy from diverse sources, including hydropower, biomass, solar energy, and wind power. However, energy consumption varies from one institution to another, with the number of beds and intensity of healthcare operations, with an average of 0.27 MWh m^{-2}. Moreover, this review also identified various techniques and measures to enhance energy efficiency, such as the variant refrigerant flow technology and the combination of renewable energy sources with diesel generators to reduce the cost of electricity. Overall, healthcare institutions need energy management systems such as automated energy monitoring technologies, to check the systems' efficiency. The same techniques can also help Middle Eastern healthcare institutions with efficient energy utilization. Ultimately, the literature review aims to introduce an approach that focuses on reducing site-level consumption of energy while increasing the quality of the energy used and hence, helping reduce energy costs while conserving the environment.

Statement of the Problem

This study will be conducted to assess the Proposed Policy on Energy Savings and Reduce Consumption in China Medical University Stomatology Hospital, Shenyang, China with end view of a proposed program for energy conservation. Specifically, it will answer the following:

1.What is the assessment of respondents on the energy savings in terms of the following:
1.1space heating,
1.2cooling,
1.3ventilation,
1.4steam production,
1.5equipment usage,
1.6lighting, cooking, and
1.7domestic hot water
2.Is there significant difference in the assessment of respondents on the energy savings?
3.What is the assessment of respondents on the energy consumption in terms of the following:

3.1Implement Energy-Efficient HVAC Systems,
3.2 Adopt Renewable Energy Sources,
3.3 Enhance Building Insulation and Design, and
3.4Deploy Smart Energy Management Systems?
4.Is there significant difference in the assessment of respondents on the energy consumption?
5.Is there significant relationship in the assessment of respondents between the energy savings and consumption?
6.Based on the results of the study what program for energy conservation can be proposed?

Research Hypotheses

1.There is no significant difference in the assessment of respondents on the energy savings in terms of the space heating, cooling, ventilation, steam production, equipment usage, lighting, cooking, and domestic hot water
2.There is no significant difference in the assessment of respondents on the energy consumption in terms of Implement Energy-Efficient HVAC Systems, Adopt Renewable Energy Sources, Enhance Building Insulation and Design, and Deploy Smart Energy Management Systems.
3.There is no significant relationship in the assessment of respondents between the energy savings and consumption.

Significant of the Study
The results of this study would be of great significance and beneficial to the following stakeholders:
Officials and policymakers The results of this study can be used in setting policies that affect the energy conservation on the operations of hospital in China.
Hospital this would be a big help in the energy savings and reduce consumption
Researchers. This study provides researchers with new knowledge on the regulatory energy Savings and to reduce Consumption in selected hospitals in China.
Future researchers. Future researchers can use it as an academic reference in the research and development related to energy savings and reduce consumption of hospitals in China, and conduct similar research.

Scope and Delimitation of the Study
This study assessed the policy on Energy Savings and Reduce Consumption in China Medical University Stomatology Hospital, Shenyang, China with the end view of a proposed program for energy conservation. The respondents will assess the energy consumption in the hospitals in terms of the terms of Implement Energy-Efficient HVAC Systems, Adopt Renewable Energy Sources, Enhance Building Insulation and Design, and Deploy Smart Energy Management Systems. Likewise, energy conservation in terms of the Implement Energy-Efficient HVAC Systems, Adopt Renewable Energy Sources, Enhance Building Insulation and Design, and Deploy Smart Energy

Description of the Study Area:
Research Design
This study utilized the descriptive-comparative research design. Descriptive comparative is where the " researcher considers two variables (not manipulated) and establishes a formal procedure to compare and conclude that one is better than the other" (Aunión-Villa et al, 2021[3]). The comparison on this study is between different groups of respondents. They will assess the energy consumption in the hospitals in terms of the terms of Implement Energy-Efficient HVAC Systems, Adopt Renewable Energy Sources, Enhance Building Insulation and Design, and Deploy Smart Energy Management Systems. Likewise, energy conservation in terms of the Implement Energy-Efficient HVAC Systems, Adopt Renewable Energy Sources, Enhance Building Insulation and Design, and Deploy Smart Energy.
The research locale. This study was conducted at China Medical University Stomatology Hospital, Shenyang, China.
Population, Sample and Sampling Technique
The researcher used "purposive sampling" which "is a non-probability sample that is selected based on characteristics of a population and the objective of the study" (Rrossman, 2017[4]). The researcher is purposively looking for the hospital employees in the said hospital.
The selection criteria of respondents are as follows:
1.Only regular employees
2.The respondents are already in their respective work assignment for at least one (1) year.
3.The respondents are those who have knowledge about the energy consumption and energy conservation in the hospital.
Population is defined as the totality of the individual with one or more characteristics in common that are of interest to the researcher. Thus, the population is the group to which the researcher would like to make inferences. To accomplish this study, the researcher will be utilized the "purposive sampling" from the population. A subset of a statistical population in which each member of the subset has an equal probability of being chosen. A "purposive sampling" sample will be utilized in this study in which all the identified respondents from Shenyang, China.
Data Gathering Procedure
The researcher was first requested permission from different Chief of offices of selected hospitals which is the subject of this study. To gather data through the online and offline survey (whichever is more convenient to the respondents). The survey was consumed not more than 15 minutes of the respondents' time and was administered during their non-official

work hours. The survey will be administered offline or online, if online the researcher will make use of Google Forms since the researcher has access to G Suite for Education. During data gathering, respondents' information were held in the highest confidentiality and is accessible only to the researcher and the statistician.

Research Instrument

The research instrument used by this researcher was a self-made survey questionnaire personally made by this researcher with the assistance of his adviser. There are two (2) parts of this survey questionnaire. The first part is the assessment on the energy consumption and. Part 2 is on the assessment of the respondents on the energy conservation.

Statistical Treatment of Data

To interpret the assessment of the respondents on the energy consumption in the hospitals in terms of the terms of Implement Energy-Efficient HVAC Systems, Adopt Renewable Energy Sources, Enhance Building Insulation and Design, and Deploy Smart Energy Management Systems. Likewise, energy conservation in terms of the Implement Energy-Efficient HVAC Systems, Adopt Renewable Energy Sources, Enhance Building Insulation and Design, and Deploy Smart Energy. (Maria Psillaki, et al 2023[5]). The Questionnaire's four-point Likert scale is described as follows: 4-Strongly Agree (SA); 3-Agree (A); 2- Disagree (DA); and 1- Strongly Disagree (SDA).

Table 1 Profile of Respondents

Variable	Category	Frequency	Percentage
Sex	Male	182	72.8%
	Female	68	27.2%
Years in Service	1-5	32	12.8%
	6-10	98	39.2%
	11-15	61	24.4%
	16 above	59	23.6%

The profile of respondents in this study reveals several notable trends concerning sex and years of service. The sample comprises a higher proportion of male respondents, accounting for 72.8% (182 individuals), while female respondents represent a smaller share at 27.2% (68 individuals). This imbalance suggests a gender disparity within the surveyed population, which may reflect broader patterns within the industry or organization studied. Additionally, the distribution of respondents by years of service indicates a substantial number with considerable experience. Those with 6-10 years of service form the largest group, comprising 39.2% (98 individuals) of the sample. Following this, a notable proportion of respondents have 11-15 years of experience, accounting for 24.4% (61 individuals), and another 23.6% (59 individuals) have been in service for over 16 years. Meanwhile, respondents with the least experience, specifically 1-5 years, form the smallest group at 12.8% (32 individuals).

This distribution implies a workforce with a solid foundation of professional experience, as a significant majority (87.2%) have been in their roles for over five years. Such experience could contribute to a more seasoned perspective on organizational issues or industry practices. The smaller representation of newer employees might suggest limited recent hiring or potentially high retention rates, depending on the context. The overall composition of respondents suggests that insights gained from this sample are likely to reflect the perspectives of experienced male employees more prominently, which should be considered when interpreting broader implications of the findings.

Table 2 Assessment of Respondents on the Energy Savings in Terms of Space Heating

Indicator	Weighted Mean	Standard Deviation	Qualitative Description	Verbal Interpretation
Replacing outdated heating systems with energy-efficient models, such as condensing boilers and heat pumps, to reduce energy consumption for space heating	2.68	.823	Agree	Evident
Implementing zonal heating controls allows hospitals to heat specific areas as needed, reducing energy waste in unoccupied or less critical spaces	2.55	.840	Agree	Evident
Using programmable thermostats and advanced climate control systems helps maintain optimal temperatures while minimizing energy use during off-peak hours or in unoccupied areas	3.25	.636	Agree	Evident
Incorporating heat recovery ventilation systems in hospitals can significantly reduce heating demands by capturing and reusing heat from exhaust air	2.78	.866	Agree	Evident
Enhancing the insulation of hospital buildings, including walls, roofs, and windows, reduces heat loss and lowers the energy required for space heating	2.83	.948	Agree	Evident
Sealing gaps and cracks in the building envelope prevents heat loss, improving the overall energy efficiency of hospital heating systems	2.84	.942	Agree	Evident
Hospitals are increasingly adopting radiant heating systems, which	3.28	.652	Agree	Evident

provide efficient and uniform heating, reducing energy consumption compared to traditional forced-air systems.				
Installing solar thermal systems to provide supplemental heating can reduce the reliance on conventional energy sources and lower heating costs	2.80	.841	Agree	Evident
Using geothermal heating systems, which leverage the earth's stable temperatures to provide efficient and sustainable space heating	3.21	.765	Agree	Evident
Conducting regular energy audits helps hospitals identify inefficiencies in their heating systems and implement targeted improvements to conserve energy	2.65	.829	Agree	Evident
Overall Mean	2.886	.3372	Agree	Evident

Legend: 3.51 – 4.00 (Strongly Agree-Highly Evident); 2.51 – 3.50 (Agree- Evident); 1.51 – 2.50 (Disagree-Slightly Evident); 1.0-1.50 (Strongly Disagree-Not Evident)

The assessment of respondents regarding energy savings in hospitals, specifically for space heating, highlights a consistent perception of various measures as "evident" in their effectiveness, with an overall mean of 2.886 and a standard deviation of 0.3372. This indicates general agreement among respondents that the listed interventions contribute to energy savings, though none were rated as "highly evident."

In summary, the results reveal that all interventions are considered "evident" in their contribution to energy savings, with technologically advanced solutions like radiant heating systems and programmable thermostats receiving the highest ratings. Structural improvements and system upgrades are also valued but are perceived as slightly less impactful. These findings underscore the importance of integrating advanced technologies with infrastructure improvements to achieve optimal energy efficiency in hospital space heating systems.

Table 3 Assessment of Respondents on the Energy Savings in Terms of Cooling

Indicator	Weighted Mean	Standard Deviation	Qualitative Description	Verbal Interpretation
Adopting energy-efficient cooling systems, such as variable refrigerant flow (VRF) systems and high-efficiency chillers, to reduce energy consumption for space cooling	2.67	.943	Agree	Evident
Implementing advanced HVAC controls, including smart thermostats and automated systems, helps optimize cooling based on real-time occupancy and external temperature conditions	2.71	.930	Agree	Evident
Hospitals are employing strategies to reduce cooling loads, such as shading devices, reflective coatings on windows, and cool roofs, to minimize heat gain and lower cooling demands	2.96	.699	Agree	Evident
Improving building insulation and sealing air leaks helps maintain cooler indoor temperatures and reduces the need for extensive mechanical cooling	3.14	.785	Agree	Evident
Utilizing natural ventilation during cooler periods or at night can reduce the reliance on mechanical cooling systems, contributing to energy conservation	3.05	.932	Agree	Evident
implementing chilled beam systems, which use water to cool spaces more efficiently than traditional air-based systems	2.93	.845	Agree	Evident
Integrating heat recovery systems in HVAC designs allows hospitals to capture and reuse waste heat from cooling processes, improving overall energy efficiency	2.98	.850	Agree	Evident
Installing **Variable Speed Drives (VSDs)** on cooling equipment, such as fans and pumps, enables the systems to operate at variable speeds, matching cooling output to the actual demand and saving energy	2.99	.850	Agree	Evident
Comprehensive energy management systems (EMS) allow hospitals to monitor and control cooling systems more effectively, ensuring optimal performance and energy use	2.96	.778	Agree	Evident
Designing hospital buildings to minimize direct sun exposure and optimize natural shading can significantly reduce cooling needs	3.08	.787	Agree	Evident
Overall Mean	2.948	.3345	Agree	Evident

Legend: 3.51 – 4.00 (Strongly Agree-Highly Evident); 2.51 – 3.50 (Agree- Evident); 1.51 – 2.50 (Disagree-Slightly Evident); 1.0-1.50 (Strongly Disagree-Not Evident)

The assessment of respondents on energy-saving measures for hospital cooling reveals a consistent perception that each intervention contributes meaningfully to energy conservation, with an overall mean score of 2.948 and a low standard deviation of 0.3345. These findings indicate that respondents generally "agree" on the effectiveness of each listed measure in reducing cooling energy demands, categorizing all interventions as "evident" in their energy-saving potential.

Overall, the findings indicate a balanced perception of various energy-saving strategies, with a preference for interventions that either leverage natural environmental conditions, such as insulation and natural ventilation, or employ advanced controls and design features to reduce cooling demands. Respondents appear to agree on the "evident" impact of each intervention, though certain strategies—particularly structural and design-based measures—are rated slightly higher, reflecting their perceived effectiveness in achieving sustainable cooling solutions in healthcare facilities.

Results and Discussion

Summary of Findings

1.Profile of Respondents: The profile analysis of respondents revealed a predominance of male participants, who accounted for 72.8% of the sample, compared to 27.2% females. The respondents represented various tenure groups, with a notable concentration in the 6-10 years category (39.2%), indicating a generally experienced cohort. This composition suggests that the responses primarily reflect the perspectives of long-term employees, who may have substantial familiarity with energy consumption practices and potential efficiency measures within hospital settings.

2.Assessment of Respondents on Energy Savings Measures: Respondents showed consistent support for a range of energy-saving measures, with all categories rated as "evident" in their potential to reduce hospital energy consumption. Key areas of support included enhanced building insulation and smart energy management systems. Respondents particularly valued design and structural improvements — such as high-performance insulation, reflective roofing, and passive solar designs—which optimize heating and cooling efficiency. Additionally, smart energy management systems received high ratings for their ability to monitor and control energy use dynamically, enabling targeted strategies in critical areas like operating rooms. Renewable energy adoption and energy-efficient HVAC systems were also viewed positively, reflecting respondents' recognition of the need to incorporate sustainable practices and efficient technologies within healthcare facilities.

3.Differences in Respondents' Assessment of Energy Savings Based on Sex and Length of Service: Analysis by sex showed significant differences in perceptions in some areas, with females rating the effectiveness of energy-efficient HVAC systems, renewable energy, and overall energy-saving measures slightly higher than males. Conversely, differences by length of service were minimal, with only the assessment of smart energy management systems showing a significant difference. Mid-tenure respondents (11-15 years) rated these systems highest, possibly due to their operational experience with both traditional and newer technologies. These findings suggest that while most energy-saving practices are viewed similarly across demographic groups, mid-career professionals and female respondents may be particularly aware of or optimistic about the benefits of advanced energy-saving technologies.

4.Assessment of Respondents on Energy Consumption Practices: The assessment of energy consumption practices underscored the significance of HVAC systems, which were recognized as a major contributor to hospital energy use, often accounting for over 50% of total consumption. Respondents supported the adoption of energy-efficient HVAC systems and renewable energy sources to reduce energy demand and operational costs. Building design enhancements and insulation were also valued for their role in lowering energy requirements for heating and cooling. Respondents highlighted the importance of using renewable energy and smart EMS to manage consumption effectively, reflecting a balanced view that combines structural, technological, and sustainable approaches to energy management in hospitals.

5.Differences in Respondents' Assessment of Energy Consumption by Sex and Length of Service: There were significant differences by sex in assessments of energy-efficient HVAC systems, renewable energy adoption, and overall energy consumption practices, with females generally rating these measures more favorably. Length of service, however, showed only one significant difference: respondents with 1-5 years and 11-15 years of service rated smart EMS more positively than those with longer tenure, suggesting that mid-career professionals might be more familiar with or optimistic about newer technologies. In general, these findings indicate that while perceptions of energy consumption practices are consistent across service lengths, there is a slight variance based on sex, with females showing a slightly higher receptivity to energy-saving measures.

Correlation Between Energy Savings and Consumption Practices: Correlation analysis identified several significant relationships between energy-saving and consumption practices. Notably, enhanced building insulation and smart EMS were significantly associated with space heating, indicating that respondents see these measures as beneficial for controlling temperature and reducing heating needs. Additionally, renewable energy adoption was positively correlated with equipment usage, lighting and cooking, and domestic hot water consumption, reflecting a perception that renewables can effectively offset energy demands across various hospital operations. Overall, the significant positive correlation between general energy savings and consumption assessments suggests that respondents who value energy-saving measures tend to believe these practices effectively reduce overall energy consumption in hospitals.

CONCLUSION

1.The respondent profile primarily reflects the views of a male-dominated and experienced workforce, with most participants having long tenures. This demographic likely provides an informed perspective on hospital energy management practices, shaped by substantial familiarity with facility operations.

2.Respondents consistently endorse energy-saving strategies, especially structural improvements like advanced insulation and smart energy management systems. These measures are valued for their potential to enhance energy efficiency in critical hospital areas, including HVAC systems and patient care spaces, demonstrating a strong commitment to sustainable practices.

3.Female respondents tend to rate energy-efficient HVAC systems, renewable energy, and overall energy-saving practices more favorably. Differences by tenure are minimal, with mid-career respondents showing the strongest support for smart energy management systems, possibly reflecting their balance of experience with familiarity with newer technologies.
4.HVAC systems are widely recognized as a significant contributor to hospital energy use, often accounting for a large portion of total consumption. Respondents advocate for energy-efficient HVAC systems and renewable energy sources, underscoring a preference for a comprehensive approach that integrates sustainable practices with advanced technology.
5.While there is general agreement on energy-saving and consumption practices across tenure groups, female respondents show slightly higher enthusiasm for these measures. This suggests that while all respondents view energy-saving practices positively, demographic factors such as sex can subtly influence receptivity to specific measures.
Significant correlations reveal that respondents see energy-saving measures — especially enhanced insulation, smart energy management systems, and renewable energy—as effective in reducing hospital energy consumption. This strong association indicates confidence in a multifaceted approach to energy management, incorporating structural, technological, and sustainable solutions to optimize efficiency in healthcare settings.

REFERENCES

[1]. Alotaiby, Rana & Krenyacz, Eva. (2023). Energy efficiency in healthcare institutions. Society and Economy. 45. 10.1556/204.2023.00013.
[2]. International Energy Agency, Energy Efficiency in China (February 12, 2021).
[3]. Energy efficiency in healthcare institutions (Rana Alotaiby & Eva Krenyacz, 2023)
[4]. Aunión-Villa, J. – Gómez-Chaparro, M. – García-Sanz-Calcedo, J. (2021): Study of the Energy Intensity by Built Areas in a Medium–Sized Spanish Hospital.
[5]. Rossman. G.B., Rallis, S.F. (2017). An introduction to qualitative research: Learning in the field: (4th ed.). Los Angeles, CA: Sage.
[6]. Maria Psillaki, et al (2023) Hospitals' Energy Efficiency in the Perspective of Saving Resources and Providing Quality Services through Technological Options: A Systematic Literature Review.