Perspectives

Messages from a Medical Library in the Earthquake-Prone Zone

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On March 11, 2011 at 14:46 (Friday), a massive magnitude-9.0 earthquake attacked large areas of northeastern Japan, including Sendai City. The huge earthquake generated catastrophic tsunamis, leading to unprecedented disasters in the seacoast areas of the Tohoku region (about 20,000 dead and missing persons). Upon this earthquake, in Tohoku University Medical Library, a 3-storey earthquake-resistant building, most of books fell down from bookshelves on the second and third floors, but the bookshelves remained steady because of the effective fixation. Many piles of fallen books blocked up the walkways and the narrow passages between the bookshelves; namely, books are easily transformed to dangerous weapons in a shaking building. Fortunately, all library staffs and users evacuated outside the building without even a scratch. Importantly, we were able to open the first floor of the Medical Library on March 14 (Monday), because the first floor has been used for the Learning Commons, with open space for group meetings. We thus provided students, medical staffs, and faculty members with the comfortable place during the early stage of the disasters. In fact, medical staffs and faculty members worked hard over weekend to deal with many patients and clear the post-quake confusions. Moreover, electricity, gas, or water supply was not yet restored in most areas of Sendai City. In the earthquake-prone zones, the Medical Library should function as a facility that not only enhances information gathering but also provides the place like an oasis of relaxation for students and medical staffs upon great earthquakes.

Keywords: disaster; earthquake; learning commons; library service; medical library


On March 11, 2011 at 14:46, a massive magnitude-9.0 earthquake attacked large areas of northeastern Japan. The huge earthquake generated catastrophic tsunamis, leading to unprecedented disasters in the seacoast areas of the Tohoku region (Shibahara 2011). According to the National Police Agency, the numbers of dead and missing persons were 15,721 and 4,615, respectively (as of August 22, 2011). Almost all of victims are killed by the tsunami, known as “all or nothing” disasters. First of all, we extend our heartfelt condolence to the victims and their families of the 2011 Tohoku Earthquake and Tsunamis. We also extend our heartfelt sympathy to all the people who were affected by this earthquake and tsunami.

The 2011 Tohoku Earthquake (The Great East Japan Earthquake) caused severe damages to many libraries that are located in the Tohoku and the Kanto areas. Most of these libraries were forced to close for a long time. In contrast, on March 14, three days after the Earthquake, we were able to open the Tohoku University Medical Library, although the available space was restricted to the first floor that is used for the Learning Commons. We summarize what we did during the post-quake confusions and what we should do next as a library in the earthquake-prone zone.

Tohoku University Medical Library

Tohoku University Medical Library (Medical Library) is located in the center of Tohoku University Seiryo Medical Campus that currently consists of Tohoku University School of Medicine, School of Health Sciences, School of Dentistry, their respective Graduate Schools, Tohoku University Hospital, and Institute of Development, Aging and Cancer. The Medical Library was established in July 1915, initially affiliated with the Tohoku Imperial University, Medical School. After a number of subsequent changes in designation and organization, the Medical Library has been established as a specialist library with the role of bringing together all matters related to medicine and life science. In 1978, the Medical Library was designated as the Medicine and Biology Overseas Journal Center by the Ministry of Education of Japan. Since then, the Medical Library collects overseas journals not held in domestic institutions and provides a copying service for universities and research facilities across the nation. Currently, there are a total of 431,715 books (173,358 Japanese and 258,357 Western-language books) and 13,766 titles of journals (3,780 Japanese journals and 9,986 other journals).

The quake-resistant building of the Medical Library was constructed in 1984 as a 3-storey building. Since 2010,
the first floor is used for the Learning Commons, also known as Information Commons (Russell and Barbara 2002; EDUCASE 2011), which represents the learning space with network station, meeting room, and relaxing zone.

**Experiencing the 2011 Tohoku Earthquake**

On March 11 at 14:46 (Friday), the strong shake continued for 2-3 minutes, and the electricity went out immediately, except for Tohoku University Hospital with its own electricity. There were two peaks of the shaking with a 30-sec interval. Upon the second peak, a large number of books fell down from the bookshelves that had been properly fixed, with releasing dense dust. There were many piles of fallen books even in the walkway (Fig. 1). For a while, we could not see anything with dense dust around. The Medical Library, located in the center of Sendai City, was not attacked by the tsunamis, although they washed out the seacoast areas of Sendai City and the Sanriku Coast of the Tohoku region (Shibahara 2011).

When the quake trailed off, the staffs faced the evacuation conduct of the users who remained inside the library building. Most of books fell down from the bookshelves especially on the second and third floors. The piled books blocked up the walkways and the narrow passage between bookshelves. We carefully checked whether someone was buried with many fallen books (Fig. 2). Fortunately, the bookshelves remained steady without any damage (Figs. 1-3), indicating that the fixation of bookshelves was effective (Fig. 3), which was a lesson learned from the 1978 Miyagi Oki Earthquake (magnitude 7.4). All staffs and users could evacuate outside the building without even a scratch. We closed the Medical Library because of the power failure and the continuous aftershocks.

On March 12 (Saturday) around the noon, the electricity supply was restored in the Seiryo Medical Campus. We checked the damages of the Medical Library building and found structural damages in the ceilings of the second and third floors, such as dropped exhaust vents, broken smoke-proof glass (Fig. 4), and cracks all over the walls. In contrast, there were only minor damages on the first floor that has been used for the Learning Commons (Fig. 5).

**Strenuous efforts toward restoration of the Medical Library**

On March 14 (Monday), three days after the earthquake, we managed to open the first floor, aiming to provide students, medical staffs, and faculty members with the...
comfortable space (Fig. 5). At that time, many students have been forced to stay at the Seiryo school gym as an evacuation center, because electricity, gas, or water supply was not yet restored in most areas of Sendai City. In addition, medical staffs and faculty members worked hard during the weekend after the Earthquake. In fact, many patients were transferred to Tohoku University Hospital from the seacoast areas. The first floor of the Medical Library provides an open space for the Learning Commons, with many sets of computers (A), tables (B), and meeting space (C). The corner near the entrance provides the zone like an oasis of relaxation for library users (C, D). Newspapers are also available in this corner (C, D). Note that the photos presented were taken in the middle of August 2011.

On March 15, Internet access was resumed, and the electronic journals and the databases became available. In addition, various supports were provided to the medical staffs in the distressed areas immediately after the earthquake. In terms of medical information, the publishers, the medical libraries, and research laboratories offered a variety of online resources free of charge for the disaster medical treatment from home and abroad.

The library staffs worked with patience to return the fallen materials to the bookshelves on the second and third floors. By the end of March, the library staffs finished the recovery work on the second floor, and started to work on the third floor.
On April 1, the Medical Library restarted a copying service for universities and research facilities in Japan.

On April 7 at 23:32, the magnitude-7.1 earthquake, the biggest aftershock, attacked the Tohoku region. Upon this attack, many books, which had been returned to the original place, fell down again from the bookshelves, generating the piles of books on the walkways and the narrow passages between bookshelves. The condition was similar to that seen on March 11 (Figs. 1-3). Thus, we had to repeat the hard and tedious work to return the fallen materials to bookshelves.

On May 13, the second floor was opened, but the third floor was still under the restoration construction.

On June 14, the 100th anniversary memorial day of Tohoku University Library (founded in 1911) was modestly celebrated in the Medical Library. The restoration construction of the third floor was close to the end.

On June 20, the Medical Library was fully opened after three months of recovery efforts from the 2011 Tohoku Earthquake. Such a delay was unavoidable, because of the shortage of engineers and workers for restoration construction upon the great earthquake.

Lessons learned from the 2011 Tohoku Earthquake

- As the Medical Library in the stricken area of the 2011 Tohoku Earthquake, we have to preserve and transmit various aspects of information concerning the Earthquake and Tsunami to the future generations. A good example is the Great Hanshin-Awaji Earthquake Disaster Materials Collection of Kobe University (http://www.lib.kobe-u.ac.jp/eqb/e-index.html).

- Hereafter, we are unable to escape from great earthquakes (Minoura et al. 2001), but we can prevent or minimize the human damages. We need not only to design the building to withstand earthquakes, but also to hold books and bookshelves steady, attach safety stoppers on bookshelves, and make a certain distance between bookshelves and reading desks. As a concrete measure after the 2011 Tohoku Earthquake, we have decided not to use the top shelves and thus taken down books from the top shelves. Upon a great earthquake, books in themselves are easily transformed to dangerous weapons.

- The attachments in the ceilings are relatively fragile, such as exhaust vents and smoke-proof glass (Fig. 4). These attachments should be carefully designed to prevent the drop.

- Further development of the facility for the Learning Commons is important for every library in the earthquake-prone zones. In the space for the Learning Commons, there are many sets of computers and meeting rooms, without arrays of bookshelves (Fig. 5). Accordingly, we could avoid the falls of books and the collapses of bookshelves, and provide the relaxing zone (Fig. 5C and D).

Lastly, we would like to express our gratitude to many people and organizations for the large support and kindness from home and abroad. We also thank library users who patiently waited for the restoration.

We hope that the Medical Library can function as a facility that not only enhances information gathering but also provides the place like an oasis of relaxation for students and the medical staffs upon such catastrophes.

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Conflict of Interest

The authors have no conflict of interest.

References


