

ARAŞTIRMA MAKALESİ/RESEARCH ARTICLE

A Quest for why gemstones are used for healing

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Abstract

It is believed that healing power of gemstones increases to the sense of well-being. But it's unclear how it works. The aim of this study is to investigate the usage of the stones for therapeutic purposes by means of a survey. In this study, a face-to-face survey technique was employed to investigate personal reasons to use the gemstones for healing purposes. After 402 volunteers from various backgrounds were selected and asked them to answer 17 questions, the dataset was analyzed using IBM Statistical Package for the Social Sciences (SPSS). Results showed that women are most interested in gemstones, because they are used for jewellery. The most popular healing stones were Agate, Amethyst, Ruby, Amber and Quartz. Their eye-catching colours together with their healing power that are promoted in social media, strengthen the perception that natural stones can be used for healing or therapy. Healing stones also give spiritual serenity, which is the most important positive effect on people. Some reasons that push people to seek healing from natural stones included hoping of cure, seeking alternative medicine, knowing what specific stones are used as healing tools, searching ways to relieve stress and also protecting against evil spirits. It is stated that people's hope of cure strengthens the use of these stones as a healing tool.

Keywords: Gemstones, healing stones, face-to-face survey, participant

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1. INTRODUCTION

In the twentieth century, technology has reshaped our lives and individuals are paying more attention to their health than they ever have before. The situation was captured by Pilzer when he stated that “The next big thing is the wellness revolution” (Pilzer, 2007). Wellness can be defined as active monitoring of activities, choices and lifestyles that lead to a holistic state of health (GWI-1, 01.10.2021). However, wellness cannot be explained only by physical health. According to the World Health Organization, health is defined as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 01.10.2021). Therefore, the concept of wellness can also be explained as a sustainable physical, mental and social balance. In 2018, the global market share of the Wellness Sector, which is defined as healthy living, reached approximately \$4.5 trillion (GWI-2, 01.10.2021). In recent years, a new market based on natural stones has also been included in this commercial network. The global natural stones market is expected to reach \$443 billion in 2022 (GGJM, 01.10.2021). Since ancient times, natural stones, or healing tools, complement medical treatment, and have been used as an indicator of social status, which are shaped by purchasing power (Micke et al. 2010; Hatipoğlu et al. 2018; Calik et al. 2019). Also, these stones have been an important part of alternative medicine with different therapy applications for centuries (Ishaque et al. 2009; Seraj et al. 2011; Friedman, 2012; Atodaria et al. 2017; Arif and Hashim, 2021). In addition to being ornamental, gemstones are also used in different industries and in the production of high-tech products (Renfro et al. 2010). In recent years, due to the increase in purchasing power and demand, healing stones are also produced artificially and sold in the market at a much lower price than natural ones. However, this commercial area is supported by non-scientific studies and opportunistic people without scientific education. The healing stones market should be limited to benefiting the public so that people who are helplessly fighting diseases are not exploited materially and spiritually. However, the lack of scientific knowledge in this

field weakens the hand of competent people who are in the position of informing and warning the relevant authorities.

In its broad sense alternative medicine refers to “integrative,” or “complementary” medicine. But it also describes medical treatments that are used in the place of traditional (mainstream) therapies. One of the common alternative medicines is Therapeutic Touch, where, either a therapist who has healing power or a gem which is worn and touched to skin transmit their healing energy to person and repair anomalies in a person’s energy field and heals the person. It is believed that ‘healing touch’ increases the sense of well-being. But it’s unclear how it works.

The aim of this study was to investigate the usage of the natural stones for therapeutic purposes by means of a survey. We focused on especially how they were used by people and what their expectation was. This article examines the usage of gems as alternative medical treatments by means of a survey.

2. MATERIALS AND METHODS

2.1. Theoretical Framework

The term “natural stones” represents both semi-precious gems and rocks. The natural stones are the indicators of social status due to their appearance and rarity (Hatipoğlu et al. 2018; Calik et al. 2019). These stones have also been an important part of alternative medicine and used in the different therapy applications for centuries (Ishaque et al. 2009; Seraj et al. 2011; Friedman, 2012; Atodaria et al. 2017; Arif and Hashim, 2021). The stones have been widely employed to heal physical and emotional pain (Friedman, 2012; Atodaria et al. 2017; Arif and Hashim, 2021). Also, the natural stone users around the world believe that there are positive effects on health (Ishaque et al. 2009; Seraj et al. 2011). This survey supports our hypothesis, contrary to previous publications, which have merely stated authors’ opinions without any support.

2.2. Methods

All over the world, the current usage of the natural stones is almost as same as it was in the past.

This similarity can also be observed in cultural diversity. Therefore, the questionnaire method is an appropriate approach for investigating which the natural stones are used, how and why they are preferred for healing purposes. Also, our approach does not require the approval of any institution.

Using a questionnaire is one of the primary tools for gathering information in the social research area and is usually conducted to determine public trends. They can be used to compile various types of information.

Some of the survey types are face-to-face interviews, monitored surveys, mail surveys, telephone surveys, and internet surveys (Chadwick et al. 1984; Alreck and Settle, 2004; Neuman, 2005). The reliability and effectiveness of the findings in any study are closely related to the quality of the data. For this reason, before starting a survey study, the type of survey, statement types, sample size and reliability limits should be determined. In addition, during the data collection process, the scale should be designed to eliminate possible communication, perception and interpretation problems, and to prevent the forced participant (Cochran and Cox, 1992; Biemer et al. 2004). A sufficient number of trial surveys should be conducted in advance to assess whether there are any problematic factors between the interviewers and the subjects conducting the survey. The number of participants in trial surveys depends on the purpose and sensitivity of the researcher (Salant and Dillman, 1994; Fink, 2017). Coverage, sampling, measurement and response errors that may be encountered before, during and after the study should be minimized. Selecting the data collection method according to the purpose, being systematic and classifying it properly allows appropriate analysis of the findings (Kirk and Miller, 1986; Presser et al. 2004).

In this study, the face-to-face survey was selected, taking into account the features that are summarized above.

2.3. Field Works

Çanakale Onsekiz Mart University Earth Sciences and Natural History Museum

(ÇESM) was established in 2011 and has been receiving visitors regularly in the last decade. As a university museum, it is mostly visited by academic staff. In this survey, participants were selected among them.

N is the number of people in the target population, for a homogeneous group, p is the probability of occurrence of the event (0.8), q is the probability of non-occurrence of the event (0.2), t is a constant (1.96 for significance level $\alpha=0.05$), and d is the sampling error (0.05). For this study, the minimum number of subjects to be reached within the 95% confidence limits was calculated approximately according to these criteria (Cochran and Cox, 1992; Biemer et al. 2004). The minimum number of subjects within these reliability limits was calculated as approximately $n=234$. In this survey study, the 402 participants among the academic visitors and others were invited to the interview.

The scale was designed as a result of a large number of pretrial surveys. While preparing the scale, expert opinions from different branches were used. The scale consisted of 17 statements in total. Each section contained questions based on similar statements. And each expression is shown in the tables with the abbreviation "S" and sequence number.

The questionnaire included eight parts. The first part contained demographic statements (gender / age / education level / income rate / place you live the longest). The second part evaluated the level of interest in natural stones (do you think that some ornamental stones can heal / have you met people that wear natural stones to heal / are the healing methods that use stones harmful / how often do you wear natural stones or keep them in your living spaces). The third part assessed the healing power of natural stones (how effective are their therapeutic powers when treating issues / how effective do the colours of them reinforce the idea that the stones may be healing / how effective do well-presented stones bring about therapeutic purposes). The fourth part consisted of a multi-answers question about the most popular 90 auspicious or healing stones. The fifth part was a multi-answer question including 15 possible positive effects of healing

stones on people. The sixth part was also a multi-answer question including 17 question options on the origins of healing from natural stones. The seventh part was an open-ended question that identified which ailments natural stones can be good for. Finally, the eighth part was also an open-ended question and investigated how natural stones are used.

Field data were evaluated with the IBM Statistical Package for the Social Sciences (SPSS) program (Bryman, 2008). In data analysis with SPSS, standard deviation (std), mean, frequency and percent were used for each scale. The averages of the scales ranging from one-to-five were evaluated by considering the five-point Likert scale intervals recommended by (Pimentel, 2019). In binary scales such as Y/N, between 1.0-1.50 can be evaluated as "Yes" and between 1.51-2.0 as "Not".

3. RESULTS

This study was conducted in 2019 with 402 voluntary participants, 63.2% of whom were women and spent most of their life in the city. The participants age range was between 31-70, most were university graduated and their monthly income was around \$1000-\$2000. Results showed that 91.8% of the participants believed that some natural stones have a healing effect, 82.8% of them knew people who had been healed by these stones, and 95.5% of them assumed that expecting healing from natural stones is harmless. In addition, the participants stated that they have sometimes

various natural stones in their living spaces, i.e., office, home, etc. (Table 1).

It is also showed that natural stones are highly preferred for treatment purposes because of their eye-catching colours and also their promotion as a healing tool (Table 2).

Table 2. The power of healing stones.

	Frequency	Percent	Mean	Std.
S5. How effective are their therapeutic powers when treating issues?				
Very Low	6	1.5		
Low	28	7.0		
Medium	116	28.9		
High	184	45.8	3.70	0.88
Very High	68	16.9		
Total	402	100.0		
S6. How effective do the colors of them reinforce the idea that the stones may be healing?				
Very Low	22	6.2		
Low	60	16.7		
Medium	107	26.6		
High	158	37.3	3.41	1.09
Very High	55	13.2		
Total	402	100.0		
S7. How effective do well-presented stones bring about therapeutic purposes?				
Very Low	15	3.7		
Low	27	6.7		
Medium	125	31.1		
High	177	44.0	3.59	0.94
Very High	58	14.4		
Total	402	100.0		

Table 1. Interest level about healing stones

	Frequency	Percent	Mean	Std.
S1. Do you think that some ornamental stones can heal?				
Yes	369	91.8	1.08	0.28
Not	33	8.2		
Total	402	100.0		
S2. Have you met people that wear natural stones to heal?				
Yes	333	82.8	1.17	0.38
Not	69	17.2		
Total	402	100.0		
S3. Are the healing methods that use stones harmful?				
Yes	18	4.5		
Not	384	95.5	1.96	0.21
Total	402	100.0		
S4. How often do you wear natural stones or keep them in your living spaces?				
Never	64	15.9		
Rarely	100	24.9		
Sometimes	141	35.1	2.72	1.10
Most of the time	77	19.2		
Always	20	5.0		
Total	402	100.0		

According to the participants, the most popular natural stone among the ninety natural stones known as the "Auspicious Stone" or "Healing Stone" is Agate. Besides the natural stone, Amethyst is also very popular in the eyes of the participants. The gemstones followed and included: Ruby, Amber, Quartz, Moonstone, Turquoise, Emerald, Tiger Eye and Jade from highest to the lowest popularity. After that the list included: Coral, Oltu Stone, Sapphire, Pearl, Sedef Stone, Aquamarine and Opal all of which had lower rates of popularity. The others with less than 2% preference are not included in the Table 3.

Table 3. Auspicious or healing stones

S8. As far as you know or hear from your neighborhood, which of the following stones are popularly known as Auspicious Stones or Healing Stones?

	Frequency	Percent
Agate	245	8.4
Amethyst	232	8.0
Ruby	208	7.1
Amber	197	6.8
Quartz	174	6.0
Moonstone	136	4.7
Turquoise	129	4.4
Emerald	114	3.9
Tiger Eye	105	3.6
Jade	102	3.5
Coral	91	3.1
Oltu Stone	77	2.6
Sapphire	73	2.5
Pearl	69	2.4
Sedef Stone	68	2.3
Aquamarine	62	2.1
Opal	58	2.0
Others (<2%)	775	26.6
Total	2915	100.0

Table 4. Positive effects of Auspicious or Healing stones.

S9. As far as you know or hear from your neighborhood, which of the following can be positive effects of Auspicious or Healing stones on people?

	Frequency	Percent
Spiritual serenity	275	12.6
Protection against evil eye	234	10.7
Serenity	226	10.3
Health	199	9.1
Instant relaxation	174	8.0
Luck	149	6.8
Happiness	145	6.6
Optimism	143	6.5
Energy	126	5.8
Abundance	121	5.5
Self-confidence	111	5.1
Joy of life	96	4.4
Protection against evil spirits	85	3.9
Courage	78	3.6
Others	24	1.1
Total	2186	100.0

The most important positive effect of natural stones is their ability to elicit spiritual serenity. Other positive effects include protection against evil eye, serenity, health, instant relaxation, luck, happiness, optimism, energy, abundance, self-confidence, joy of life, protection against evil spirits and courage. The rest with less than 2% preference are excluded from the Table 4.

People also seek healing from natural stones for several reasons, but mostly for alternative medicine, hope of cure and providing healing. Other reasons people look to healing stones are because they are advised to them by close friends, they are in despair, they are influenced by the media, they are curious, they have special interests, they seek an easy solution, or they have a distrust of medicine, they have all belief systems, they are used to them to emulate others and they are impressed by the eye-catching colours of them. The reasons with less than 2% preference are not listed in the Table 5.

In this study, results also suggested that natural stones are known as healing tools and are mainly used for relieving stress, relieving negative energy and giving positive energy, relieving depression, helping anxiety, overcoming sleep disturbance and relieving pain. In addition, the stones are used for protecting against evil spirits, regulating the circulatory system, reducing fevers and alleviating teething pain for babies, relieving thyroid gland disorders, relieving

Table 5. Reasons for seeking healing from natural stones.

S10. Which of the following may be the reasons why people seek healing from stones?

	Frequency	Percent
Interest in alternative medicine	272	12.3
Hope of cure	270	12.2
Provide healing	219	9.9
Advice	215	9.7
Close friend's effects	183	8.3
Despair	178	8.1
Media influence	127	5.8
Wonder	118	5.4
Special interest	109	4.9
A distrust of medicine	109	4.9
Search for an easy solution	105	4.8
Religious beliefs	97	4.4
Wannabe	58	2.6
Eye-catching colours	44	2.0
Others (<2%)	103	4.7
Total	2207	100.0

respiratory system ailments, strengthening the immune system, providing radiation shielding and bringing luck, abundance and prosperity. Once again, the answers with less than 2% rate are not presented in the Table 6.

Finally, our questionnaire revealed that natural stones are often used as jewellery or personal accessories, carried on the body, in contact with skin and kept in living spaces.

4. DISCUSSION

Natural stones are an indicator of social status due to their colours, appearance and rarity (Harrell, 2012; Calik et al. 2019). In this study, one of the outcomes is that natural stones are mostly used for jewellery or personal accessories that are in contact with skin, or they are kept in living spaces. These stones are also used in alternative medicine for therapy purposes (Simmons, 2010). For example, significant effects of natural stone colours on feelings were observed whereby a majority of participants felt that precious and semi-precious stones get their “power” from their colours. Therefore, natural stones have been widely used for healing physical and emotional pain (Atodaria et al. 2017; Arif and Hashim, 2021). The current study also suggests that the stones are preferred for treatment at a high rate not only if they have eye-catching colours but also if they are presented as having healing abilities. However, the fact that natural stones are used for jewellery due to their eye-catching colours may explain the majority of the answers. All of the participants, mostly women, are interested in natural stones that are known

to have healing abilities. In addition, 91.8% of these participants thought that natural stones can be used as healing tools. Other studies have also shown that more females versus males tend to perceive the natural stones can help support a good life and sound health (Gayle, 2008; Saikia et al. 2016; Manandhar et al. 2018). According to the participants in the current study, the most popular natural stone, known as an “Auspicious Stone” or “Healing Stone”, is a Quartz derivative (Agate, Amethyst etc.). However, Amber is as popular as these natural stones among the participants. The findings presented here are supported by observations found in the world natural stone industry (Chase and Pawlik, 2002; Walter, 2009; Gienger, 2009). People who are interested in natural stones are aware of their uses and various effects. Similar to the current study, natural stone users around the world believe that there are positive effects on health (Ishaque et al. 2009; Seraj et al. 2011). For example, many users conduct non-religious spiritual practices, use gemstones or perform chakra rituals that contribute to both calming and healing (Friedman, 2012). In addition, as mentioned above, many worldwide users believe gemstones derive their influence from their colours, and therefore, they are widely used for healing physical and emotional pain (Micke et al. 2010; Leslie, 2016; Atodaria et al. 2017).

5. LIMITATIONS

Being a university museum, ÇESM is mostly visited by academic staff and students. The participants were mainly the visitors who were

Table 6. Healing stone benefits.

S11. What are healing stones good for?	Frequency	Percent
Relieves stress	166	18.3
Relieves negative energy and gives positive energy	97	10.7
Relieves depression, anxiety and sleep disturbance	89	9.8
Relieves pain	84	9.3
Protects against evil spirits and evil eye	62	6.8
Regulates the circulatory system	54	6.0
Reduces fever in babies and provides comfortable teething	50	5.5
Relieves thyroid gland disorders	49	5.4
Relieves respiratory system ailments	36	4.0
Strengthens the immune system	34	3.8
Provides radiation shielding	33	3.6
Brings luck, abundance and prosperity	20	2.2
Others (<2%)	132	14.6
Total	906	100.0

invited to fill-in this survey. The attendants to this study may not include all sociocultural communities interested in healing stones. In spite of this limitation, it is stated that the findings are in line with previous studies and healing stones have been used similar way from past to present all over the world.

6. CONCLUSIONS

The use of natural stones for jewellery and accessories is common. For this reason, women are most interested in natural stones. The idea that the natural stones can heal many sicknesses is strengthened by people's hope of cure, their eye-catching colours and their promotion as a healing tool. The most popular natural stones are Quartz, Agate, Amethyst and Amber. The most important positive effect of them is that they give spiritual serenity. The wellness-based interest in the stones originates from alternative medicine and hope of cure, whereby people hope to heal, relieve stress and protect against evil spirits.

Despite the positive benefits that natural stones may offer, it is very strongly suggested that the word "Healing", which is preferred in the promotion of gemstones, should not be used in marketing exercises, since it may interrupt conventional medical treatment processes.

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REFERENCES

- ALRECK, P.L. & SETTLE, R.B. (2004). *The Survey Research Handbook*. McGraw Hill, 3rd ed., ISBN: 978-0072945485.
- ARİF, E.M.M. & HASHİM, H.Z. (2021). Jewellery For Feel and Heal. *International Journal of INTI*. 25(1), 6-12.
- ATODARIA, E., GANDHI, K., RAOLE, V. & MASHRU, T. (2017). Healing Powers of Gem Therapy: An

Update. *EJPMR*. 4(8), 362-375.

BIEMER, P.P., GROVES, R.M., LYBERG, L.E., MATHIOWETZ, N.A. & SUDMAN, S. (2004). *Measurement Errors in Surveys*. New Jersey: John Willey & Sons, ISBN: 978-0-471-69280-5

BRYMAN, A. (2008). *Social Research Methods*. Oxford: Oxford University Press, 3rd ed., ISBN: 9780199202959.

CALIK, A., KARACA, O., YASAR, C. & ULUGERGERLI, E.U. (2019). Fake and Synthetic Minerals; A Way to Sustain the Gem Supply. In *Environmental Geotechnology*. 319-328.

CHADWICK, B.A., BAHR, H.M. & ALBRECHT, S.L. (1984). *Social Science Research Methods*. NJ: Prentice Hall, Englewood Cliffs, ISBN: 9780138183363.

CHASE, P. & PAWLIK, J. (2002). *Healing with Gemstones*. New Jersey: Career Press & New Page Books, ISBN: 978-8178088525.

COCHRAN, W.G. & COX, G.M. (1992). Cox GM. *Experimental Designs*. New York: Wiley, 2nd ed., ISBN: 978-0471545675.

FINK, A. (2017). *How to Conduct Surveys: A Step-By-Step Guide*. California: Sage Publications, 6th ed., ISBN: 978-1483378480.

FRIEDMAN, M. (2012). *Healing Spaces: Incorporating Gemstone and Chakra Healing into Architecture (MSc Thesis)*. University of Maryland: College Park's Library Collection.

GAYLE, L.C. (2008). Linking Women to Health and Wellness: Street Outreach Takes A Population Health Approach. *International Journal of Drug Policy*. 19(3), 205-210, doi: 10.1016/j.drugpo.2008.03.006.

GIENGER, M. & MAIER, W. (2009). *Healing Stones for the Vital Organs: 83 Crystals with Traditional Chinese Medicine*. Healing Arts Press, 1st ed., ISBN: 978-1594772757.

GGJM-Global Gems & Jewelry Market (2021). Report: Global Gems & Jewelry Market. <https://www.researchandmarkets.com/reports/4089890/global-gems-and-jewelry-market-by-type-by>, [Date Accessed: 01/10/2021].

GWI-1 Global Wellness Institute (2021). What is Wellness? <https://globalwellnessinstitute.org/what-is-wellness/>, [Date Accessed: 01/10/2021].

GWI-2 Global Wellness Institute (2021). Research: Statistics and Facts. Retrieved from. <https://globalwellnessinstitute.org/press-room/statistics-and-facts/>, [Date Accessed: 01/10/2021].

HARRELL, J. (2012). Gemstones. *UEE*. 1(1), 1-23.

HATIPOĞLU, M., KILIÇ, S., BABALIK, H., GÜNER,

- E. & GÜNEY, H. (2018). Healing-Therapy (Protective and Treatment) Effects on the Human Life of the Gemstones (Having Nodular and Crystalline Appearances); Some Samples Used in the Ancient and Medieval Times. *International Journal of Scientific and Technological Research*. 4(7), 10-37.
- ISHAQUE, S., SALEEM, T. & QIDWAI, W. (2009). Knowledge, Attitudes and Practices Regarding Gemstone Therapeutics in A Selected Adult Population in Pakistan. *BMC Complementary and Alternative Medicine*. 9(32), 1-17.
- KIRK, J. & MILLER, M.L. (1986). Reliability and Validity in Qualitative Research: Qualitative Research Methods Series. Newbury Park: Sage Publications, DOI: <https://dx.doi.org/10.4135/9781412985659>.
- LESLIE, J.F. (2016). Stone Medicine: A Chinese Medical Guide to Healing with Gems and Minerals. Healing Arts Press, 1th ed., ISBN: 978-1620555293.
- MANANDHAR, M., HAWKES, S., KENT, B., NOSRATI, E. AND MAGAR, V. (2018). Gender, Health and The 2030 Agenda for Sustainable Development. *Bulletin of the World Health Organization*. 96(9), 644-653, doi: 10.2471/BLT.18.211607.
- MICKE, O., SCHÖNEKAES, K., MÜCKE, R., KISTERS, K. & BÜNTZEL, J. (2010). Mystical Stones in Oncology: Crystal Healing Power or Perfect Nonsense? *Trace Elements and Electrolytes*. 27 (2), 73-79, doi: 10.5414/TEP27073.
- NEUMAN, W.L. (2005). *Social Research Methods: Qualitative and Quantitative Approaches*. Allyn & Bacon, 6th ed., ISBN: 9780205457939.
- PILZER, P.Z. (2007). *The New Wellness Revolution: How to Make a Fortune in the Next Trillion-dollar Industry*. NJ: Hoboken, John Wiley & Sons, 2nd ed., ISBN: 978-0470106181.
- PIMENTEL, J.L. (2019). Some Biases in Likert Scaling Usage and its Correction. *IJSBAR*. 45(1), 183-191.
- PRESSER, S., COUPER, M.P., LESSLER, J.T., MARTIN, E., MARTIN, J., ROTHGEB, J.M. & SINGER, E. (2004). Methods for Testing and Evaluating Survey Questions. *Public Opinion Quarterly*. 68(1), 109-130. <https://doi.org/10.1093/poq/nfh008>.
- RENFRO, N., KOIVULA, J.I., WANG, W. & ROSKIN, G. (2010). Synthetic Gem Materials in the 2000s: A Decade in Review. *Gems&Gemology*. 46(4), 260-273, doi:10.5741/GEMS.46.4.260.
- SAIKIA, N., MORADHVAJ & BORA, J.K (2016). Gender Difference in Health-Care Expenditure: Evidence from India Human Development Survey. *PLOS ONE*. 11(7), 1-15, <https://doi.org/10.1371/journal.pone.0158332>.
- SALANT, P. & DILLMAN, D.A. (1994). *How To Conduct Your Own Survey*. New York: Wiley, ISBN: 978-0-471-01273-3.
- SERAJ, S., E-KHUDHA, M., APORNA, S.A., KHAN, S.H., ISLAM, F., JAHAN, F.I., MOU, S.M., KHATUN, Z. & RAHMATULLAH, M. (2011). Use of Gemstones for Preventive and Curative Purposes: A Survey Among the Traditional Medicinal Practitioners of the Bede Community of Bangladesh. *American-Eurasian Journal of Sustainable Agriculture*. 5(2), 263-269.
- SIMMONS, R. (2010). *Stones of the New Consciousness: Healing, Awakening and Co-Creating with Crystals, Minerals and Gems*. US: North Atlantic Books, 1th ed., ISBN: 978-1556438110.
- WALTER, S. (2009). *Gemstones of the World*. London-New York: Sterling, 4th ed., ISBN: 978-1402768293.
- WHO-World Health Organization (2021). New Terms. Retrieved from. http://www.who.int/healthpromotion/about/HPR%20Glossary_New%20Terms.pdf, 2021, [Date Accessed: 01/10/2021].