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Research paper

Integration of traditional and 'modern' medicine: Reflections on a visit to DPR Korea

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ABSTRACT

Introduction: Many traditional, complementary and alternative medicine systems are used throughout the world. The reasons for use and government support of these systems vary. In the Democratic People's Republic of Korea (DPR Korea, i.e. North Korea) traditional Koryo medicine is strongly supported by the government, reportedly providing around half of all healthcare services and medicines. The purpose of this paper is to impart reflections from a short stay in the little visited country of DPR Korea, provide some insights into their healthcare delivery, and reflect on transferable lessons that support traditional medicine integration with national healthcare systems.
Methods: Field notes and photographs from a trip to DPR Korea were used to aid the writing of this reflective piece. Information drawn from broader literature provides contextual and comparative background and discussion.
Results: Contributing to the strong level of provider-level integration of traditional Koryo and biomedical approaches to healthcare in DPR Korea are the high level of government recognition of Koryo medicine at a constitutional level, and the education of all medical students (traditional and biomedical) in both traditional and biomedical healthcare practices.
Discussion: While DPR Korea is the focus of this piece, more health services research is needed internationally to provide better understanding of what are best practices of integration of traditional and complementary medicine systems with national healthcare systems, and the population health impacts of such integration.

1. Introduction

In October 2015 the Democratic People's Republic of Korea's (DPR Korea) Ministry of Public Health co-hosted the World Health Organization's (WHO) South-East Asia region's Traditional Medicine Workshop. DPR Korea is one of eleven Member States within the WHO South-East Asia Region. The three day workshop was to *Share Experience and Evidence on Appropriate Integration of Traditional Medicine into National Health-care Systems.* The author attended as an expert resource person, having provided the workshop background document based on the author's report that reviewed integration of traditional medicine within the national health systems of the South-East Asian Member States [1]. At the close of day two, the *Traditional Medicine Action Plan for the South-East Asia Region* was agreed [2]. On day three all delegates visited several healthcare facilities in Pyongyang and one outside the city limits in nearby Junghwa county, North Hwanghae province. Below, these visits are outlined, and reflections made on DPR Korea, its system of traditional and biomedical integrated healthcare, and lessons from DPR Korea regarding integration of traditional medicine with national healthcare systems. This perspectives piece is situated within the larger context of global policy support for traditional medicine integration with national healthcare systems. The author's personal impressions (see Box 1 and Box 2) and some photographs of this little visited country are included as a means to provide some limited context to healthcare delivery in DPR Korea.

2. Public health in DPR Korea

DPR Korea gained independence from Japan in 1945; the communist state of the Democratic People's Republic of Korea was then founded in 1948. DPR Korea's population (approximately 25 million people, estimated July 2016) is mostly ethnically homogenous, but includes a small Chinese community, some Japanese, and a small expat community related to various embassies and non-government organisations. Under the communist state, education and healthcare are free

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Box 1. First impressions.

On approach to Pyongyang airport on a mild afternoon, I looked down upon a tranquil, rural vista. Small dwellings were scattered across an expanse of harvested fields dotted, at precise intervals, with stacks of hand bundled sheaves of grain or hay. While taxiing towards the airport terminal, we passed parked planes with their cockpit windows and wheels blanketed with white covers. The unloading crew emptied the luggage from the plane watched by military personnel; a few bags did not arrive, mine amongst them (the bag was later located and delivered). While attending to paperwork related to my bag all of the airport lights went out and we (those waiting for bags, local chaperones and a handful of airport staff) looked to each other through the darkness until the lights were switched back on. With normally just one flight in and out per day from Beijing–one of the only entry ports to Pyongyang by air–the airport lights were turned off once the passengers had cleared. Later, from my room high in the Yanggakdo International Hotel, on an island in the middle of the wide Taedong river, I gazed at the high-rise skyline of Pyongyang. The modern city juxtaposed with the country's idiosyncrasies: visitors have no means to access money or mobile phone services; there is limited internet and email access (if any); visitors are constantly chaperoned when away from the hotel; and paper rather than electronic airline tickets are still required (presumably because there is no internet at the airport to process electronically issued tickets). I was surprised to find BBC and Al Jazeera news on my hotel room television, knowing that most citizens could not access such international broadcasts.

and unity and equality between all citizens are expressed as tenants fundamental to the societal structure.[1] According to the CIA World Factbook [3], 100% of DPR Korea's population over 15 years old are literate. Infant mortality, an indicator of population health, is around 22.9 deaths per 1000 live births; while not at the level of high income countries, there are many countries with worse infant mortality rates (see Table 1). Life expectancy for women is 74.5 years and for men 66.6 years. Most of the population (99.7%) have access to improved drinking water and 81.9% to improved sanitation. Obesity and its related public health problems are not a great concern (2.5% of population are obese), but around 15.2% of children under 5 years of age may be underweight [3].

While DPR Korea has an extensive health infrastructure, poor quality of health services, particularly at the country and rural (Ri) levels, are reportedly a significant concern – in part constrained by lack of financing for operational costs. Limited roads and communications infrastructures, and unreliable electricity, heating and water supplies are cited as preventing optimum performance of the health system. Health systems data has been described as "sub optimal in terms of its accuracy and completeness" [4]. Famine, economic crisis and international isolation have impacted public health in DPR Korea over the years [5].

[1] For example, a very large and striking statue in Pyongyang symbolises unity, knowledge and equality between genders and occupational groups. The statue is of a worker (a man holding a hammer), a farmer (a woman holding a sickle), and an intellectual (a suited man holding a calligraphy brush). All three figures carry books to symbolise knowledge and education. There is a sense of movement to the statue with all three figures stepping and looking forward across the river, one arm raised to unite the hammer, sickle and calligraphy brush.

Box 2. Observations of healthcare facilities.

Pyongyang

Our delegation visited the *Okryu Children's Hospital*, the *Breast Cancer Institute of Pyongyang Maternity Hospital*, and the *Academy of Koryo Medical Science* (established 1961) and saw first-hand the modern delivery of Koryo medicine and its co-location and integration with 'modern' biomedical practices. The first two facilities were in contemporary multi-story buildings, and the Academy, built some time earlier, was of a more traditional, yet grand design. We sat for a brief lecture at the *Academy of Koryo Medical Science.* The Academy was described as the national centre for Koryo research, therapy and prevention – comprising multiple institutes, research departments and clinics. We were invited to look closely at cabinets containing ancient Koryo medicine texts, examples of manufactured herbal medicine (e.g. Korean ginseng, 'tiger bone liquor', 2 ml glass ampules of injectable herbal medicines).

During the tours of each of the facilities, translators and chaperones explained as we observed interactions between doctors and patients, the latter wearing hospital issued striped pyjamas. At the Academy we were shown computer assisted Koryo diagnostic testing (including study of auricular acupoints), and therapies such as cupping, acupuncture and moxa treatments. In the hospitals we were shown all of the expected medical departments and imaging equipment such as x-ray and MRI alongside treatment rooms where traditional therapies were performed. On the walls of the women's hospital were posters showing common Koryo medicines including Korean pine, ginseng, red dates and musk deer. In the children's hospital we saw telemedicine in progress with doctors in Pyongyang consulting remotely via large-screen TV with a physician and patient in another province, and we watched as children demonstrated exercise equipment for physiotherapy, and others showed us their work in the schoolroom. The corridors and open spaces of the children's hospital were brightly decorated with artificial flowers, murals and large cartoon characters, including Winnie the Pooh and Disney-like creations such as castles, princess and princes.

Junghwa county

The smiling director of *Ryongsan Ri,* a small county hospital in a village in the province neighbouring Pyongyang, warmly greeted our delegation outside of her hospital. We arrived after travelling a long, concrete road planted, for tens of kilometres, with a single line of pink flowering plants–perhaps *Cosmos bipinnatus.* Not a dwelling nor building had been in sight during most of the drive, yet there were dozens of people working along the roadside, tending trees and neatening the verge. Few cars passed during the drive. The director provided us with a bountiful afternoon tea including baked yams, Korean dates and peanuts. Her hospital, able to accommodate a few in-patients, was very modest compared to those in the capital, but very grand compared to its neighbouring dwellings. The availability of Koryo medicine was evident. The storeroom was neatly stacked with boxes and bags of dried herbal medicines (see Picture 3), its cupboards arranged with small packages of medicine. A wooden, lathe-turned mortar and pestle sat alongside guillotine-like implements for chopping and preparing herbs. In the treatment room a box contained equipment for cupping, moxa and acupuncture (see Picture 1). The decorated glazed ceramic cups looked rustic and more traditional than the uniform glass cupping equipment we saw in the capital. On the terrace outside, on a large plastic

sheet, were neat piles of a dozen or so herbal medicines laid out to dry.
(See also [6])

3. Healthcare in DPR Korea

Healthcare is provided by the Ministry of Public Health at central, provincial and county/primary care (Ri) levels. In- and out-patient treatment is free and medicines can be purchased at low cost from dispensaries. Traditional Koryo medicine (Koryo means Korea) is offered alongside modern[2] medicine. In the biggest hospitals (central level) Koryo medicine reportedly makes up around 30–40% of treatments, 40–60% at the provincial/county level, and 70% at the peripheral/primary (Ri) care level [6]. There are specialist Koryo traditional medicine hospitals, and departments of Koryo medicine are reportedly co-located in every central and provincial biomedical facility, and at all (many thousands) county level hospitals and clinics [6]. Underpinning the acceptance and high use of traditional medicine is high-level government support for Koryo medicine including public health law (since around 1977) that provides Koryo doctors with the same rights and state legal protections as modern medical doctors [7–9]. An English booklet given to WHO delegates at the *Academy of Koryo Medicinal Science*, referred to Koryo medicine as the "pride of nation", part of Korea's "precious cultural heritage" that will contribute to the development of the world's traditional medicine [9].

Koryo medicine is based on ancient tradition, but since the 1950s its practice using 'modern' scientific methods, knowledge and technical assistance has been encouraged[5] – making its development similar to the development of Chinese medicine in China [10]. Koryo medicine is now often practised with modern diagnostic facilities, laboratory examinations and objective testing. Traditional treatments include acupuncture, moxibustion, cupping, massage, hydrotherapy, and herbal, mineral and animal-based medicines (see Picture 1). In practice, modern (biomedicine) and traditional treatments are often combined, and traditional treatments modernised [7]. Public health law requires that traditional medicine practices are combined with allopathic diagnoses in medical establishments[11] so that a single, scientific diagnosis can be established rather than using 'pattern differentiation'-based traditional diagnoses [5].

Students majoring in modern medicine compulsorily learn some traditional medicine and Koryo medicine doctors compulsorily learn a significant amount of western medicine over their six to seven year curriculum [8]. Both are instructed in medical sciences such as anatomy, physiology, biochemistry, pharmacology, and pathophysiology; but Koryo medicine students have fewer hours of instruction in their western medicine subjects which include (but not limited to) general surgery, general internal medicine (including biomedical diagnostics), radiology, psychiatry, paediatrics, obstetrics and gynaecology [5]. "Comrades' collaboration" is officially encouraged, that is, collaboration and respect between traditional and modern medicine colleagues [5]. Traditional Koryo doctors also use modern medical methods, prescribe pharmaceutical drugs and may participate in surgery. Likewise, doctors of 'modern' medicine can provide Koryo treatments, such as acupuncture and traditional medicines, without restriction. In this way integration of the two medical paradigms occurs at the practice and service-delivery level. Traditional medicine manufacturers and pharmacists do not produce or handle biomedical pharmaceuticals and biomedical manufacturers and pharmacists do not produce or handle traditional medicine products [5,8,12].

Choice of application of modern or Koryo therapy is reportedly based on doctors' knowledge and, pragmatically, on available resources. The expense associated with modern (bio)medicine can limit its use in clinical practice in DPR Korea [5]. Lim and colleagues provide examples from family medicine and Koryo medicine textbooks, published in Pyongyang, that example the teaching of combined use of western and Koryo treatments (herbal medicines, acupuncture, moxibustion, cupping) to enhance the effect, or decrease adverse effects, of modern 'western' pharmaceuticals. The textbooks also suggest dispensing certain Koryo medicines as alternatives to 'western' drugs such as antibiotics [5]. Research evidence on the outcomes of healthcare treatments in DPR Korea are not readily available – neither for modern, Koryo nor combined treatments – so knowledge about clinical outcomes in DPR Korea is scant.

4. Reasons for acceptance of traditional medicine

There are a number of influences that have promoted the high use of Koryo medicine in DPR Korea today: ideology; nationalism; economy and efficacy. For example: reaction against western medicine–including against its treatment rather than prevention-oriented approach; reaction against Japanese colonisation and attempted suppression of traditional Korean culture; general population acceptance of Koryo medicine; ready availability of traditional medicines during poor economic times and non-availability of pharmaceutical drugs; and effective treatment and belief in its efficacy–particularly for chronic conditions [5,12–14].

Koryo medicine is recognised by the government as culturally significant but also as effective at providing simple treatment methods and remedies (with fewer side-effects compared to biomedicine) that align with health promotion and disease prevention strategies [5,8,9,12]. Similarly, systems of traditional medicine have been embraced elsewhere as a symbol of resistance against colonising forces [15,16], and strong government support given at the close of periods of colonisation; for example, in the People's Republic of China [17], in India [18], and Vietnam [19].

In 1948, an important policy of DPR Korea's new government was "to combine Koryo medicine with conventional [medicine] in development *(sic)* of [a] national medicine" [20]. Over the ensuing decades the government has sought to strengthen Koryo medicine through research, practitioner education and training, and the adaptation of traditional treatment methods based on modern medical diagnosis [8]. In the 1960s and 1970s the existing workforce of modern medicine doctors received mandatory training on traditional medicine to "correct Western doctors' misunderstanding of traditional medicine, and encourage the combination of Eastern and Western medicines."[5] The drive to modernise and theoretically systematise Koryo medicine[8,21] was evident during field trips within Pyongyang (see Picture 2), but less obvious outside of the city limits where more traditional equipment was used and herbal medicines were displayed in abundance (see Picture 3). Box 2 summarises observations made during visits to three healthcare facilities in Pyongyang and one in a neighbouring county.

5. Global policy support for traditional medicine

For many years WHO has supported the integration of traditional medicine with national health systems towards its goal of 'health for

[2] 'Modern' or allopathic medicine seemed the preferred terms for biomedicine in DPR Korea. Some elements of Koryo medicine have been modernised – influenced by new knowledge and technologies. In this paper Koryo medicine is referred to as a medicine system distinct to modern 'biomedicine'.

Table 1
Selected public health statistics from a variety of countries including DPR Korea.

	Population total	Life expectancy at birth	Hospital bed density	Infant mortality	Underweight	GDP per capita
Country[a]	*Million*	*Years: Total population*	*No. beds/1000 population*	*No. deaths/1000 live births*	*% children < 5 years*	*2016 US dollars*
DPR Korea	**25.1**	**70.4**	**13.2 (2012)**	**22.9**	**15.2 (2012)**	**1700**
Mozambique	25.9	53.3	0.7 (2011)	67.9	15.6 (2011)	1200
Nepal	29.0	70.7	5.0 (2006)	28.9	30.1 (2014)	2500
Malaysia	30.9	75.0	1.9 (2012)	12.9	12.9 (2006)	27,200
Rep. of Korea	50.9	82.4	10.3 (2009)	3.0	0.6 (2011)	37,900
Vietnam	95.3	73.4	2.0 (2010)	17.8	12.1 (2013)	6400
Japan	126.7	85.0	13.7 (2009)	2.0	3.4 (2010)	38,900
Indonesia	258.3	72.7	0.9 (2012)	23.5	19.9 (2013)	11,700
India	1,266.9	68.5	0.7 (2011)	40.5	43.5 (2006)	6700
China	1,373.5	75.5	3.8 (2011)	12.2	3.4 (2010)	14,600

In columns 4 and 6, statistic is followed by (year of statistic). All other statistics are 2016 estimates. Statistics from the CIA World Factbook [3].

[a] Country selection is based on countries neighbouring DPR Korea, or countries with similar population to DPR Korea, and/or countries with high use of traditional medicine. Excludes countries currently experiencing war or post war conflict.

Picture 1. Equipment for providing Koryo medicine treatment including cupping and acupuncture, Ryongsan Ri country hospital, DPR Korea.

Picture 2. A doctor performing acupuncture in the Okryu Children's Hospital, Pyongyang, DPR Korea. Charts of meridian nerve points are on the walls, and equipment for cupping and acupuncture are ready for use on the desk.

Picture 3. Bags and boxes of herbal medicines piled high in Ryongsan Ri country hospital, DPR Korea. Chopping implements and a mortar and pestle were on a bench on the far side of the room.

all'[3] or 'universal health coverage'.[4] WHO recognise value in utilising traditional medicine practitioners whom, in some instances, provide primary healthcare services to address unmet health needs of popula-

[3] Following the 1978 *Declaration of Alma Ata*, the *Global Strategy for Health for All by the Year 2000* was unanimously adopted at the 34th World Health Assembly in 1981.

[4] The goal of universal health coverage is "to ensure that all people obtain the health services they need (prevention, promotion, treatment, rehabilitation, and palliation) without risk of financial ruin or impoverishment, now and in the future" [22].

tions, particularly in rural and remote areas in countries with otherwise few healthcare options [23]. The Beijing Declaration[5] acknowledges that traditional medicines, treatments and practices should be respected, preserved, promoted and communicated widely (as appropriate); that governments that have not yet taken steps to integrate traditional medicine into their national health system should do so; that traditional medicine should be further developed based on research and innovation; and that communication between conventional and traditional medicine providers should be strengthened [24]. Other declarations include the Bangkok Declaration on Traditional Medicine in ASEAN [25], and the 2013 Delhi Declaration, its implementation urged by the WHO Regional Committee for South-East Asia [26]. The goals of the *WHO Traditional Medicine Strategy 2014-2023* include harnessing the potential contribution of traditional and complementary medicine to health, wellness and people-centred health care; and the promotion of safe and effective use of traditional and complementary medicine by regulating, researching and integrating traditional and complementary medicine products, practitioners and practice into health systems, where appropriate [27]. It has been suggested that the *WHO Traditional Medicine Strategy 2014-2023* provides a roadmap for work on traditional and complementary medicine, particularly useful for engaging governments and linking to international initiatives [28].

6. Different ways of integrating traditional medicine

Just as health systems differ from country to country, how traditional or complementary medicine is integrated within those health systems differs widely [1,29–31]. Such integration can be conceptualised at the level of policy, service delivery and practice, and at consumer-levels [32]. Integration has also been conceptualised in other ways, for instance, by categorising different levels of official government recognition (policy frameworks) for traditional and complementary medicines within healthcare systems as integrative, inclusive or tolerant [33]. Another way of identifying integration of traditional and contemporary healthcare is by its level of fusion or separation with biomedicine, and level of discrimination found in general state practice − leading to conceptualisation of integration in terms of unification, equalisation, subjugation or marginalisation of traditional medicine relative to 'mainstream' modern medicine [30]. Below, integration within different countries are briefly compared to DPR Korea by highlighting their differences and similarities at policy, service-delivery and/or practice levels.

DPR Korea provides a strong example of integration at the state policy level, as well as at clinical practice and service delivery levels, where traditional and biomedical doctors can integrate the different approaches to medicine within their own practice, as well as working collaboratively with doctors of the other system of medicine; due to this, the system of integration in DPR Korea is relatively unique. There are many other, particularly Asian/Oriental, countries that also have strong government support of traditional medicine, for example (but not limited to), Bhutan, China, India, the Republic of Korea, Thailand, and Vietnam. However, a high level of integration and collaboration between traditional and biomedical practitioners, such as reported in DPR Korea, is relatively uncommon (but can occur).

Similar to DPR Korea, China[10] and Bhutan[34,35] are two of few countries that recognise their indigenous traditional medicine systems at a constitutional level, thereby providing, in a fundamental way, a level platform of equal recognition for biomedical and traditional medicine systems. The service-delivery frameworks of China and Bhutan, however, differ to DPR Korea. As outlined above, there are dual categories of doctor in DPR Korea, but structures and systems are established at all levels of service delivery for the provision of both traditional Koryo and modern medicine − with integration occurring at the practice-level through a single clinician combining both, or by collaboration between traditional Koryo and modern medicine doctors. The high levels of education of modern medical doctors in DPR Korea in Koryo medicine, and vice versa for Koryo medicine doctors, is a strategy adopted to harmonise practice to create a distinctly Korean medicine that combines both, and to make best use of available and limited resources [5]. This practice of Koryo medicine, as supported by the government, is not intended to adhere to tradition, rather focus is on its further development through modernisation, systematisation and "scientization" [21].

As contrast, in China today there are three categories of clinician: traditional medicine, western medicine, and those that combine traditional and western medicine. Despite the distinct categories it can be difficult to differentiate between the three 'types' of clinician at the practice-level. Medication pricing that enables greater profit to be made by prescribing western pharmaceuticals has reportedly contributed to many Chinese medicine practitioners primarily practising western medicine [10]. While political support and development of Chinese medicine in China has had a similar development trajectory to Koryo medicine in DPR Korea, in terms of unifying or harmonising and modernising practice (including practitioner education) [10,36,37], utilisation of Chinese medicine in China (10–20% [38]) is lower than the utilisation of Koryo medicine in DPR Korea (reportedly around 50% [8]), and use of Chinese medicine in China is reportedly in decline, particularly in urban areas [39].

In Bhutan, traditional medicine (known as gSo-ba Rig-pa) is co-located within departments of conventional medicine in hospitals and in clinics, administered by the same health department, traditional and western medicines are distributed through the same network, but there lacks formal mechanisms and encouragement of cross referral and collaboration [34,35]. In Bhutan, the two domains remain legally separated at the practice level, so 'integration' from patients' perspectives[32] is via patients separately consulting the different practitioners, usually for different aspects of their care.

Japan provides another example of clinician-level integration of traditional medicine and biomedical practice by a single practitioner, but in Japan this is not a dual system, as it is biomedical doctors who provide traditional medicine within the health service, not traditional medicine doctors. In Japan, traditional medicine makes up a small percentage of all treatments [40].

Integration of traditional medicine into the national health system in Cuba may have some commonality with DPR Korea. It was fuelled, particularly in the early 1990s, by need driven by trade sanctions affecting importation of pharmaceutical medicines [37,41]; DPR Korea is also affected by trade sanctions. Like DPR Korea, Cuban medical students also compulsorily study natural and traditional medicine, but they are not required to practise it. Like Japan, Cuba has a single system of medical doctors who have undertaken training in natural and traditional medicine. This education of doctors is considered to lead to "broad acceptance of NTM [natural and traditional medicine] as a legitimate medical science" [41].

In the Republic of Korea (South Korea), there is also a dual system of modern western and traditional Korean medicine [42]. The different social, political and economic paths taken since the dividing of the nation in 1945 have led to different systems of integration of traditional medicine at the regulatory, service delivery and practice levels [14]. In 1950, authorities came close to outlawing traditional medicine in the Republic of Korea, but the high reliance on traditional medicine practitioners in rural areas helped to defeat the bill [14]. Like DPR Korea, general population support for traditional Korean medicine in the Republic of Korea is said to be strong [43], yet unlike DPR Korea, tradi-

[5] The Beijing Declaration was adopted by the WHO Congress on Traditional Medicine, Beijing, China, 8 November 2008.

tional medicine now makes up just a small percentage of treatment (e.g. 4–5% of people receive treatment from a traditional medicine doctor) [11,44]. The Republic of Korea operates separate licensing systems for western and traditional medicine doctors with delineated practice boundaries between them − so unlike DPR Korea, integration does not occur at the practice-level unless treatment is received from one of the small (but growing) numbers of doctors who hold dual licenses to practice both western and traditional medicine [14,42,45]. Institutionalised conflict between the two medical disciplines does reportedly occur [5,14,42]. While a national medical insurance program has covered Korean traditional medical services since 1987, not all traditional medicine therapies are covered by the scheme (e.g. traditional decoctions of raw herbs are not covered, but proprietary herbal extracts that adhere to good manufacturing practice are covered) [11,16].

7. Integration and lessons from DPR Korea

Irrespective of political climate, two lessons can be gained from DPR Korea about integration of traditional medicine with national health systems. The first is the recognition of traditional or complementary medicine at a fundamental level of governance and/or law. As described above, DPR Korea (and China and Bhutan) provides constitutional-level recognition to traditional medicine and its practitioners. In theory, this not only facilitates government support for traditional medicine, including research, manufacture and education, but also equal standing and respect between the different provider types. While no observation was made during the visit to suggest that there was not equal standing between traditional and modern medicine practitioners, the practitioners themselves were not able to comment directly, so further investigation is needed to determine whether equal standing and respect are truly established in practice.

The second lesson is the mandatory integration of a substantial level of knowledge about traditional/complementary medicine diagnosis, practice and philosophy into the curriculums of biomedical students, and vice-versa for students of traditional/complementary medicine. This education policy is not unique to DPR Korea (e.g. medical curriculums in China similarly educate students to some degree in both modern and Chinese medicine), but it does ensure shared knowledge of different approaches to medicine and potentially enables greater collaboration, referral, and treatment innovation for the benefit of patients: i.e. taking the best approach to suit the presenting patient, their circumstances and available resources. There is suggestion that in DPR Korea, such integration and innovation can lead to lowered use of antibiotics, more effective public health promotion and disease prevention, the enhanced effectiveness of some biomedical pharmaceuticals, and fewer treatment adverse-effects for patients [5]. In these times of challenges to biomedicine and population health, such as presented by increasing antibiotic resistance and too few healthcare practitioners to serve population needs, greater levels of knowledge about integration of traditional or complementary medicine within national health systems is an avenue of opportunity that deserves research attention.

To date there has been limited health services and health outcomes research related to DPR Korea. There is also little research on models of traditional/complementary medicine integration more generally around the world. Far more needs to be known about best practices and the impacts of different models of integration on outcomes for the public [1,46–48]. While models of traditional medicine integration vary, they presumably do so to accommodate the many varied social, political and ideological contexts of different countries.

In multicultural countries, embracing an indigenous system of traditional medicine for a whole population is not necessarily appropriate. The largely homogenous ethnicity of populations in countries that have strong integration of traditional medicine (such as in DPR Korea, Republic of Korea, China, Bhutan) within their national health systems is likely a key factor to their success. That does not, however, preclude multicultural countries and those without strongly supported indigenous traditions of medicine from learning lessons about the provision and integration of traditional (or natural, alternative, complementary) medicines and applying them where appropriate, to improve health systems, access to care, and treatment outcomes.

8. Strengths and limitations

This paper provides insight into a little visited country; its purpose is to share personal observations and put some of those observations within a global context to increase knowledge and perspectives about traditional and/or complementary medicine integration with national healthcare systems. There are several limitations. This paper was not contemplated at the time of the visit to DPR Korea. The observations made would have been strengthened if this work was planned as part of a research study in which healthcare practitioners, policy-makers and consumers in DPR Korea had contributed − but gaining such approval and informed consent was beyond the objective of the visit, and conversations cannot be reported without consent. The observations and reflections about DPR Korea arelimited to what the author was shown, English-language documents provided within DPR Korea, peer reviewed and other grey literature. The reflections made relating to the visit to DPR Korea are entirely those of the author, as are any errors that might have been made by the author interpreting the surroundings and the information provided.

Conflict of interests

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