Original Article

My Heart, My Art: A novel Nepali medical student art project and the link to learning

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Received: 06-MAR-2017 Accepted: 24-APR-2017 Published Online: 01-MAY-2017

Abstract

Background: Humanities programs in South Asian medical schools are slowly growing in popularity. Art-making opportunities within those programs, however, are limited despite their potential benefits including solidification and integration of learning. Aim: to examine art created by medical students for the breadth and depth of conceptual understanding that formed the foundation for its creation. Settings and design: Medical school in Nepal; qualitative study. Material and methods: First year medical students at the Patan Academy of Health Sciences in Nepal, in 2011, 2012, 2014 and 2016, were asked to volunteer and submit artistic interpretations of "cardiac science" during five weeks of learning about the cardiovascular system using any media. Submissions were digitally recorded. This art repository was used as the data set for the present study. Data analysis: curatorial analysis of a repository of art pieces using Rose's criteria for critical visual analysis. Results: Four main categories were generated: Anatomy Literal Representation, Artistic Representation, Tactile Renderings, and Linked to Health/Nepal. Conclusions: From literal to artistic/fanciful representation, student's art revealed a strong conceptual understanding of the cardiac science topic. A subset of tactile art highlighted the student's manual dexterity and propensity for kinesthetic learning. The links made by their art to socially relevant health issues, illustrated the student's ability to connect science to the needs of their patient population, and the important role for education in disease prevention. This is the first study that has explored art-making in the context of Nepali medical education and its potential role as an adjunct to science learning.

Keywords: Cardiac science; Curatorial analysis; Medical humanities; Medical student art

Cite this article as: Courneya CA, Cujec B, Joshi M, Dhital R. My Heart, My Art: A novel Nepali medical student art project and the link to learning. RHiME. 2017;4:31-41.

Introduction

Medical schools in South Asia have slowly begun to embrace programs in medical humanities including student exposure to literature, art, creative writing, drama, film, music, philosophy, ethical decision-making, anthropology and history.[1-3] Few medical schools in South Asia, however, have provided their students with opportunities for art-making (as opposed to art-exposure), despite studies that illustrate benefits including decreased stress, a better work-life balance, exploration of personal and professional identity, promotion of reflection and humanistic practice, and enhancement of interest in, and solidification of, learning.[4-8]

The founding leadership at Patan Academy of Health Sciences (PAHS) in Nepal were open, from the onset, to exposing their medical students to an annual art-making experience (called My Heart, My Art) that was embedded into a block of cardiac science learning. The result was the development of a multi-year repository of cardiac-inspired medical student art collected from 2011 to 2016. The aim of the present study was to perform a curatorial analysis of the medical student cardiac-art collection, in order to reveal the breadth and depth of conceptual understanding that formed the foundation for creation of this art. A curator is a content specialist whose role is to interpret a collection of material. The co-curators of this collection included a cardiologist, a cardiovascular physiologist, the founding director of the cardiac science block, and a public health doctor.

Material and Methods

Since 2011, first year medical students at the PAHS in Nepal were invited to submit artistic interpretations of the broad topic of "cardiac science" in conjunction with five weeks of learning about the cardiovascular system in their medical curriculum. The call for submissions was broad and no restrictions were placed on the media selected or the nature of their artistic interpretations (outside of the theme of "cardiac science"). Participation was voluntary and had no impact on their grades within the program. All submissions were digitally recorded and the images were cataloged according to year collected (2011, 2012, 2014 and 2016; the call for art was omitted in 2015). This art repository was used as the data set for the present study.

Ethics approval for use of secondary data was obtained through the PAHS Institutional Review Committee. Email consent was obtained from all students whose art was expected to be highlighted in the manuscript, and they were asked whether they would prefer to be identified or to remain anonymous. All chose to be identified as the creator of the artwork.

Data Analysis

Rose cites two criteria for a critical approach to visual methodology: taking images seriously by "close looking", and reflexivity of the individual researchers.[9] The methodology in the present study utilized Rose's criteria. Curatorial analysis of the collection began with close examination by the individual authors of each piece of art, and assignment of broad scientific descriptions (e.g. anatomy, physiology pathophysiology). Secondly, specific identifiers (e.g. literal, fanciful, metaphorical, humorous, linked to Nepal, linked to health, kinesthetic etc.) emerged organically. This process was repeated in an iterative fashion until each author developed an exhaustive list of identifiers. Discussions by the authors of the

descriptions and identifiers subsequently resulted in consensual generation of four main categories. Categorizations occurred across all media.

Results

A total of 86 students (44 men; 51.2%) submitted 92 individual pieces of art to the repository over the four years under study. On average, across all first-year classes (60 students per year) the submission rate was 35.4%.

The range of media of the submitted art included sculptures/installations (n=26; 28.3%), sketches/drawings (n=26; 28.3%), poetry/prose (n=11; 11.9%), photographs (n=10; 10.9%), collages (n=9; 9.7%), paintings (n=7; 7.6%), and videos (n=3; 3.3%).

With the aim being to reveal the breadth and depth of the student's understanding of cardiovascular science, the curators generated four main categories: Anatomy Literal Representation, Artistic Representation, Tactile Renderings, and Linked to Health/Nepal (Socially Accountable Art). These categories were not mutually exclusive; some pieces of art fit into more than one category.

Anatomy literal representation

The art characterized by this category, largely in the form of sketches (ink/pencil on paper), resembled textbook diagrams of cardiac anatomy, often including labels of the individual parts. These images exhibited a high degree of anatomical accuracy. An example of this type of submission is shown in Figure 1. The literalness of the images in this category was different from that of the submissions in any of the other categories, where artistic license was more liberal.

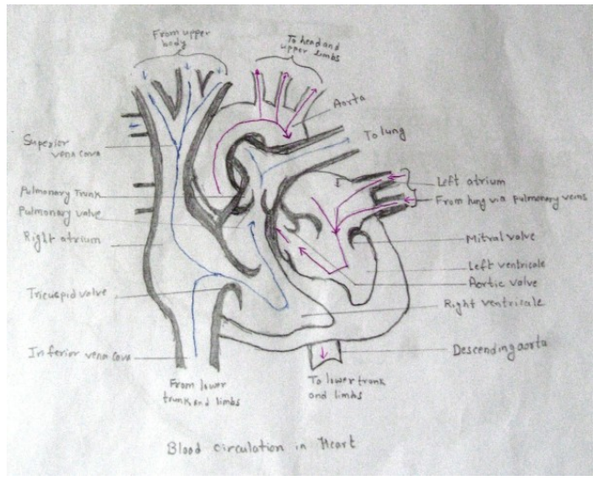

Figure 1: 'Untitled' by A. Mallik

Artistic Representation

In contrast, students whose art represented the second category gave full license to their artistic, creative and fanciful imaginations. They employed a range of media (sketches, sculptures, painting, collages). Often the cardiac image was secondary to a story or a larger artistic representation. There were images of the heart alone or incorporated into larger themes. S. Shrestha illustrated a heart whose arteries were transformed into tree branches and included a farmer in the ventricle tilling the soil that produced the tree (Figure 2).

Figure 2: 'My Heart, My Art' by Sweta Shrestha

In this category, S. Amatya sketched a heart made entirely of musical instruments thus highlighting the potential of the heart to create a "musical" rhythm (Figure 3).

Tactile Renderings

The art included in the third category illustrated the student's manual dexterity and hand-eye coordination. These two/three dimensional sculptures and installations were assembled with a variety of materials e.g. clay, straw, and Styrofoam. U. Paudel cleverly pieced together a mosaic of straw (Figure 4), to illustrate the shunts inherent to fetal heart and circulation. P. Subedi carved a cross section of the heart out of Styrofoam, illustrative of the angle of an ultrasound used in echocardiography (Figure 5). This was an example of a piece of art that could be used subsequently by the faculty in lectures/labs to help students visualize the heart cut into cross-sections.

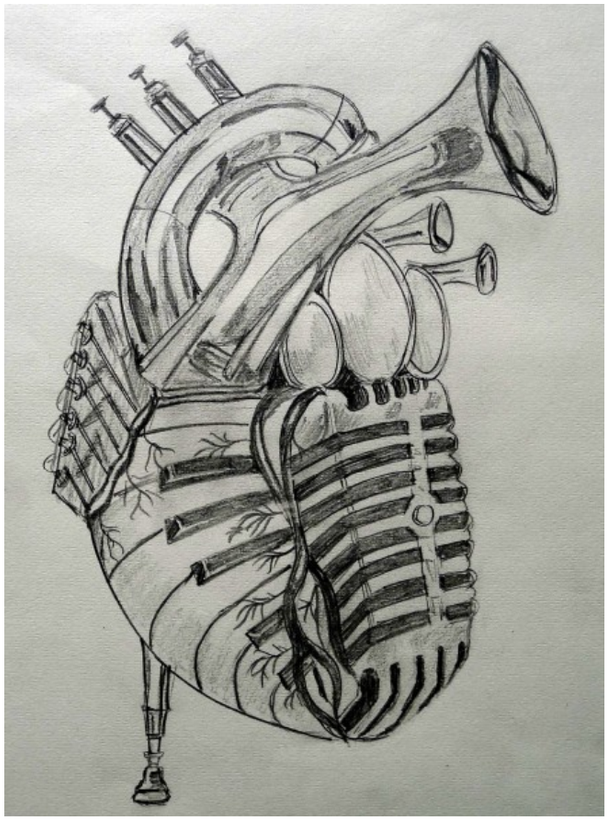

Figure 3: 'Heart Beats' by Suban Amatya

Figure 4: 'Fetal Circulation' by Ujawal Paudel

Figure 5: 'Untitled' by Prakiti Subedi

Art linked to Health/Nepal

The art in the fourth category included the student's artistic representation of factors related to health in general, to heart health in particular, and to specific heart-health concerns of Nepali people. A strong link to social accountability and preventative medicine was found in all these pieces.

"You reap what you sow", an installation by C. Shrestha (Figure 6), delineated the life style choices that can lead to ill health. This was poignantly illustrated by Shrestha using a dead tree branch, with cardboard organs as foliage and a variety of genetic and modifiable risk factors (e.g. male gender, cigarettes, alcohol, high fat diet) as the soil from which the macabre plant had risen.

Figure 6: 'You reap what you sow' by Carmina Shrestha

Many art pieces in this category singled out smoking as contributing to the development of heart disease in the people of Nepal. Figure 7 is a photograph of a village woman smoking a cigarette; taken by S. Basnet, it is coupled with an image of the heart (made with cigarettes), and portraying a plaque-filled descending thoracic aorta.

Figure 7: 'Smoking heart' by Sulab Basnet

N. Giri painted a man with a cigarette and wearing handcuffs, as if chained to his dependence on nicotine (Figure 8). The importance of health education in Nepal was elegantly illustrated (Figure 9) in a sketch showing young children in a rural setting being taught about the heart.

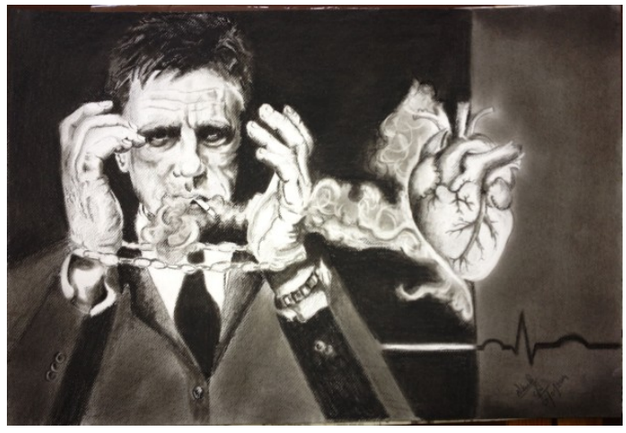

Figure 8: 'Untitled' by Nikesh Giri

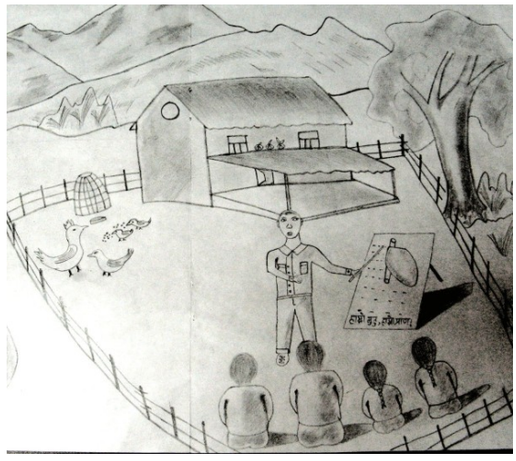

Figure 9: 'Untitled' by Laxman Sinali Thapa

Most laudable in the art within this category were the images by Nepali medical students who looked at improving the health of the Nepali people as having a role in making the country as a whole stronger. This was shown most clearly in Figure 10. In his painting entitled "Healthy System, Prosperous Country", Parajuli links the arterial and venous circulation of a healthy heart to the national flag and ultimately to iconic images of Nepal.

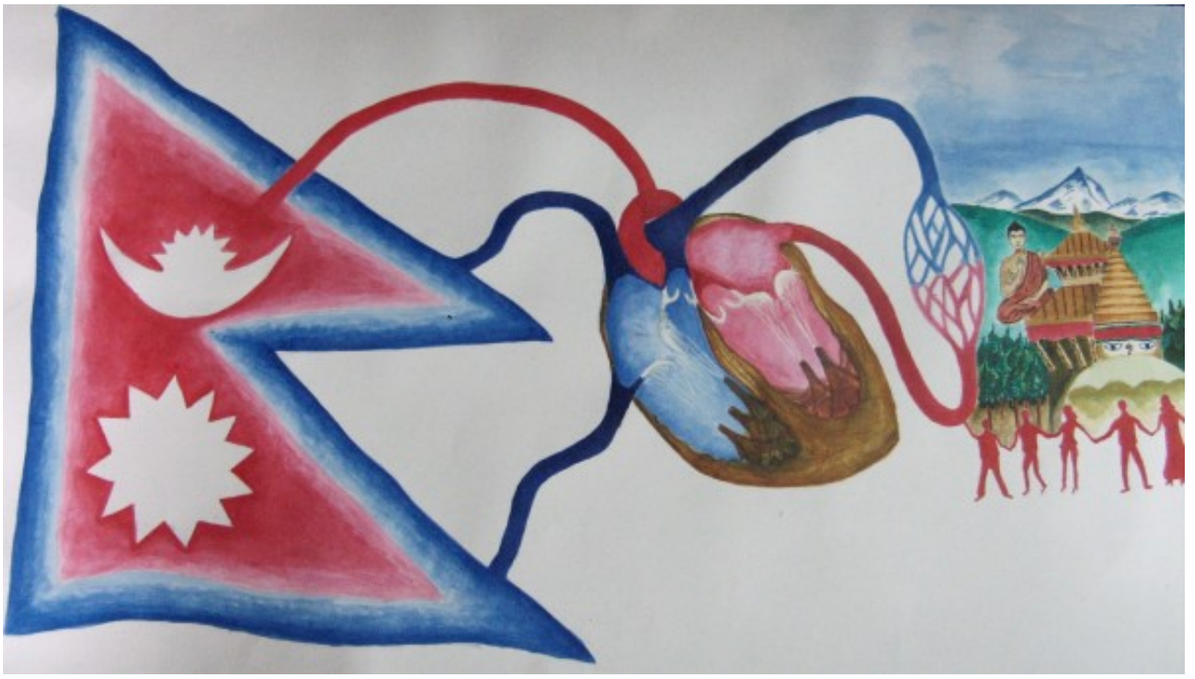

Figure 10: 'Healthy System, Prosperous Country' by Pravakar Parajuli

Discussion

In order to situate the art-making by medical students in Nepal we will briefly discuss medical humanities in other parts of the world. The field of medical humanities is well represented in medical programs in North America, Europe, and Australasia as outlined in reviews on this topic.[10-13] With regard to visual art, many of these humanities programs involve exposing medical students to works of art through visits to art museums or art classes by museum educators or art-historians.[14] The aim of these exposures is to enhance medical students observational/communication skills and empathy. Fewer humanities programs, however, focus on medical student art-making, as distinct from art-exposure. Drawing classes (with and without live models) have sparked medical student interest in anatomy, as well as provided opportunities for reflection and professional identity formation.[4,5,15]

Medical schools in South Asia, in contrast, have been slower to embrace programs exploring medical humanities.[1,2] Suggestions as to why that is the case include: the existence of rigid social and educational hierarchies,[3,16] a disconnect between the local language of literature vs language of medical education [English], lack of elective learning opportunities in medical programs,[16] an emphasis on hard science rather than humanities during pre-medical school studies, and relative paucity of literature and art database indexes in South Asia.[17]

An additional factor for why medical students in South Asia may be slower to embrace medical humanities may lie in the type of students entering the medical programs. Admissions to medical schools in India and Nepal has been almost exclusively based on the students score on basic science (physics, biology and chemistry) multiple choice entrance examinations.[18,19] This is coupled by an early requirement for pre-med students to select one of three academic branches (science, management or arts, and humanities). With admission to medicine being highly competitive (0.035 admitted per 1000 population) it makes sense that South Asian students might select the science path over arts and humanities as they prepare to apply for medicine. In addition, there is a perception that early training in arts and humanities (pre medical school) is "looked down upon" by students.[20]

Art Making at PAHS, Nepal

An exception to the science focus of medical school admissions in Nepal is the PAHS, whose admissions process rewards both academic and non-academic achievements of the applicants.[21] The founding leadership at PAHS were open to exposing their students to an annual artistic pursuit, and were curious to explore the breadth and depth of artistic offerings and conceptual connections that could be achieved in doing so. The "My Heart, My Art" project was created in parallel with the cardiac science learning at the onset of the PAHS medical program in 2011. The result was a multiyear repository of cardiac art that afforded the authors the opportunity to examine the artistic and conceptual breadth and depth of understanding required by the students in order to create the art.

Curatorial analysis of the "My Heart My Art" collection resulted in the generation of four categories of art. The first, Anatomy Literal Representation, bore striking similarity to textbook or lecture diagrams of cardiac anatomy, often including labels of the individual parts. One possible explanation for this could be an interpretation by Nepali students of the exercise as more of a homework assignment rather than an artistic invitation. Some of the Nepali students, being from a younger demographic (average age 18 vs 24 in North American medical schools), and just finished their secondary education, may have completed the exercise by faithfully copying an image. In the business literature, there has been discussion on consumer's perception of authentic vs. copying. Chinese consumers (in contrast to Western consumers) do not evaluate products as binary: authentic vs inauthentic, rather they see copying as categorized into sincere and insincere, with the former being seen as very honorable.[22] Recognizing that Nepali culture is distinct from Chinese culture, nevertheless, by extrapolating from the field of business to the present context, "sincere copying" of heart diagrams can be seen as an entirely appropriate reaction to the call for art submissions.

Students whose art fit into the Artistic Representation category gave full license to their artistic, creative and fanciful imaginations. Art, in this category, ranged from purely artistic to images that made statements, illustrating that the students were making conceptual and metaphorical links between cardiac form and function (e.g. heart as a musical instrument, arteries nourishing the body, the heart as a pump). A metaphor can be an object used to represent something else. Duit suggests there is a valuable role for metaphors in the learning of science linked to the element of surprise associated with the image in the science context (e.g. the heart as a collection of

musical instruments).[23] PAHS students' use of metaphors in their art-making may have been contributing to their learning.

The art work demonstrated by students in the Tactile Renderings category could have been influenced by Nepali handicrafts. In Nepal, with its diverse background of cultures, ethnicities and languages, handicrafts have always played a key role as a form of expression for the people. The handicrafts in Nepal are largely influenced by use of natural products such as tree leaves, hemp, straw, and recycled products such as handmade papers. Such diversities were noted in the tactile renderings of the medical students, that ranged from two/three dimensional sculptures and installations, and that were assembled with materials found at hand e.g. clay, straw, and Styrofoam. The use of different materials in art is often governed by availability and the cultural habits of the communities.[24] The other possible explanation for students using these products could be the trend of "DIY" (do it yourself or upcycling/ recycling) crafts gaining popularity among the urban youth in Nepal in recent years. That a subset of medical students in this study were inclined towards art-making that required manual dexterity is consistent with the observation that students have a variety of learning styles (visual, auditory, read/write and kinesthetic) and show a preference for multi-modal learning.[25] If the students in this study were using the art-making as an adjunct to their learning it is not surprising that some would select a more "hands-on" art-making strategy.

PAHS was primarily designed to educate and graduate doctors for work in rural Nepal. One facet of this training involved community based learning and education (CBLE).[26] A portion of the CBLE curriculum involved community postings paired with written reflections. This focus on community health was reflected by the art in the category of "Linked to Health/Nepal"; it illustrated the students' keen understanding of non-communicable diseases (e.g. coronary artery disease and hypertension) that have been shown to be prevalent in Nepal.[27] Smoking was singled out as a critical risk factor for development of heart disease, and pointed to the high incidence of young women, in particular, smoking tobacco in rural Nepal. [28]

On the basis of studies carried out at "cardiac camps" held around rural and urban Nepal, authors have seen a need for education programs that promote preventative strategies and highlight modifiable risk factors in the hope that education of the young people can prevent the addictive behaviours from taking root.[27] PAHS students created art reflecting the need for health education in rural Nepal - they showed children gathered around a teacher, in a rural setting, and learning about the heart. A subset of cardiac art in this category focused on the role of good cardiac health in fostering the health of the Nepali population, thus making the country prosperous. According to the World Bank, fostering a culture of health education, particularly in the rural poor, may provide "one of the most timely and effective ways of promoting healthier lifestyles and averting the emerging pandemic of non-communicable diseases (e.g. heart disease) among the next generation of the poor".[29]

Practical Applications

For faculty who wish to embed an artistic experience in their medical science curricula we include some lessons learned as a result of conducting this study. At the very beginning, the introduction of the project to the students could include an explanation of the distinction between a "homework assignment" and an artistic submission, with an emphasis placed on

artistic interpretation. Secondly, there should be philosophical buy-in from the leadership of the school and from the basic science departments. This can be encouraged in several ways: having faculty as judges of the art submissions; supporting a formal presentation (e.g. Medical Grand Rounds) of all art submitted with a discussion about the role of art-making in development of empathy and communication in medical professionals; and by creating a permanent exhibit of the winning images on "a wall of honor".

Reflections

In addition to the four main curatorial categories, this study also identified the variations in quality of work across all submissions, ranging from art requiring advanced skills to novice creations. There were also artworks that ranged from highly creative to more of a literal translation. These variations could be explained by the fact that the students in PAHS were from diverse backgrounds both culturally as well as socioeconomically. One of the aims of PAHS was to provide equal opportunity to Nepalese youth aspiring to become doctors. The diversity in their exposure to art lessons in their earlier education could potentially have affected the diversity in their work.

Limitations

The data repository is from students from one medical school in Nepal, and as such the findings are not generalizable to all medical schools in South Asia. In addition, the authors contributing to the curation of the repository brought their own (creative/artistic) biases into the analysis.

Conclusions

From literal to artistic/fanciful representation, students' art revealed a strong conceptual understanding of the cardiac science topic. A subset of tactile art highlighted the student's manual dexterity and propensity for kinesthetic learning. The links made by their art to socially relevant health issues, illustrated the student's ability to connect science to the needs of their patient population, and the important role for education in disease prevention. This is the first study that has explored art-making in Nepali medical education and that finds a role for it as a potential adjunct to science learning.

At this crucial time in our world we end with an image titled "One world, One Heart: Beating for Compassion, Love and Peace" (Figure 11), which reminds us that our differences, rather than pulling us apart, should bring us together.

Figure 11:
'One World, One Heart'
by S. Gurung

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