



AQoL2022Putrajaya

<https://www.amerabra.org>



06th ABRA International Conference on Quality of Life
Double Tree by Hilton Putrajaya Lakeside, Putrajaya, Malaysia, 21-22 Nov 2022

Integration of Ethics into Radiation Protection Practice through Islamic Personality Approach

Hairenanorashikin Sharip^{1,2*}, Siti Noorsuriani Ma'on¹, Mohd Zulkifli Abdullah¹, Asih Puji Utami³
* Corresponding Author

¹ Faculty of Business and Management, Universiti Teknologi MARA (UITM) Malaysia, ² Faculty of Health Sciences, Universiti Teknologi MARA (UITM) Malaysia, ³ Fakultas Ilmu Kesehatan, Universitas 'Aisyiyah Yogyakarta Indonesia

hairena@uitm.edu.my, sitinoor123@uitm.edu.my, m_zulkifli@uitm.edu.my, asihpujiutami@unisayogya.ac.id
Tel: +60332584484

Abstract

Established guidelines in radiation protection practice still could not guarantee compliance from radiographers' part. Since non-compliance is unethical, radiographers should be better versed in biomedical ethics principles. The objective of this paper is to review the integration of ethics into radiation protection practice through an integrated Islamic personality approach. The review involves literature related to the topic studied. Content analysis of reading materials is performed. Results found that integrating ethics in the radiation protection framework could be accomplished by combining the essence of culture and belief. Personalizing Islamic Personality in radiation protection practice could help uphold ethics in practice.

Keywords: Ethics; Radiation Protection Culture; Islamic Personality; Muslim radiographers

eISSN: 2398-4287 © 2022. The Authors. Published for AMER ABRA cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>). Peer-review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), ABRA (Association of Behavioural Researchers on Asians/Africans/Arabians) and cE-Bs (Centre for Environment-Behaviour Studies), Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, Malaysia.
DOI: <https://doi.org/10.21834/ebpj.v7i22.4163>

1.0 Introduction

X-ray is a type of electromagnetic radiation that can penetrate through most objects, including the human body. Medical x-rays are used to obtain images of internal body tissues and structures for a patient's diagnosis and treatment. Using x-ray beams in various imaging modalities such as general radiography, computed tomography (CT) scans, and mammography aids in detecting illness and disease. However, x-ray generates ionizing radiation, a sort of radiation that can cause damage to living things. One's lifetime exposure to this risk rises in proportion to the number of times they are exposed to it. Even though the possibility of getting cancer from radiation exposure is relatively low, the risk should not be neglected. Radiation protection and safety guidelines have been designed to assure the protection and safety of the staff, especially radiographers, patients, and their relatives, throughout the procedure, as well as to prevent the accidental or unintentional exposure of fertile and pregnant women to radiation. Using appropriate techniques, equipment, and shielding materials, radiation safety is enforced to protect both patients and healthcare personnel, including radiographers, from unnecessary radiation exposure (Sherer et al., 2021).

Since Wilhelm Conrad Roentgen discovered the X-ray, medical radiation has been employed extensively to diagnose and treat patients. International Commission on radiation protection (ICRP) introduced the principle of justification, optimization, and dose limit as

eISSN: 2398-4287 © 2022. The Authors. Published for AMER ABRA cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>). Peer-review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), ABRA (Association of Behavioural Researchers on Asians/Africans/Arabians) and cE-Bs (Centre for Environment-Behaviour Studies), Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, Malaysia.
DOI: <https://doi.org/10.21834/ebpj.v7i22.4163>

three essential elements of the radiation protection framework (Seeram & Brennan, 2016). Any radiological procedure conducted must be justified to reduce radiation exposure risk, and ionizing radiation exams must be optimized. Justification requires that the examination be medically necessary and beneficial. Imaging should be performed with dosages that are as low as reasonably achievable (ALARA), considering the diagnostic goal. By lowering the risk of potential exposure, the patient should achieve enough individual or societal benefit to offset the harm.

The concepts of dose constraint and reference level are used in conjunction with the optimization of protection to restrict individual doses. A level of dose amount, either as a dose constraint or a reference level, always needs to be defined. The initial intention would be not to exceed, or to remain at, these levels, and the ambition is to reduce all doses to levels that are as low as reasonably achievable, with economic and societal factors being taken into account. Radiographers must apply these principles of justification, optimization, and dose limitation when dealing with patients. To ensure the promotion, implementation, and monitoring of radiation protection measures are appropriately undertaken, The International Atomic Energy Agency (IAEA), in its International Conference on Radiation Protection in December 2012, had come out with a specific document known as "Bonn Call-for-Action" (World Health Organization, 2017). This document highlights initiatives that could enhance the practice of radiation protection, including strengthening the implementation of justification and optimization principles, enhancement of safety culture in healthcare, strengthening radiation protection education and training, reinforcing safety requirements, fostering radiation benefit-risk dialogues and promoting strategic research agenda for radiation protection in medicine

However, there was no way to ensure that practitioners would follow these ethical criteria, and they still stand as recommendations with few consequences for failing to follow best safety practices (Zainuddin, 2018). Despite the ongoing development of ethical norms and radiation protection frameworks, the issue of non-adherence remains important and warrants special attention. Various studies show that the knowledge and practice of radiation protection among radiographers still need improvement (Abuzaid, 2019; Lewis, 2021; Sharma, 2016). Non-adherence is unethical, and it is not considered an excellent medical practice because a good medical practice relies on upholding the principle of biomedical ethics (Beauchamp and Childress, 2013). The four principles of biomedical ethics outlined by Beauchamp and Childress which are beneficence, nonmaleficence, autonomy, and justice; have become the cornerstone of biomedical ethics in healthcare practice.

The non-adherence issue requires incorporation of ethics to enforce radiation protection practices. The most widely held belief is that culture is a crucial determinant of an individual's ethical ideology, influencing an individual's propensity to act ethically (Mustamil & Quaddus, 2009). To put it another way, culture serves as a guideline for determining whether certain practices are appropriate and acceptable. Religion is part of the culture and one of many ways of openly expressing and experiencing spirituality (Edara, 2017). In other words, cultural values are regarded as a basis for religiosity. Since non-compliance is unethical, radiographers should be better versed in biomedical ethics principles. The objective of this paper is to review the integration of ethics into radiation protection practice through an integrated Islamic personality approach through literature. This review will focus on the significance of integrating ethics into radiation protection practice in medical imaging through Islamic personality approach.

2.0 Methodology

This qualitative review involves conducting research, reading, analyzing, evaluating, and summarizing journals and articles specifically on integrating ethics into radiation protection through an Islamic personality approach. A literature review retrieves related information on the research topics (Chua, 2011) and it has three essential aspects which are introduction, content, and conclusion (Idris, 2013). First, the author defined the research question, which is why Islamic personality should be integrated with ethics in radiation protection practice. According to Synder (2019), a literature review may be the best methodological tool to provide answers for certain research questions. The literature search focuses on the practice in the medical imaging field and involves radiographers. The literature search was conducted via google Scholar databases. Then, the literature was synthesized and sorted based on selected themes: ethics, radiation protection practice, and Islamic personality. The literature was analyzed to gather relevant information. Finally, the review is elaborated according to the organized themes.

3.0 Result and Discussion

3.1 Ethics in Medical Imaging

Ethics, also known as moral philosophy, is the study of what is morally good and evil and what is ethically right and wrong. As a branch of medicine, the medical imaging field is expected to uphold the pillars of biomedical ethics, as good medical practice is based on keeping the values of this biomedical ethics (Beauchamp & Childress, 2013). Beneficence, nonmaleficence, autonomy, and justice are the pillars that provide standards in the professional relationship between radiographer and patient and guidelines for the prevention of litigation. The pillar of beneficence requires that the procedure be performed to benefit the patient. While all health care providers, including radiographers, should develop and maintain skills and knowledge, they should constantly update their training, consider the individual circumstances of all patients, and strive for net benefit. The pillar of nonmaleficence requires radiographers not to cause harm to a patient intentionally or to allow damage to be caused to a patient through neglect. The third pillar, autonomy, need patients to have thought, intention, and action autonomy when making decisions about any health care procedures. A patient must understand all risks and benefits of the procedure and the likelihood of success to make an informed decision. The fourth pillar, justice, requires that procedures uphold the spirit of existing laws and are fair to all parties involved to dismantle the effects of racism and maintain equity and fairness in treatment.

Although ethics is a crucial component of radiation protection, the various stakeholders and practitioners involved in medical imaging have rarely recognized this (World Health Organization, 2022). In fact, the four pillars of medical ethics values have yet to be widely known, understood, or applied in medical imaging practice (Bochud et al., 2020). According to Zolzer (2020), radiation protection in medical imaging was primarily regarded as a matter of science and possibly of practical experience as well, but not of ethics. This could be because ICRP publications need to better address the ethical foundation of the radiation protection system in medical imaging (Cho et al., 2018). In 2013, the International Commission on Radiological Protection (ICRP) established a task group (TG) on 'Ethics of Radiological Protection (ICRP TG94) to review the Commission's publications for any ethical issues that may be present (Clement & Lochard, 2017). According to the task group report, the framework of radiation protection is based on four core ethical values: (1) beneficence/nonmaleficence; (2) prudence (making informed and carefully considered choices without full knowledge of the scope and consequences of an action); (3) justice; and (4) dignity (the unconditional respect that every person deserves, regardless of personal attributes or circumstances) (Cho et al., 2018). These core ethical values, according to ICRP, support the three fundamental principles of justification, optimization, and individual dose limitation; and are consistent with the four pillars of biomedical ethics; with the added value of prudence.

While radiographers and medical imaging practitioners believe that adhering to the radiation protection framework is sufficient to ensure good ethical practice in medical imaging, this is not always the case, and the current framework does not address the numerous dilemmas that can arise (World Health Organization, 2022). Due to its limited legal standing, this framework and many established guidelines, so-called "ethical guidelines" related to it, could not guarantee adherence from radiographers (Zainuddin, 2018). While radiographers demonstrated a good understanding of the hazards associated with the diagnostic use of ionizing radiation and the mechanisms for protecting against such hazards, it had little impact on radiation protection practices, which were inadequate (Eze et al., 2013). Sharma et al. (2016) discovered a 'knowledge-practice gap' in using personal protective devices among radiographers, with only 22% of respondents using lead gloves on patients during the procedure. One of the reasons given by Lewis et al. (2021) for this is that radiographers chose not to comply because it took longer to complete the work if the protective shielding for the patients was used. While this practice is unethical and a medical-legal issue, some radiographers were unaware that they could be penalized for failing to meet appropriateness and optimization criteria during a radiological procedure (Paolicchi et al., 2015). This condition, which is also faced by the Muslim radiographer community due to a lack of radiation protection awareness (Alghani et al., 2018) and an inadequate level of radiation protection practice (Abuzaid et al., 2019), will expose patients and the general public to additional radiation doses.

Given that the components of the existing radiation protection framework and the ethics approach have similar themes and objectives, their effectiveness will be considerably improved if they are mapped and integrated together. According to the World Health Organization, ethics can be incorporated into the existing framework for radiation protection in medical imaging by introducing a fourth component, namely ethics in medical imaging. However, it is believed that this cultural shift would present difficulties for some health professionals, particularly radiologists and their organizations. Regarding the incorporation of ethics into the context of radiation safety, the International Radiation Protection Association (IRPA) established a relevant notion in the medical imaging in 2014. The radiation protection culture (RPC) combines science, value, ethics, and experience to promote radiation protection principles in a diagnostic imaging department (Coates & Le Guen, 2014). Due to the increasing use of ionizing radiation for diagnostic purposes, the rapid development of medical imaging modalities, and the high radiation doses supplied by interventional procedures, the implementation of RPC in medical imaging is crucial and necessary (Ploussi & Efstathopoulos, 2016). Directly resulting from using RPC is a significant reduction in radiation dose for both patients and employees. A robust RPC facilitates more effective diagnosis and treatment and reduces the negative consequences of ionizing radiation.

Although RPC is available in most medical imaging departments, it is challenging to enhance the existing culture due to poor understanding and a lack of collaboration among all stakeholders (Ploussi & Efstathopoulos, 2016). Since the construction of RPC requires three significant stages of development, namely essential compliance, self-directed safety compliance, and a behavioral safety system, it is essential to improve RPC from the basic compliance stage to the behavioral safety system (Coates & Le Guen, 2014). As a member of the radiation staff, diagnostic radiographers must actively participate in the department's RPC programs. In a department with solid RPC, diagnostic radiographers are responsible for their safety and the safety of others, such as their patients and coworkers, with the manager supporting the act of good responsibility (IRPA, 2014).

Since lack of collaboration is one of the significant challenges in establishing a solid RPC (Ploussi & Efstathopoulos, 2016); thus, integration of Islamic perspectives in the fundamental radiation safety principles is an effort to motivate Muslim radiographers to be more responsible concerning radiation protection programs (Ahmad Radzi, 2018). Furthermore, by realizing that the regulations are aligned with Islamic perspectives, it is hopeful that Muslim radiographers will cooperate fully in the RPC programs. This is because one of the behavioral elements of RPC is personal accountability (Coates & Le Guen, 2014). Therefore, personalizing Islamic Personality in radiation protection practice, as a part of radiation protection culture, could help uphold the principle of radiation protection in medical imaging practice and the principle of medical ethics.

3.2 Integration of Islamic Personality and Islamic Ethics in Radiation Protection Practice

Islamic personality is a psychological idea based on moral principles (Frager & Fadiman, 2005). It contains all of the moral principles and social graces outlined in the Holy Qur'an and Prophet Muhammad's (peace be upon him) Hadith (Tekke, Ismail, Adnan, and Othman, 2015). Islam does not limit its understanding of ethics to the religious morality expressed in certain rituals like prayer, fasting, and abstaining from alcohol. It addresses all facets of life, including those related to the body, morals, and religion, in a secular context, as well as those related to the mind, the heart, and society (Yaken, 2006). The Holy Qur'an and the Prophet's (peace be upon him) Hadith serve as the foundation for Islamic ethics, which are supplemented by ethical ideas and views formulated by legitimate Muslim scholars. Islamic tradition

translates the words "ethics" and "morality" as "khuluq" (character), from which the word "akhlaq" is derived (Shogar, 2015). The Arabic term akhlaq is derived from the khuluq root word.

According to Ibn Manzur and Al-Ghazali, akhlaq is a mirror of a person's inner essence that carries unique significance in light of their status as created creatures and manifests itself through their good or evil personalities and behavior (Mat, Basir, and Zanariah, 2015). Akhlaq can be viewed in the context of morality and virtue (Hashi, 2011). The Arabic word for knowledge of akhlaq, 'ilm al-akhlaq, is pluralized as 'ulum al-akhlag. It is a field of study that addresses how to uphold virtues at their highest degree by abstaining from wrongdoing and acting in a way that is morally and pleasant (Ahmat & Akdogan, 2012). In light of current thinking, the phrase "ilm al-akhlaq" is therefore regarded to be equivalent with the terms "ethics," "morality," and "values."

Thus, Islamic personality is viewed as an all-encompassing way of life, resulting in an approach that can connect every aspect of Muslim behavior, attitude, and emotion. The framework of Islamic personality is formed by the Islamic creed, which refers to a testification of the oneness of Allah as God and the Prophet Muhammad as the messenger of Allah. A strong foundation of Islamic personality will uphold Islamic ethics, which is to recognize right from wrong according to the teaching of the Al-Quran and As-Sunnah (behavior and lifestyle of the Prophet Muhammad). Thus, the personalization of Islamic personality is an effort to integrate ethics into radiation protection practice. A Muslim radiographer is obligated to follow the radiation protection guidelines as it is a good deed that will benefit others, especially patients. He or she should avoid wrongdoings, including non-adherence to radiation protection practice, as it will harm patients. Promoting good deeds and preventing wrongdoing aligns with Islamic teaching and the Islamic personality concept. In Islam, a good deed will be given a good reward by God, and performing bad deeds, and sinful actions will be punished. This concept is an alternative to integrating ethics in radiation protection practice.

Al-Ghazali asserts that self-purification (tazkiyatunnafs), which includes mujahadah al-nafs (fight against immoral and evil qualities) and riyadah al-nafs (controlling and teaching oneself to begin performing good deeds gradually), can lead to the creation of a decent personality (Sham et al., 2013). While mujahadah al-nafs concentrates on avoiding the characteristics and behaviors of mazmumah, riyadah al-nafs encourages good character traits and practices (vile). Together, these two ideas can support in reaching their full potential as Muslims. A good character of Islamic personality will fight against non-adherence practice in radiation protection as it is immoral while promoting good values and practices in dealing with patients while performing procedures. The good values should be recognized and addressed as they will inculcate a better culture of radiation protection practice.

In the context of Islamic bioethics, when dealing with ethical problems, Muslim jurists have taken recourse to the Maqāṣid al-Sharia, which is the purpose of the law. Anything that preserves one of these five purposes is regarded as beneficial, while anything that contributes to its detriment is immoral, and preventing it is deemed suitable. The five cardinal essentials of Maqāṣid Al-Shariah in Islamic teachings are the preservation of Faith (din), Preservation of Life (al-nafs), Preservation of Mind (al-aql), Preservation of Progeny (al-nasl), and Honor (al-irdh), and the last is Preservation of Property (al-mall) (Zainuddin, 2018). To preserve religion, radiographers must know that fulfilling obligations helps protect their faith / religious duties. While preserving life is not within the purview of radiographers, using radiation protection may help avoid future medical complications. In terms of mind preservation, applying adequate radiation protection practices may reduce the patient's confusion and anxiety (Zainuddin, 2018). In contrast, different attitudes toward radiation protection among practitioners may raise questions about the values or professionalism adopted by the individual professionals. The practitioner preserves his intellect by adhering to accepted practices. Furthermore, participation in radiation protection research can improve the use of intelligence. In terms of progeny preservation, this is addressed through special radiation protection considerations for women of childbearing age and children. Radiation is currently associated with harming fetuses and children. While in the preservation of property, if a medical condition is introduced due to non-compliance with radiation protection guidelines, the subsequent medical treatments can deplete the sufferer's financial resources.

4.0 Conclusion

Ethics is an essential element to be upheld in radiation protection practice, especially to overcome the issue of non-compliance. As Islamic personality is seen as a promising alternative to promote the culture of compliance, this scope of research could be expanded to identify better and recognize the relevant attributes of Islamic personality. Further study to evaluate the methods of ethics integration in radiation protection practice through an Islamic personality approach would benefit patients, radiographers, and the public. It would be helpful if any module or guidelines for Islamic personality application in radiation protection practice could be developed in the future. It also will help to facilitate the management of organizations and certified bodies to enhance the current standard of radiation protection practice. Above this, the right of the patient to have a safe method should be honored.

References

- Abuzaid, M. M., Elshami, W., Shawki, M., & Salama, D. (2019). Assessment of compliance to radiation safety and protection at the radiology department. *International Journal of Radiation Research*, 17(3), 439-446.
- Ahmad Radzi, H.S.B (2018). Integrating the Islamic perspectives in the fundamental safety principles to improve radiation protection culture among Muslim diagnostic radiographers. *International Journal of Allied Health Sciences*, 2(2), 339-346
- Ahmet, N., & Akdogan, C. (2012). Trust (Al-Amanah): A comparative study of its application in Islamic and Western science. In *The Asian Conference on Ethics Religion and Philosophy* (pp. 47-57).

- Algohani, K. A., Aldahhasi, A. A., Algami, A. H., Amrain, K. Y., & Marouf, M. A. (2018). Awareness of radiation protection measures among radiologists and non-radiologists. *The Egyptian Journal of Hospital Medicine*, 70(3), 371-375.
- Beauchamp, T. L., & Childress, J. F. (2013). *Principles of Biomedical Ethics*. 7. Aufl New York.
- Bochud F, Cantone MC, Applegate K, Coffey M, Damilakis J, Del Rosario Perez M et al., on behalf of ICRP (2020). Ethical aspects in the use of radiation in medicine: update from ICRP Task Group 109. *Ann ICRP*. 2020. 49(1_suppl):143–153. doi:10.1177/0146645320929630.
- Cho, K. W., Cantone, M. C., Kurihara-Saio, C., Le Guen, B., Martinez, N., Oughton, D., ... & Zölzer, F. (2018). ICRP publication 138: ethical foundations of the system of radiological protection. *Annals of the ICRP*, 47(1), 1-65.
- Chua, Y. P. (2011). *Kaedah penyelidikan* (Vol. 1). McGraw Hill (Malaysia) Sdn Bhd.
- Clement, C., & Lochard, J. (2017). Recent reflections on the ethical basis of the system of radiological protection. In *Ethics of Environmental Health* (pp. 76-86). Routledge.
- Coates, R., & Le Guen, B. (2014). Guiding principles for establishing a radiation protection culture. In *Invited Plenary Talk at the Fourth European IRPA Congress*.
- Edara, I. R. (2017). Religion: a subset of culture and an expression of spirituality. *Advances in Anthropology*, 7(04), 273.
- Fragar, R., & Fadiman, J. (2005). Transpersonal pioneers: Carl Jung. *Personality and personal growth*, 56.
- Hashi, A. A. (2011). Islamic ethics: An outline of its principles and scope. *Revelation and Science*, 1(03).
- Idris, N. (2013). *Penyelidikan dalam pendidikan*. McGraw-Hill Education.
- Lewis, S., Downing, C., & Hayre, C. M. (2022). Using the theory of planned behaviour to determine radiation protection among South African diagnostic radiographers: a cross-sectional survey. *Journal of Medical Radiation Sciences*, 69(1), 47-55.
- Mat, Z., Basir, S. A., & Zanariah, J. (2015). A study on practice of Islamic professional ethics in shaping an ethical work culture within Malaysian Civil Service Sector. *Asian Social Science*, 11(17), 28.
- Mustamil, N., & Quaddus, M. (2009). Cultural influence in the ethical decision making process: The perspective of Malaysian managers. *The Business Review, Cambridge*, 13(1), 171-176.
- Paolicchi, F., Miniati, F., Bastiani, L., Faggioni, L., Ciaramella, A., Creonti, I., ... & Caramella, D. (2016). Assessment of radiation protection awareness and knowledge about radiological examination doses among Italian radiographers. *Insights into imaging*, 7(2), 233-242.
- Ploussi, A., & Efstathopoulos, E. P. (2016). Importance of establishing radiation protection culture in radiology department. *World journal of radiology*, 8(2), 142.
- Seeram, E., & Brennan, P. C. (2016). *Radiation protection in diagnostic X-ray imaging*. Jones & Bartlett Publishers.
- Sham, F. M., Hamjah, S. H., & Mohd. Jurairi Sharifudin. (2013). *Personaliti dari perspektif al-Ghazali*. Penerbit Universiti Kebangsaan Malaysia.
- Sharma, M., Singh, A., Goel, S., & Satani, S. (2016). An evaluation of knowledge and practice towards radiation protection among radiographers of Agra city. *Sch J Appl Med Sci*, 4(6), 2207-10.
- Sherer, M. A. S., Visconti, P. J., Ritenour, E. R., & Haynes, K. W. (2021). *Radiation Protection in Medical Radiography-E-Book*. Elsevier Health Sciences.
- Shogar, I. A. A. (2015). *The basic structure of ethical norms*.
- Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of business research*, 104, 333-339.
- Tekke, M., Ismail, N. A. H., Adnan, M. A. M., & Othman, N. (2015). Students' Islamic personality on Amanah: A structural modelling approach. *Pertanika Journal of Social Science & Humanities*, 23(1), 129-138.
- World Health Organization. (2017). *Bonn call for action; 10 actions to improve Radiation Protection in Medicine in the next decade*. In *Radiologists Congress*.
- World Health Organization. (2022). *Ethics and medical radiological imaging: a policy brief for health-care providers*.
- Yaken. 2006. *What is the Meaning of My Belong to Islam?* Beirut: Darul Al-Ressalh Publication.
- Zainuddin, Z. I. (2018). 02| Personalizing Radiation Protection in Medical Imaging: An Islamic Approach. *Revelation and Science*, 8(1).
- Zölzer, F. (2020). Ethics of Radiological Protection—recent developments. *Journal of Public Health*, 42(1), 183-187.