

Stress and coping strategies for international students in China during COVID-19 pandemic

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Abstract

Background: The contagious COVID-19 coronavirus was first identified in Wuhan city of China and its rapid spreading led to the historic nationwide lockdown of China from January to April 2020, which imposed a heavy impact on both the routine life and the mental health. The international students studying in China experienced this lockdown, during which their stress, anxiety and the coping strategies employed need to be explored.

Methods: One hundred international students studying in different provinces/cities in China were surveyed by completing online questionnaire to evaluate the stress and anxiety and to identify the factors responsible for the stress and the effective coping strategies used during the nationwide lockdown of China.

Results: The study reveals that 84% of the students were worried about the pandemic while 70% students were observed to be stressed at the self-identified medium level during nationwide lockdown. Factors closely related with study performance were the most influential for international students. Indoor aerobic physical exercises were most widely employed by the international students to cope with stress. In this study, we also noticed that 15% of international students did not do any particular activities to cope with stress or using alcohol or smoking as stress coping strategies.

Conclusion: The study recommends that the international students in China need to be trained and educated for stress awareness and coping to improve their physical and mental health for better academic performance during emergency situation like

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nationwide lockdown.

Keywords: COVID-19; International students; China; Stress; Anxiety; Indoor physical activity; Stress coping

Highlights

- International students in China got stressed during the nationwide lockdown of the COVID-19 pandemic from January to April 2020.
- Study-related issues represent the major factors responsible for the increased stress.
- International students most widely used indoor aerobic physical activities to cope with stress.
- The traditional Chinese physical activities Tai Chi and Qigong were practiced by a small portion of international students to cope with stress.
- Over 15% of international students used alcohol and smoking to cope with stress.
- Education for stress awareness and management is needed for international students.

1. INTRODUCTION

As a normal part of life, the human body always experiences stress and reacts to it physically, mentally, and emotionally. The appropriate level of stress can keep a person positively motivated and helps to maintain physical and mental health. However, the frequent high-level or long duration of stress without relief can build stress-related tension, leading to distress (1-3). Distress is a negative stress reaction that can lead to emotional problems including worry, severe anxiety, tension, frustration, and depression; physical symptoms such as headaches, stomach upset, chest pain, elevated blood pressure, sleeping problem and sexual dysfunction; development of diseases such as cancer, heart disease, lung ailments, and liver disease; and even suicide (4, 5). In order to relieve stress, some persons compulsively use substances such as food, alcohol, tobacco, and drugs or behaviors including gambling and sex. Rather than reducing stress, these substances and compulsive habits tend to keep the body stressed or worsen it. (5-7).

In 2018, 1,004 higher education institutions in 31 Chinese provinces (autonomous areas and municipalities) hosted 492,185 overseas students from 196 nations and territories. (8). In addition to the personal stress that is resulted from personal relationships, academic problems, financial problems, religion, the sense of values, and future prospects, which all students will experience during their college life (9-13), the international students in China endure social distance and adaptation stress of exposure to unfamiliar cultural environments. However, little is known about the physical and mental health of those international students who are away from their familiar environments and enter into a distinct Chinese culture.

A rare viral disease, Coronavirus disease 2019 (COVID-19), was initially found in Wuhan, the capital of China's Hubei province, in December 2019. (14, 15). COVID-19 is a contagious respiratory disease caused by the coronavirus 2 that causes severe acute respiratory syndrome (SARS-CoV-2) (16, 17). SARS-CoV-2 is causing a pandemic that is still going on. (18). To prevent the spread of SARS-CoV-2 during the early stages of the COVID-19 pandemic, China's central government implemented a statewide lockdown from 23 January to 8 April 2020, restricting mobility, allowing only one person per home to leave every two days, and

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closing most highway exits (19, 20). The outbreak of COVID-19 imposed stress by causing a series of fear and anxiety. The fear and worry about health, such as being infected by SARS-CoV-2, worsening chronic health problems, or mental health conditions can cause strong emotional reactions (21-24). The public health actions and social measures taken during the nationwide lockdown, including social distance, frequent hygiene measures, and freedom freezing, can make people feel isolated, further increasing stress and anxiety. While those actions are all necessary to stop the spread of SARS-CoV-2 during COVID-19 pandemic (25), coping with stress that is associated with the pandemic and its social countermeasures in the right way is also critical for the people to keep healthy in the war against COVID-19 (26). During the nationwide lockdown of China, the international students in China have to endure multiple layers of stress. If the stress is not properly relieved, it may be internalized and then negatively influence the health or become obstacle to optimal learning performance.

This study investigates the status of stress and anxiety of international students in China during the nationwide lockdown of COVID-19 pandemic from January to April 2020. The factors that affect the stress and the effective stress coping strategies employed by international students are also identified by completing a self-reported questionnaire survey online. Our study confirms that the international students faced stress, nervousness, and anxiety due to COVID-19 pandemic lockdown and reveals that indoor aerobic physical activities are the effective stress coping strategies used by most international student participants.

2. METHODS

2.1. Research design

This study was designed at the School of Physical Education, Shanxi University, China, from 25 April to 30 May 2020 during the nationwide lockdown of China due to the outbreak of COVID-19 pandemic. The study aimed to investigate the status of stress and anxiety among international students residing in China, identify the factors that contribute to stress and find the effective coping strategies that were most widely used. The study was conducted through an online questionnaire that was sent to each student. The students were also contacted for informed consent and study-related information.

2.2 Sample

A total of 100 international students studying in various parts of China were included in the survey. The survey was completed by delivering an online self-reported questionnaire. The international students who participated in the survey were from 18 different countries, including Pakistan, India, Uzbekistan, Tajikistan, Iran, Ukraine, Germany, United States of America etc. and were studying in higher education institutions of 8 different provinces/regions of China. All the participants were informed of the purpose of the study.

The majority of participant students (61%) were enrolled in the doctor of philosophy (PhD) program while the remaining were in Master Program (30%) or Bachelor program (9%) (Figure 1B).

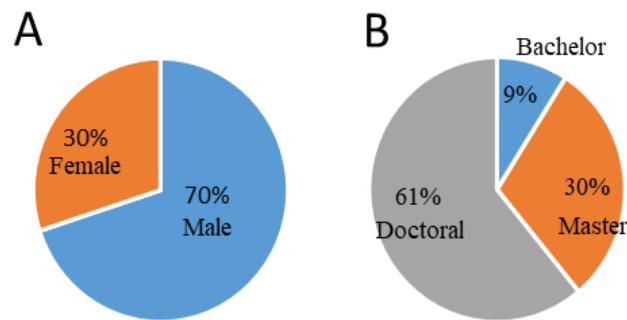
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Figure 1. (A) Gender and (B) Degree-wise distribution of the participant students (n=100)

2.3. Data collection and analysis

The questionnaire was created following a thorough review of the literature. (55) It included a brief note outlining the survey's goals, as well as a section with demographic data about the participants and a total of 22 questions. The students were asked to rate their stress levels on a scale of one to three (high, medium, or low). Academic success, family and friendships, financial matters, health, self-confidence, workload, COVID-19 threats, and other topics were all addressed in the survey. The pupils were also asked to identify the effective stress coping mechanisms they employed throughout the COVID-19 pandemic's statewide lockdown. Students who responded the online survey produced through Google forms with an attached consent form were selected using a simple random sample technique. The poll link was shared on social media with the student responders. The questions were adopted from Akan et al. (2010), Khalid et al. (2016), Roy et al. (2020), and Ahorsu et al. (2020) studies and tweaked to fit the study's setting. Only pupils with internet access were included in the study. A total of 100 students attended, including international undergraduate and postgraduate students studying in China.

3. RESULTS

As shown in Figure 2, 84% of student participants were worried because of the COVID-19 outbreak and the nationwide lockdown, but 70% of students rated their stress at the medium level, demonstrating the clear impact of COVID-19 on them the international students in China. Furthermore, the stress of each student was affected by multiple factors, in which study-related issues, including the new experience of the online class system, represent the most influential factors in stress induction (Figure 3). In addition, it was also noted that watching the news and spending time on different other social media platforms was also the prime cause behind the increasing anxiety and nervousness among the students (Figure 3).

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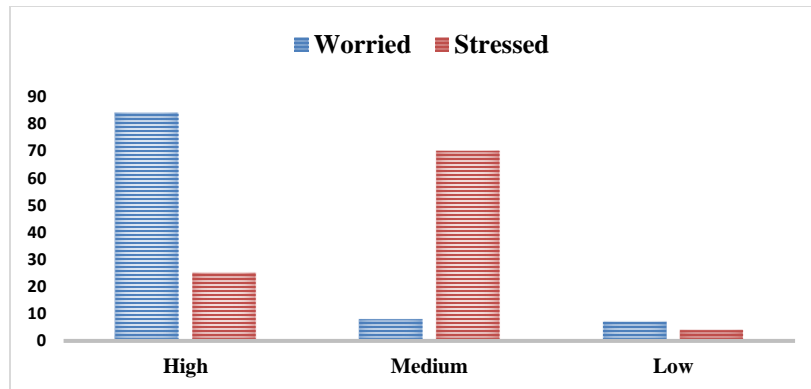


Figure 2. Comparison of stress and worriedness among the international students during epidemic prevention period

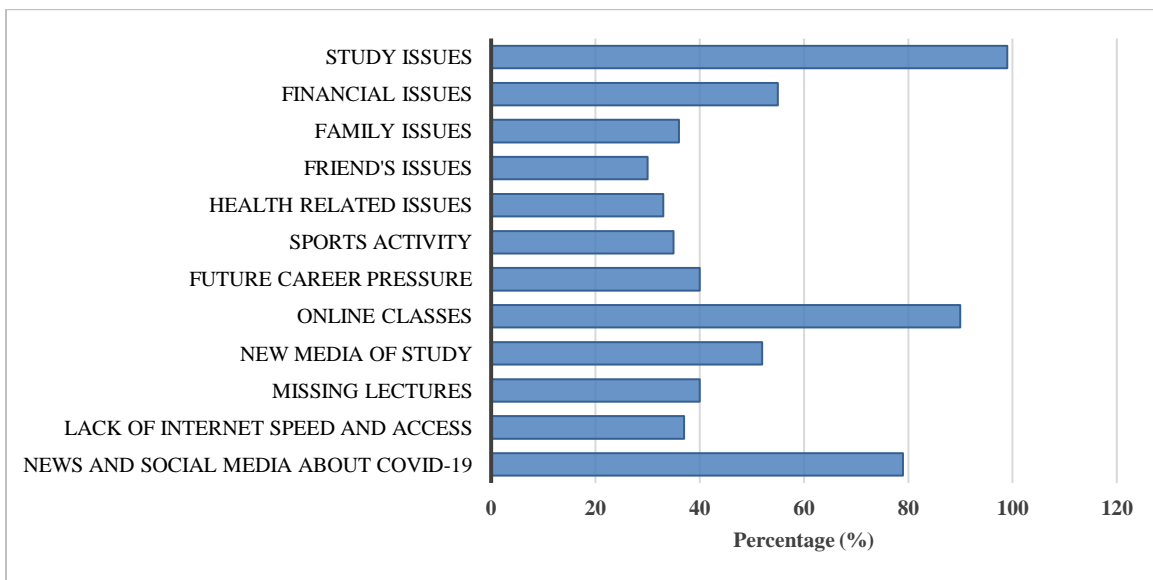


Figure 3: Factors that caused stress, anxiety and nervousness among the international students ($n = 100$)

The stress and nervousness due to the COVID-19 outbreak and nationwide lockdown led to various anxieties among the international students. Five manifestations that over 50% of participant students had include irritation, not dealing effectively with the things that need to be done, worrying about things that may happen unexpectedly, being unable to control the important things in routine life, and losing confidence to handle personal problems (Figure 4).

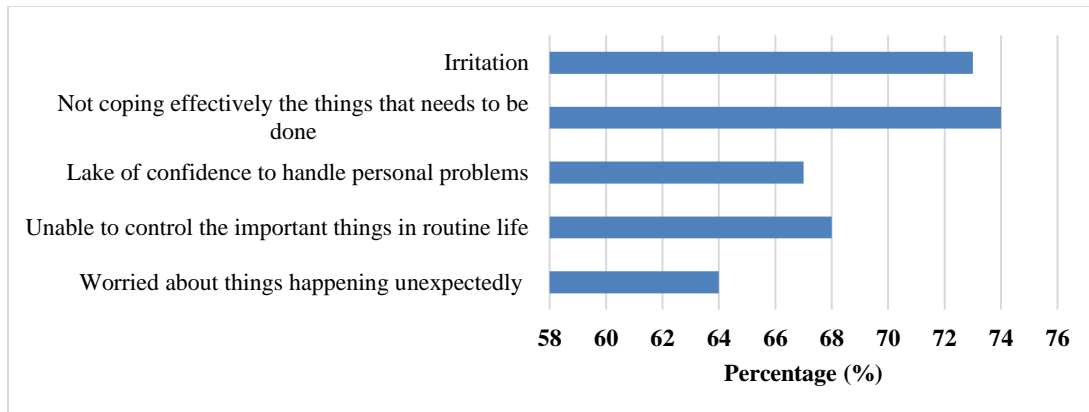
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Figure 4. Outcomes/effects of stress and nervousness among the students ($n = 100$)

To investigate the status of stress coping, students were asked to identify the most effective coping strategies they used during the nationwide lockdown of COVID-19. Interestingly, most of the students came up with multiple stress coping strategies. As shown in Figure 5, indoor jogging and walking exercise is the most often used strategies by students (91%), followed by surfing on social media and video games (70%), talking to family and friends (45%), indoor Yoga (41%), and music and movies/entertainment (39%). Some international students started practicing traditional Chinese physical activities such as Tai chi (21%) and Qigong (16%) to reduce the stress of Covid-19 lockdown. Noticeably, a significant number of international students coped with stress by smoking (19%) and drinking (16%). Indoor aerobic physical exercise, students usually performed moderate-intensity aerobic activity, e.g., brisk walking for 150 minutes every week (30 minutes a day) or vigorous-intensity aerobic activity (6%), e.g., jogging and running for 75 minutes a day (Figure 6). It was also observed that around 15% of international students were not engaged in any particular aerobic activity to deal with stress during nationwide lockdown (Figure 6). In addition to reducing stress and anxiety, other purposes of indoor physical exercises were improving mood and boosting energy (58%), combating health conditions and diseases (37%), controlling weight (35%) and promoting better sleep (34%).

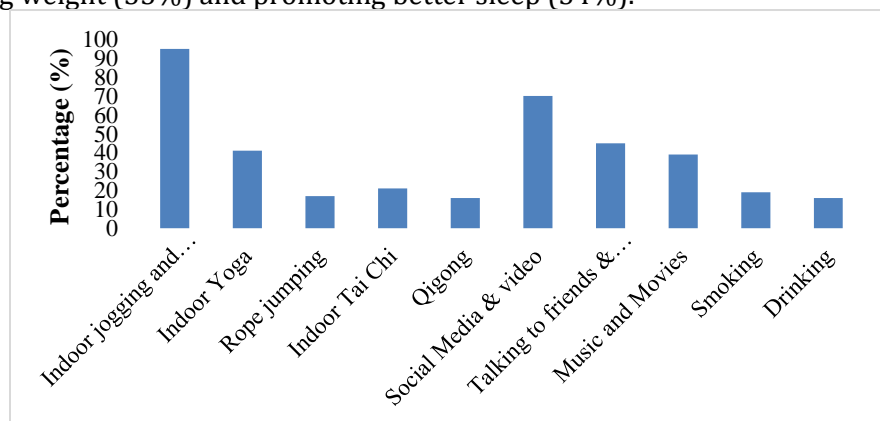


Figure 5. Stress coping strategies among the students

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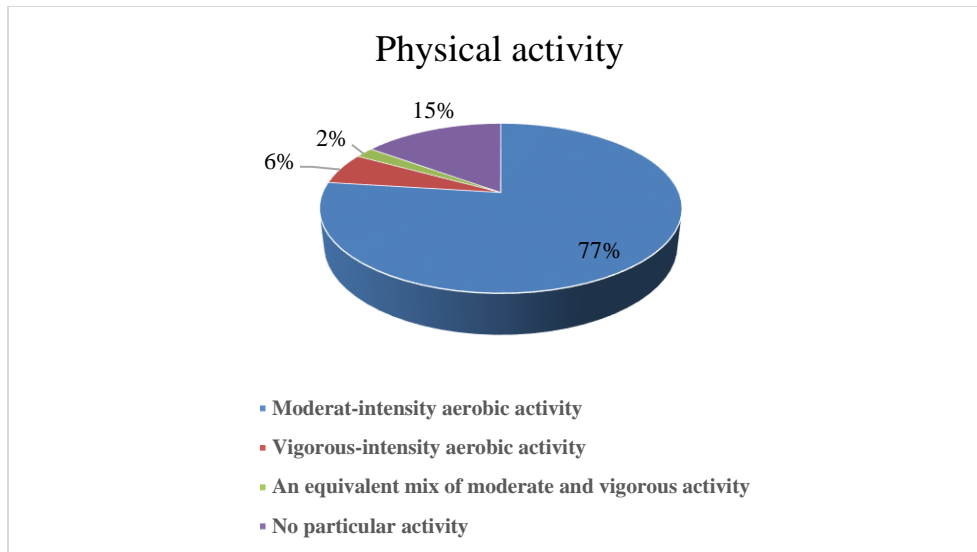


Figure 6. Indoor aerobic physical activities performed by international students

4. DISCUSSION

The present research aimed to explore the levels of psychological distress such as stress and anxiety among the international students who were studying in China during the nationwide lockdown of COVID-19 pandemic and to identify the coping measurements. The data was collected from the international students who preferred to stay in China and did not return to their home countries during the outbreak of COVID-19. Our results revealed that the majority of students got worried while a significant number of students were stressed because of the epidemic of COVID-19 outbreak. Both academic and social factors were found to be involved in the increase of stress and anxiety among the students and lead to changes in both behavior and routine life, which is in consistent with the study reported by Harper et al. (31) which identified that the main factors causing stress and anxiety among the international students are the study-related issues, such as learning in the physical absence of teachers, newly introduced system of online classes, fear of failure to achieve target academic goals and missing lectures due to internet problems. Unexpectedly, social media and news were also the factors causing an increase in stress, fear, anxiety, and nervousness among international students. The fear and nervousness among the students may cause a change in student's behavior and compromise the academic performance in learning (31, 32). Our study also revealed that most international students employed indoor physical activities and exercised to cope with stress, anxiety, fear, and nervousness during the nationwide lockdown of COVID-19 pandemic. These results are in agreement with the findings of Tyson et al. (2010), who reported that physical activity and exercise represent the most effective strategies in coping with stress, anxiety and worriedness and in improving mental health (33). Physical exercise can be classified as aerobic exercise or anaerobic exercise, or defined as regular habitual exercise or as acute single bout exercise. The health benefits of physical exercise are well documented in the literature. The major consequence of habitual exercise is the physiological adaptation usually reflected by the reduced heart rate, decreased blood

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pressure, and increased parasympathetic activity, which is thought to yield a similar response to psychosocial stressors. Exercise was effective in reducing reactivity to stressors in terms of heart rate, diastolic and systolic blood pressure, or self-reported stress, according to an early meta-analytic analysis of the connection between aerobic exercise and stress reactivity (34). Another meta-analysis of published trials involving adult human participants looked at whether physical activity can reduce cardiovascular reactivity and aid recovery from acute psychological stressors. Fit and healthy people had a much lower heart rate and a tendency to have lower blood pressure reactivity, according to the findings. Fit and healthy people also recovered their heart rate faster, while there were no significant differences in systolic or diastolic blood pressure recovery (35). These findings highlight the benefits of physical exercise in terms of increased physiological reactivity and recovery from psychosocial stressors. Furthermore, according to a systematic review of randomized controlled trials (RCTs) that looked at the effect of acute aerobic exercise on blood pressure responses to psychosocial laboratory tasks, even a brief bout of aerobic exercise appears to have a significant impact on blood pressure responses to a psychosocial stressor (36).

Meditation has already been demonstrated to have beneficial impacts on stress reduction, physical and mental health, and cognitive performance. Meditation's effects are assumed to be linked to the creation of a calm state of mind. Mindfulness meditation is a nonjudgmental observation of present-moment phenomena that has been proposed as a stress-relieving technique (38-40). None of the students in this study said they used mindfulness meditation as a stress-reduction technique. Many students, on the other hand, used traditional Chinese physical exercises like Tai chi and Qigong to cope with stress and worry. Tai chi (Chinese: 太极) is an internal Chinese martial art that is practiced with extremely slow motions for the sake of self-defense and healing. Coordinating posture, slow-flowing movement, deep rhythmic breathing, and a quiet meditative frame of mind are all part of Qigong (Chinese: 气功). Although Tai Chi and Qigong are closely connected, they are often classified as distinct techniques. The latter's focus is usually on health rather than martial applications. A large number of clinical studies focusing on specific diseases and health conditions, such as hypertension, diabetes, osteoarthritis, osteoporosis or osteopenia, cancer, heart failure, chronic obstructive pulmonary disease, coronary heart disease, schizophrenia, and depression, have documented the safety and health benefits of Tai Chi (41-46). Tai chi is a Chinese martial art that can help older people avoid falling (47). Tai Chi combines physical exercise with mindfulness practices, making it an excellent way to treat stress and related ailments. Tai Chi is likely to help participants by enhancing flexibility, reducing depression symptoms, decreasing anxiety, and boosting interpersonal sensitivity, according to a comprehensive study of the health effects of Tai Chi for students in higher education (48). Tai chi can also help with lung capacity, balance, 800/1000m run time, sleep quality, compulsive, somatization, and phobia symptoms, and decreased anger (48). A study comparing the effects of Tai Chi and walking training on aerobic fitness, resting energy expenditure, body composition, quality of life, and energy metabolism during exercises discovered that while Tai Chi consumes less energy metabolism, it provides similar health benefits to self-paced brisk walking (49).

Exercise, recreation, relaxation, self-healing, self-cultivation, and martial arts training are just a few of the reasons why people practice Qigong. Even crippled and injured people can

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practice Qigong because it can be done laying down, sitting, or standing up. Hypertension, menopausal syndrome, chronic fatigue syndrome, insomnia, discomfort, cervical spondylosis, and myopia are just a few of the ailments that Qigong is used to treat. It's utilized as an alternative medicine in China to enhance conventional medical treatments for relaxation, rehabilitation, and the treatment of specific illnesses (50). Due to the lack of unwanted effects reported in clinical research, qigong is considered safe for a wide range of people. A number of clinical studies have looked at the impact of Qigong on a variety of medical issues, including bone density, physical function, falls and related risk factors, quality of life, immunological function and inflammation (51), hypertension (52), pain (53), and cancer treatment (54). Qigong has been shown to improve mood, reduce stress reactions, anxiety, and sadness, among other things (51).

5. CONCLUSION

In this self-reported survey-based study, we confirm the stress and anxieties brought on by the outbreak of COVID-19 and subsequent nationwide lockdown for the international students in China. This report also reveals that international students most widely used indoor aerobic exercises to cope with stress. As a sign of cultural adaptation, many students practiced traditional Chinese physical activities Tai chi and Qigong. However, there are still a portion of students who did not do any particular activities or using alcohol or smoking to cope with stress. This study suggests that the international students in China need to be educated to cope with stress, anxiety and fear by training with indoor physical activity and exercise. The students also need the courses to learn about stress awareness, managing self-study, handling the mental and physical health-related issues for the emergency situation like the nationwide lockdown of COVID-19.

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Authors' contributions

NR and YHL conceived the study; NR, MT and YHL, designed the study, collected and analyzed data; NR, YHL supervised the study; NR and YHL wrote original draft, YHL and MT reviewed and edited. All authors have read and agreed to the published version of the manuscript.

Competing interest

The authors declare that they have no competing interests.

Data Availability Statement

The data that support the findings of this study are given in the main script and supportive materials. For any further details and data, contact the corresponding authors (Nadeem Roy, Ying-Hai Liu).

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