RESEARCH ARTICLE

Coping with coal: Exploring the experience of communities near a coal-fired power plant utilizing descriptive phenomenological approach

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ABSTRACT

Background: Coal is the largest source of energy on earth and is used to supply electricity in many countries. Unfortunately, as much as it helps light up some communities, coal-fired power plants are also the world's biggest industrial polluters.

Objectives: This study investigated the environment and health conditions of the community before, and 20 years after the construction of the coal. It explored the perception of the respondents on the presence of a coal-fired power plant in their community, and determined strategies that can help protect the community against the coal-fired power plant.

Methodology: It utilized descriptive phenomenological design using in-depth interviews through snowball sampling. Data were analysed through Colaizzi method and was guided by the health belief model which claims that change can occur if self-efficacy is built in.

Results: Three themes emerged from the analysis: (1) realization of the deterioration of the environment and the residents' health, (2) awareness on the interplay between economic gain, politics, and impact on health and environment, and (3) recognizing the need for increased community empowerment on health and environment.

Conclusion: The presence of a coal-fired power plant in the community brings about negative changes in health and environment. Sustainable efforts to combat such negative effects are needed, and community residents in the vicinity of the power plant need to be empowered to conduct check-and-balance for their own health and environmental safety.

Keywords: *coal-fired power plant, health, environmental pollutants, community empowerment, phenomenological study, Colaizzi method*

Introduction

Coal-fired power plants remain a leading world source of energy mainly because it is cheap and is readily available. In 2018, coal's contribution to global energy was at 27%, making up to 38% of total electricity generation [1]. In 2020, global coal production has increased by 1.5%; this, despite the decline in consumption by 0.06% [2]. In the Philippines, coal continues to provide more than a third of the installed capacity of power plants which accounts for 35.3% [3]. In the Quezon province, the existing power plant in the town of Pagbilao is two units of 367.5 MW each, and together, they produce approximately six billion kWh of electricity per year. The electricity generated by the two units is fed to the Luzon grid through a 230kV transmission line [4]. In 2019, it was reported that the Philippines utilized 49% of its electricity production as powered by coal, followed by gas, 19%, and other fossils, 12% [5].

However, the truth remains: coal is the most polluting source of energy which emits twice as much carbon dioxide as natural gas [6] thus bringing negative health and environmental effects among those living within its vicinity. Globally, 800,000 people die prematurely each year due to the direct or indirect effects of air pollution, and millions suffer from illnesses due to many harmful pollutants it emits

[7]. In the Philippines, it is estimated that 2,400 Filipinos are dying from coal-related air pollution every year and at least 12% of workers employed in coal-fired power plants have contracted lung diseases suspected due to inhalation of dust during mining operations [8]. Further, a recent study showed that there is a strong association between increase reliance on coal and the incidence of lung cancer [9], and that communities living near the mines are more prone to reduced life expectancies and increased rates of lung cancer, heart, and kidney disease [10]. For the environment, the effect of a coal-fired power plant is equally grim. Sixty-five percent of global emissions are from carbon dioxide, mostly released by burning fossil fuels [11]. This, in turn, contributes to the trapping of greenhouse gases into the atmosphere resulting in global warming [12]. Aside from the greenhouse effect, a coal-fired power plant is also the largest single source of mercury emissions which affects aquatic life and contaminates fish due to neurotoxin [13].

It was noted that despite the decline in the use of coal, specifically in the west where policies are in place, it remains the single source of power generation in Asia [14]. In the Philippines, despite the recent call by the President for urgent action to the climate crisis, it was reported that there is still a need for a more aggressive move to transfer to renewable energy [15]. While the government tries to align its policies to the Paris Agreement on Climate Change with regards to coal utilization as an energy source [15], there is also a need to look into the experiences of people living in the vicinity of a coal-fired power plant, to hear their stories and understand their experiences as to the effects of the power plant in their individual and community lives, more specifically with regards to health and environment. The purpose of this study is three-fold: first, to investigate the environmental and health conditions of the community before the construction of the coal. Secondly, it aims to explore the perception of the respondents on the presence of a coal-fired power plant in their community, and finally, to determine the strategies that can help protect the community against the health and environmental impacts of the coal-fired power plant.

Methodology

This study utilized a descriptive (transcendental) phenomenological research design. It is an approach that focuses on describing the common lived experiences of a particular group [16] which in this case, the community residents within the vicinity of the coal-fired power plant in Pagbilao, Quezon, Philippines. Anchored in the Health Belief Model as a theoretical framework which posits that optimal behavior change can be achieved if messages are designed to target the respondents' perception on the severity and threat of the condition, weighing in of the benefits and barriers of change and most importantly, enhancement of self-efficacy to move towards behavior change [17]. The ontological assumption in this study attempts to bring into reality the respondents' experience on how it is to live within the vicinity of the coal-fired power plant thus, gaining fresh perspectives especially in terms of their health and environment.

In terms of epistemological assumption, since the interpretative analysis of the researcher is of utmost importance in the descriptive phenomenology [18], it was equally important to separate the researchers from the phenomenon under study, and to have a non-judgmental stance, which, according to Welch and Barr (2017), is called “bracketing” [19]. Since the researchers do belong to the medical field (a registered nurse, a registered medical technologist, a public health expert, and a medical doctor), the researchers thought it was easy to be removed from bias and reflexivity. However, as the interview progressed and the respondents were describing the experiences, the researchers were unconsciously getting into the moment, and must constantly be reminded to stay focused as to the goal of the study. The researchers were also aware that the relationships they developed with the respondents may also create bias during the interview hence, they had to continuously "step back" to capture the rawness of the data.

Context

The setting of the study is in Pagbilao, Quezon. It is a first-class municipality located around 160 kilometers south of the Philippine capital, Manila with a population of 75,023 [20]. It houses one of the largest power plants in the Philippines called “Pagbilao Power Station (PPS).” The PPS is located in a scenic island called Isla Grande in Pagbilao, around one hour by car from the town proper. The power station is located within the vicinity of a community (Barangay Polo, Pagbilao), producing a maximum of 16,800 MWh of daily electricity [21]. The setting was chosen, among other existing powerplants in the country, for two reasons: (1) the powerplant is situated in the same region as the researchers, (2) there is a plan to construct another powerplant in another town which is not too far from Pagbilao.

Sampling strategy

Snowball sampling was used in choosing the respondents. First, a meeting was conducted through a point person from

someone in the community whom the researchers know. After explaining the purpose of the research as well as the criteria for choosing the respondents, he then introduced three prospective participants who in turn, introduced two others, and so on. Respondents were chosen based on the following inclusion criteria: (1) they must have lived as an adult (above 18 years old) prior to the construction of the coal-fired power plant in 1994; (2) they must have lived continuously in the community from birth until the time the research was conducted; and (3) must willingly consent to the in-depth and recorded interview. The reason for the second criteria is because the duration of their exposure will provide a better perception in elucidating information. To determine the saturation, the recorded interviews were continuously examined, and the researchers returned to the community until there was enough information from the respondents and no added information was obtained. Data collection was deemed completed once saturation was reached, yielding a total of 10 interviews. The research study was conducted in full conformance with the Ethical Review Board (ERB) of the Adventist University of the Philippines, the principles of the Declaration of Helsinki, good clinical practice, and the laws and regulations of the Philippines. The identities of the participants were kept confidential and only the study team had access to the interview data. The audio recordings were deleted upon completion of the analysis.

Data collection methods

The data gathering was conducted from November 19 until December 20, 2019 in the respondents' homes. To determine the individual perception of the respondents, a one-on-one in-depth interview was used, guided by an instrument created by the researchers. The main purpose and objectives of the study were thoroughly explained, and the respondents were reassured that they have an option to leave the interview room and not answer the questions should it make them uncomfortable. The confidentiality of data collection was also emphasized. Two researchers (one asking the question and the other doing audio-recording and taking down nonverbal cues) conducted sequential interviews through a guided questionnaire. There were three rounds of questions, each question lasting about 15 minutes. The researchers utilized their own phones for audio recording, after asking for the respondent's consent. As the study progressed, and as data saturation was closing in, adjustment on the data collection process was done. Due to the very common themes coming out from the responses, the researchers then decided to conduct a focus group discussion (FGD) among the respondents to inform them about the analysis and to verify the result. Since the respondents are familiar with each other, the FGD was held in three different residential homes, as per the respondents' choice where they live close by. One group consisted of four respondents, while the other two groups consisted of three, respectively. Utilizing a guided questionnaire, two researchers conducted the FGD in sequence, with one asking the question while the other conducts recording. There were three rounds of questions, with each lasting for 30 minutes.

Units of the study

There are 10 respondents in the study: two males and eight females. Most of the respondents are between the ages of 53 to 75 years old. Of these, four are married, four widows, one widower, and one separated. All respondents are living less than one kilometer from where the powerplant is located.

Table 1. *Characteristics of the respondents*

	Age	Sex	Marital status	Occupation	Distance from the powerplant
1	53	Male	Widowed	Fisherman	600 meters
2	64	Female	Widowed	None	1 kilometer
3	65	Female	Married	Housewife	700 meters
4	75	Female	Widowed	Retired	600 meters
5	52	Female	Married	Community Health Worker	700 meters
6	54	Female	Widowed	None	900 meters
7	56	Male	Married	Councilor	1 kilometer
8	55	Female	Separated	Store Owner	900 meters
9	58	Female	Married	Community Health Worker	1 kilometer
10	57	Female	Widowed	Housewife	900 meters

Data processing

From the audio-generated data, it was transcribed in a Word document by two co-researchers. The verbatim statements were in Filipino and were translated into English by the lead researcher for presentation in this paper. The verbatim transcript was validated by the lead researcher and the respondents. Data were coded according to the research questions posed by the study, ensuring that data integrity and anonymity were upheld throughout the process.

Table 2. *Contextualizing the Colaizzi approach in data analysis*

Steps	Action/Analysis
Familiarisation	The verbatim transcript of the interview was read and re-read many times. Lead and co-researchers went back and forth with the verbatim transcript and the audio recording for confirmation.
Identifying significant statements	Significant themes were identified. We were careful in giving accurate interpretation and moving back-and-forth with the respondents' statements until we are satisfied with the formulated meanings.
Formulating meanings	Meanings were attached to the significant statements related to the phenomenon, careful to conduct "bracketing" or phenome-nological reduction (putting judgment).
Clustering themes	Themes were organized based on the meanings. Confluence or merging descriptions were clustered into themes. A review of theme consistency was done by the lead researcher and co-researchers.
Developing an exhaustive description	As themes evolve, researchers wrote a description of the phenomenon, incorporating the themes that were produced.
Producing the fundamental structure	The written manuscript was reviewed and further condensed, this time with support from existing literature.
Seeking verification of the fundamental structure	Data was echoed back to the participants through FGD.

Data analysis

To elicit an exhaustive description of the phenomenon in regard to the paradigm and aim of this research, the data was analyzed through the Colaizzi method. There are seven steps in this method [22]. Table 2 presents how this approach was contextualized in the study.

Quality assurance

To enhance the trustworthiness and credibility of the data, the lead researcher and co-researchers conducted counter-checking of the audio and transcripts and audit trails to ensure that interpretation of the emerging themes is attested and details are not missed. Further, triangulation was done through literature review, observation on the participants during the interview, a walk-through in the community as well as examining the epidemiological data found in the Community Health Center and Rural Health Unit, respectively.

Results

The researchers were guided by the aims of the study in extracting meanings and interpretations in the data generated from the respondents. The Colaizzi method was methodically employed in identifying significant statements, formulating meanings, clustering themes as well as developing exhaustive descriptions regarding the theme. Table 3 reflects the significant statements, source, and formulated meanings.

Table 3. *Significant statements, source, and formulated meanings*

Significant statements	Source	Formulated meanings
I was here before the plant started…. this was a **very nice community**, the **sea breeze was cool**…the **climate was not that hot** and there was no dust, now the **environment is hotter** and **dusty- from the coal ash**, especially when the southwest wind comes here, there is also a **stench**.	p.1 Line 5-14	There is a change in the environment (in terms of abundance of dust from the ash coal, a hotter environment, and presence of stench)
When the power plant came, we noticed that the **fishes were dying**…. In those days, we get our main food from the sea…but now, we were told not to catch fish in the **sea as it has become contaminated**.	p. 1 Line 38-41	The main source of livelihood of the people was affected as the sea becomes contaminated.
There are **so many widows** in our community. Many are **dying of cancer and heart disease**… This place used to be **quiet** and **not many illnesses**, now, many are having **asthma, allergies, cancer, heart disease**…	p. 3 Line 93-97	There is an increasing number of people getting sick and dying.
In the community, the barangay **regularly receives the Real Property Tax**, the barangay gets a share, 25%...our **roads are better** and the **mobility** of the residents going to the town center, has **improved**. **Our men were also given jobs in the plant**.	p.4 Line 165-166 p. 5 Line 217-219	The respondent realizes that there are monetary gains and improvements in the community infrastructure.
The community tax would have been great **if the incumbent program had been good** if there was a specific direction on how to spend the money.	p. 4 Line 167-170	The benefit for the community is poli-tically-driven. The people depend on what the leadersgive them.
I am not fully against the plant, but our **rights to health and a clean environment** must also be protected. **If we continue to experience the negative impact, my family is thinking of relocating to another place, far from here.**	p. 2 Line 54-60	Therespondentweighs on the benefit vs health and environmental impact of coal and community involvement.
There were programs especially in the beginning like checkups, environmental programs…but it is **not regular**. They do it once a year, I don't think it is enough… the **community must be involved**…to **speak up and look out for each other's welfare.**	p. 7 Line 280-282; 286-287	There is a desire for more regular health and environmental programs.
The community must have a **full representation**, especially in **checking the quality of air, water, of the sea,** and our health.	p.7 Line 318-320	Respondent realizes that an empowered leadership from the community is needed

Table 4. *Formulated meanings, theme clusters, and emerging themes*

Formulated meanings	Theme clusters	Emerging themes
There is a change in the environment in terms of abundance of dust from the ash coal a hotter environment and stench.	Awareness of the negative changes in the environment	1. Realization of the deterioration of the environment and the residents' health.
The main source of livelihood of the people was affected as the sea becomes contaminated.	Consciousness about the declining source of livelihood	
The respondent realizes that there is an increasing number of people getting sick and dying.	Awareness of the increasing number of people who are dying and getting sick	
The respondent realizes that there are monetary gains and improvements in the community infrastructure.	Indicates awareness of financial gain and improved infrastructure	2. Weighing in on the interplay between economic gain, politics, and impact on health and environment
The benefit for the community is politically-driven. The people depend on what the leaders give them.	Conscious about the presence of political interplay	
The respondent weighs on the benefit vs health and environmental impact of coal and community involvement.	Awareness of a lack of community involvement	3.Recognizing the need for increased community empowerment on health and environmental protection.
There is a desire for more regular health and environmental programs.	Conscious about the irregularity of health and environmental programs.	
Respondent realizes that an empowered leadership from the community is needed.	Awareness of the lack of empowered community leaders	

As the data was further analyzed and interpreted, the formulated meanings were clustered into themes until finally, three emerging themes came out from the analysis as reflected in Table 4.

More than 20 years of living within the vicinity of the coal-fired power plant has created impact to the environment and health of the residents, and not necessarily for the good, as reflected in the result of this study. Result showed that there was a deterioration, both in the health of the residents and the environment where they live. It was shown in the experiences that the environment has become *dusty from the ash coal*, that *there is a stench in the air*, and the community became *hotter than before*. Respondents reported that the source of livelihood was affected as there are *fewer fish due to contamination in the sea*, and they realized that there is an *increasing number of people getting sick and are dying*. Despite this, the *health and environmental programs are irregular* and there is *no one looking out for each other's welfare*. The respondents realized that living within the vicinity of the coal-fired power plant has its negative health and environmental consequences and that over time, the health and environment of the residents in the community have deteriorated. Phrases like "hotter environment", "dusty", and "presence of stench" were common throughout the interview. Similarly, these were also noted during our walk-through in the community. The respondents were reflective when asked to compare the community environment from the past, as they shared it was "beautiful, peaceful, cool breeze, and freedom to swim and catch fish in the sea."

Aside from the deteriorating environment, respondents were also aware of the health issues being faced by the community residents as they shared their experiences. Phrases like "our men are dying", "there are many widows…", "more illnesses experienced by everyone…" were common verbal reflections during the interview. The respondents mentioned diseases such as respiratory diseases, asthma, allergies, heart disease and cancer. As the epidemiologic data from the rural health unit (RHU) were further examined, the researchers noted that there was a link between the reported cases in the RHU and as to what the respondents were verbalizing concerning the causes of morbidity and mortality in the community, such as upper respiratory infections, asthma, and skin allergies; while the number one cause of death is cardiovascular disease.

Result of this study also showed that the respondents were aware of the benefits that they get from the coal-fired power plant; such that it created jobs to some and provided them with good roads and amenities. However, they were reflective of the health and environmental costs they have to pay as a community. The respondents feel that there are also benefits as the *community income has increased* and

the *roads are better now*, and some were *given jobs in the powerplant*. However, there is also an awareness that the benefits they get are driven by who is in political power, and that there is a desire for more *concrete and regular programs* and empowered leadership from the community. They feel that if they continue to experience the negative consequences, they may need to *look for an alternative place of stay, away from the power plant*. There is a desire for upholding and imposing their right to health and clean environment. The respondents appeared to be weighing in on the economic benefits of the powerplant, its impact on the health and environment, and the political scenario in the community.

Lastly, result of the study showed that the respondents are recognizing the need for a more empowered community; to have a voice, especially for the protection of their health and environment. However, as they realized this, they are also aware that this cannot be done if they are not well-represented and therefore, an empowered community leadership is needed. They feel that the community "must be involved…", "to speak up and look out for each other's welfare". They were also specific in what they want which are regular health and environmental programs as well as regular checking of the air, water, and sea quality. Further, they mentioned that "the community must have a full representation" especially in the activities concerning health and environmental protection.

Discussion

Three emerging themes were extracted based on the experiences of the respondents: (1) realization of the deterioration of the environment and the residents' health, (2) weighing in on the interplay between economic gain, politics, and impact on health and environment, and (3) recognizing the need for increased community empowerment on health and environment.

Deterioration of the environment and health

One of the themes elucidated from the respondents was the realization of the deterioration in the environment and the residents' health. This main theme was derived from the theme clusters such as awareness of the negative changes in the environment and awareness of the increasing number of people who are dying and getting sick. The burning of coal and the disposal of its residues results to waste materials that are harmful to humans, animals, and the ecosystem [23]. The various gases produced by coal combustion, such as sulfur dioxide (SO_2), nitrogen oxide (NO*x*), carbon dioxide (CO), hydrocarbons, and other elements such as mercury, arsenic, cadmium, etc., are released into the atmosphere, causing air pollution, sea animal poisoning, compromised water systems in the community thus resulting to disease and death [24]. Having said this, there is a need to strictly apply environmental safety protocol, both at the local and national levels, to train the organization and the public to minimize the environmental and health impact brought about by the presence of coal powerplant [23].

Data has shown that residents living within the vicinity of coal-fired power plants are most vulnerable to the burdens of negative health conditions [25]. It was shown that the effects of exposure to particulate matters (sulfur dioxide, nitrogen oxide), causes injury to the airways and lungs which leads to toxicity and inflammation, and eventual cell deaths [26]. Moreover, when heavy metals emitted from the plant are inhaled by humans and animals, fatal diseases like cancers may develop because heavy metals are indestructible [23]. Respiratory symptoms such as asthma, chronic obstructive pulmonary disease (COPD), and lung cancer are common conditions seen among residents in communities exposed to particulate matter [27]. Unfortunately, negative health effect was not limited to adults as the study revealed a significant adverse effect on children's neurodevelopment and respiratory morbidity [28]. Further, it was noted that there was a decreased life expectancy among communities who are exposed to coal [29].

Literature is teeming with pieces of evidence that there is indeed a negative impact on health and environment in communities where a coal-fired power plant is present. For this reason, a call to transfer to renewable energy has been highly recommended, albeit requires new technology and innovation [30]. Unfortunately, because it requires more investment of capital to shift to new technology and innovations, such idea has been largely ignored in the international debates, let alone in a small rural community such as the setting of this study.

Weighing in on the interplay between economic gain, politics, and impact on health and environment

The second theme that emerged was that there was a weighing in on the interplay between economic gain, politics, and impact on health and environment. This theme was elucidated from theme clusters such as the respondents' awareness of financial gain and improved infrastructure as well as their consciousness about the presence of political interplay.

It was reported that most of the communities living within the vicinity of coal-fired power plants tend to verge on a lower income group [31]. Initially, residents may feel an uplifting of their socio-economic status as more amenities are offered to them, especially at the beginning of the plant operation. However, continuous living close to a coal-fired power plant always results in negative health and environmental consequences [31]. This, therefore, comes back to the question of economic benefits versus environmental and health costs, in which it was noted that there is sizable local health cost as compared to a meager local economic benefit of a coal-fired power plant in a community, and that it is best to construct it away from a more populous, urban cities [32]. In Vietnam, a report on the socio-environmental impact of coal-fired powerplant showed that such practice for electrical generation is far from sustainable and has a massive impact on the population, and transitioning to a low carbon society is recommended [33]. Yet, transitioning to renewable energy is not easy as the interplay between the political agenda, the media and the group of people in the community who benefit from the coal powerplant is complex thus making it hard to phase out the power plant due to fear of rising electrical prices, potential unemployment as well as lose of businesses [34].

The respondents realized the benefits which the plant provided for the community, especially at the beginning of the operation. However, as time progresses, there seems to be a lax on the part of the stakeholders to provide sustainable health and environment protective programs as reflected in the study. This, coupled with the ongoing dilemma where people become victims of the current political system, the people have no choice but to wait for what is provided to them by whoever is holding the seat of power. As the respondents weigh in on the threat of exposure brought about by continuous living within the vicinity of the power plant, people's perception on susceptibility to the condition, its threat and severity, are important factors to consider in making decisions, as magnified in the Health Belief Model [17]. It is then the role of the power plant management, together with the stakeholders, community leaders and public health personnel to provide transparency to the residents of the community to discuss safety issues in terms of health and environment.

Recognizing the need for increase community empowerment to protect health and the environment

The last emerging theme in the study was the respondents' realization on the need for increased community empowerment on health and environmental protection. It is formulated from two cluster themes such as conscious about the irregularity of health and environmental programs and awareness of the lack of empowered community leaders. In India, Community Social Responsibility (CSR) has become mandatory for all coal-related activities. The concept is geared toward the organization taking responsibility for the impact of the activities they do and their commitment to upholding the ethical standards of operation to raise the community's quality of life [35]. Part of the CSR initiative is building community development, where people come together to take action in safeguarding their health, environment, and well-being. This encompasses community empowerment which simply states, the process of enabling the community to increase control over their lives [36]. The modern coal combustion system should not result in the emission of a serious smoke pollution problem, provided it is well regulated [37]. For example, Hammonds and Spargo [38] recommend strategies to mitigate the impact of carbon dioxide emission such as changing the capturing and storage route of the carbon dioxide known as the Carbon Capture Storage (CCS) process. Its efficiency and low operation cost enable to decrease the negative impact while enhancing the energy capacity [38]. Further, the use of solvent-based carbon capture is a mature technology that can also mitigate the negative environmental impact provided the stakeholders are willing to invest in the design and modern operation [39]. Despite the availability of information in mitigating the environmental and health impact of the coal-fired power plant, the community residents are not aware of such and have not been empowered to question whether or not the powerplant management is conducting rightful practices in accordance with the ethical standards and maximizing the best practices as far as coal emissions are concerned. As such, they desire for an empowered community through open dialogue and the provision of regular health and environmental programs. The Health Belief Model posits that people must have the confidence to perform a behavior despite the barriers in front of them [17]. It was noted in this study that the community needs an intervention that will address the building of their self-efficacy to help them come out with a concrete plan to mitigate the negative effects of the power plant in their health and the environment.

The result of this study showed that the presence of a coal-fired power plant in the community brings about changes in health and environment, and for most of the time, not necessarily for the good. Respondents came to realize that there was a deterioration in their health and environment over the years. There is a need for a more sustainable efforts to combat such effects and that community residents in the vicinity of the power plant need to be empowered to conduct check-and-balance for their own health and environmental

safety. Since the researchers all belong in the medical field, they had the tendency to fully empathize with the respondents, and it was difficult to separate themselves from the issue at hand. For most of the times, during the interview and the data analysis, they had to remind themselves to use an even tone, to be objective and to detach themselves from bias, albeit the difficulty of doing so, but they managed to remind each other when one is being overwhelmed. The quality and trustworthiness of this study were of utmost importance to the researchers. However, while the study generated unique data culled from the first-hand perspectives of the respondents, somehow, the researchers continue to ask how much data is considered enough? There is always subjective interpretation by the researchers, even while trying to remain objective and detached from own reflexivity. Moreover, as health professionals, the researchers have their own preconceived ideas on the impact of a coal-fired power plant on the environment and health, and much as they were careful of avoiding bias and judgment during the data gathering and interpretation, one can never achieve pure bracketing. However, the researchers were careful in staying true to the methodology and tool of analysis that were utilized in this study.

Conclusion

The opposing forces in this issue are clear: on one hand, advancing energy efficiency is required to make the people's lives more comfortable, and to serve the growing needs of the country; but on the other hand, the lives of the people living within the vicinity of a coal-fired power plant are at risk. There is a need to safeguard their lives against these pollutants and measures must be set in place to reduce the exposure. It is then highly recommended that communities should educate themselves, to engage in organizing and advocacy efforts to enforce accountability and social responsibility in energy production. Further, they must be educated that they are free to voice out their opinions, to make informed, individual choices and can engage in advocacy for the development of stringent regulations and improved corporate social responsibility.

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