Citation for Women in Science

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Women in Science

Historical accounts of the classic Islamic period and the premodern period celebrate numerous outstanding women who distinguished themselves in various fields of endeavor. Examples include ʿĀʾishah, the wife of the Prophet, who had a distinguished role in the transmission of the *ḥadīth*; Rābiʿah al-ʿAdawīyah, the renowned Ṣūfī (d. 801); Wallada bint al-Mustakfī who lived in the eleventh century in Córdoba and was a legendary literary figure of that period; and Shajar al-Durr who became the sultana of Egypt on 2 May 1250, marking the beginning of the Mamlūk era in Egyptian history. Historical records are practically silent when it comes to acknowledging Muslim women in science. A few recent studies have unearthed limited evidence on Muslim women in science such as Sutayta al-Mahamali who lived in Baghdad in the tenth century and was an expert in arithmetic and successoral calculations. Labona of Córdoba, who also lived in the tenth century, was an expert in solving complex geometric algebraic problems. Mariam al-ljliya of Aleppo was employed by the ruler of Aleppo, Sayf al-Dawla (944–967 CE), to use her handcrafted intricate and innovative design in making the astrolabes that were used to determine the position of the sun and the planets. Fāṭimah al-Majritiya was another astrolabe builder. She was the daughter of the famous Muslim astronomer Muḥammad al-Majritiya from

Andalusia who died in 1007 or 1008.

Muslim women in the classical period contributed to the advancement of medicine. This was due in part to the prevailing tradition among Muslim societies that women's health issues and related matters were handled by women. Islamic history records the names of many nurses including Rufayda al-Aslamiyyah, who is considered the first nurse in early Islam. She was trained by her father who was a physician. An Ottoman surgeon, Şerefeddin Sabuncuoğlu (1385–1468), who worked with many female surgeons of his time, gave detailed illustrations of obstetric and gynecological procedures performed by women on female patients in his textbook on surgery *Cerrahiyyetu'l-Haniyye*.

Muslim women who connected with high officials through their philanthropy work have played a major role in promoting science and medicine. They built schools, mosques, hospitals, and other public buildings. These women established *waqfiya* (endowments) to maintain these institutions. Fatima al-Fihri (d. 880) built the Qarawiyin Mosque in 859 in Fez, Morocco, which became an important center of learning. Students from many countries traveled there to pursue Islamic studies, astronomy, languages, and sciences. Dhayfa Khatun (d. 1242), the powerful wife of the Ayyūbid ruler of Aleppo, al-Zahir Ghāzī, was a prominent architectural patron. She funded numerous public buildings including two schools.

During the Seljuk period, 1071–1194, Gawhar Nassiba established a medical *madrasah* (school) and a hospital complex in 1071 in Anatolia. Turan Malik Hospital (Dar Al Shifa) was established in 1228. It was built by the wife of the ruler of the Divrigi area of Menguceks.

During the Ottoman period, Hurrem Sultan (d. 1558), the powerful wife of Süleyman the Magnificent, sponsored and established two schools and a hospital in the capital of the empire.

In the modern era, women's participation in science started to emerge in the Muslim world with the introduction of modern education in the mid-nineteenth century and continues to the present day. The study of science in school normally begins at an early age in elementary school and picks up later in high school. The twentieth century, particularly its later part, witnessed a tremendous expansion at both the high school and university levels. In the beginning of the twentieth century, for cultural, historical, and economic reasons, women's enrollment in the science section at high schools as well as at the university level lagged far behind men. Women accounted for less than 10 percent of enrollment. However, women's enrollment in science at both levels began to gain momentum. Today, women's enrollment has reached more than 30 percent in most Muslim countries and in several cases such as Iran and Turkey it has reached parity with

men or exceeded it.

Today, Muslim women are employed by governments, private organizations, and international agencies as teachers, professors, researchers, engineers, physicians, architects, administrators, and in many other positions. Muslim women are gaining ground in science employment everywhere and are making contributions on a large scale. Muslim women are active and influential members of various professional organizations related to their fields, participating in various capacities including publishing and professional meetings. Recently, they have started organizing at the local, regional, and international levels into various professional associations and networks with the help of local governments, international agencies such as the United Nations, and academic institutions in the United States, Europe, Asia, and Africa. Among these organizations are the Arab Network for Women in Science (2005) sponsored by the University of the Gulf countries in Bahrain; the Islamic Network for Woman in Sciences (established in July 2008); and the International Society of Muslim Women in Science (ISMWS), founded by Dr. Sultana N. Nahar in 2010 at Ohio State University. The purposes of these organizations and others are: (1) to promote access to careers in science and technology; (2) to build a database that will share information about research interests, work opportunities, training, and grants; (3) to organize conferences and/or workshops to increase their competency and skills to enable them to move up in hierarchy and to correct the current gender imbalance that is present to varying degrees in Muslim countries and in leadership positions; and (4) to establish awards recognizing Muslim women in science. For example, the ASTF (Arab Science and Technology Foundation) and Regional Bureau of UNESCO have partnered with L'Oreal to recognize five Arab women each year for their contributions in science.

While the representation of Muslim women in leadership positions related to science still lags behind that of men, an increasing number are assuming leadership in their fields, winning awards, earning patents, and making important contributions to the world's scientific knowledge. The world-famous architect Zaha Hadid, originally from Iraq, has received numerous awards for her distinguished work, including the Pritzker Architecture Prize award in 2004 (she was the first woman to receive this award in its twenty-six-year history) and the RIBA Stirling Prize award in 2010 and 2011. Another example is Farhonda Hassan, professor of geology from Egypt, who served as vice president of the Organization for Women in Science for the Developing World (OWSDW), formerly called the Third World Organization for Women in Science. The current executive board of this organization includes several Muslim women scientists.

Bibliography

Afkhami, Mahnaz. *Faith and Freedom: Women's Human Rights in the Muslim World*. Syracuse, N.Y.: Syracuse University Press, 1995.

Bachelet, Michelle. "*Women in Science and Technology in Muslim Countries*." *United Nations Entity for Gender Equality and the Empowerment of Women*. 20 September 2011. unwomen.org.

Beck, Lois, and Nikki Keddie, eds. *Women in the Muslim World*. Cambridge, Mass.: Harvard University Press, 1978.

Fernea, Elizabeth Warnock, and Basima Qattan Bezirgan, eds. *Middle Eastern Muslim Women Speak*. Austin: University of Texas Press, 1977.

Guessoum, Nidhal. "*Muslim Women Scientists Today*." *Irtiqa*. 2 May 2011. www.irtiqa-blog.com/2011/05/muslim-women-scientists-today.html.

Habbas, Corey E. "*Muslim Women in Science*." *Mission Islam*. www.missionislam.com/science/mwscience.htm.

Al-Hassani, Salim T. "*Women's Contribution to Classical Islamic Civilization: Science, Medicine, and Politics*." *Notes on Islam*. 24 April 2012. notesonislam.blogspot.com.

Keddie, Nikki. *Women in the Middle East: Past and the Present*. Princeton, N.J.: Princeton University Press, 2007.

"Muslim Women: Past and Present." *Wise Muslim Women*. www.wisemuslimwomen.org.

Nahar, Sultana N. "*International Society of Muslim Women in Science (ISMSW)*." ISMWS Charter. 2010. www.astronomy.ohio-state.edu/~nahar/ismws/ismwschrtr.pdf.

Waddy, C. *Women in Muslim History*. London: Longman, 1980.

Zaha Hadid Architecture and Design. *Design Museum*. 29 June 2007. designmuseum.org/design/zaha-hadid.