Global Shortage of Nurses

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Global Nursing Shortage: Impact & Solutions

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Globally speaking, health challenges are changing and becoming increasingly complex due to an ageing population with a chronic disease burden, such as cardiovascular, hypertension, diabetes and mental health conditions (Douglas, 2011, Both-Nwabuwe, 2019). Alongside these changes which place difficult demands upon healthcare systems around the world, effective workforce strategies that promote recruitment, retention and sustainability of qualified nurses are urgently needed to properly meet these increasing demands. Universal health coverage, achieving adequate population health standards and promoting equitable access to care depends upon the quality and quantity of a robust healthcare workforce.

Regulated nurses (RNs) work in collaboration with other members of an interprofessional team, providing health services to people of all ages, experiencing various forms of health challenges (CIHI, 2018). A health workforce must be of sufficient capacity to meet the population health needs, with world health leaders such as the World Health Organization (WHO) are predicting an increase in the global demand for both health and social care (Drennan, 2019). As half of the global healthcare workforce is compromised of nurses, nurses play a critical role in disease prevention and health by providing care in primary, community and hospital settings, including emergency and critical care areas (Drennan, 2019, WHO, 2019). However, in 2014, both the WHO and the World Bank calculated a current global nursing shortage of nine million nurses and midwives (Drennan, 2019, WHO 2019). The definition of a shortage varies between healthcare system but can be defined as a gap between the number of nurses required (demand) and the future number who are available to work (supply). The WHO and World Bank in particular, define a shortage in relation to the Sustainable Development Goals (SDGs), whereby a shortage means a lower than the required minimum number of doctors or nurses per head of population required to achieve the population health targets (Drennan, 2019). For example, half of the WHO member states report having less than 3 nursing and midwifery workers per 1000 population, with 25% reporting to have less than 1 personnel per 1000 population (WHO, 2019). The National Syndicate of Nursing Professionals (SNPI) has predicted a shortage of 18 million healthcare professionals by the year 2030, whereby half of the need are nurses.

Although a largely complex problem with many factors at play, in a nutshell, nursing shortages are primarily caused by the increasing and more complex demands for population health services coupled with a shrinking workforce, with more nurses retiring from the profession and others leaving the workforce altogether due to unhealthy work environments, characterized as being overly burdensome and stressful (Both-Nwabuwe, 2018).

Nursing shortages are experienced worldwide with the situation worsening in the future without policy interventions (Both-Nwabuwe, 2018). Healthcare organizations in the Organisation for Economic Co-operation and Development (OECD) countries, which includes Canada, Australia and the United Kingdom for instance, are all experiencing unstable nursing labour markets, characterized by extreme shortages and high turnover of staff (Currie, 2012). For OECD countries, there is a predicted shortage of 2.5 million nurses by the year 2030 (Scheffler, 2019).

The health system size, economy and characteristics of the population impact the entire healthcare system, including the types of healthcare professionals and distribution of the medical workforce to meet the needs of its population (Drennan, 2019). For example, the ratios of nurses to population based on data from 2017 range considerably from 17, 12 and 11: 1000 persons in countries of Norway, Germany and Australia, to 2 and 1 to 1000 persons in countries like China, India and South Africa (Drennan, 2019). In Belgium, the ratio is 9.51 nurses for 1000 population (OECD, 2016). According to the WHO, the largest needs-based shortages of both nurses and midwives are in South East Asia and Africa (Drennan, 2019).

Nursing workforce predictions vary substantially across different countries, even with similar levels of income and development (Buchan, 2015). National governments and their healthcare systems also have established their own minimum targets for workforce planning, such as high-income countries, who are members of the OECD. For OECD countries, only 5 of the 31 member countries have modelled demand and supply needs to the year 2025, Canada included. Of the five countries, four, including Australia, Canada, Ireland and the United Kingdom have all predicted shortages. The USA, being the fifth, have actually predicted a surplus of nurses by the year 2025 (Drennan, 2019). Other authors challenge the projected surplus of nurses in the United States, claiming the country will face a shortage of approximately 200,000 professionals by the year 2020 (Carnevale, 2015). Other francophone countries include Belgium, France and Switzerland for which Belgium is currently not projecting a future shortage of nurses (Rafferty, 2019). On the other hand, Switzerland is estimating a need for an additional 60,000 nurses by the year 2030, with most needs in primary and long-term care (Rafferty, 2019)

Understanding Demand Factors

The global nursing shortage is further challenged due to changing demographics such as the ageing population and a larger burden of chronic diseases, increasing health care needs and thus demands on healthcare services (Sasso, 2019). Although there has been substantial progress in reducing morbidity and mortality, and extending the life expectancy worldwide, there is a growing occurrence of non-fatal diseases and increasing amount of years lived with disability (YLD) (GBD, 2015). Changing demographic factors such as the aging of the world's population increased the amount of people living with diseases and injuries, increasing years lived with disability (YLD) (GBD, 2015). On a global scale, reports evaluating the global burden disease calculate disability-adjusted life year (DALY), which combines life lost due to mortality and years lived with a disability in a single measurement (GBD, 2015). One DALY is understood as a year lost of a healthy life. To understand the different diseases and how they impact morbidity and reduced functionality in life is important for understanding their impact on the demands of the healthcare system. The global burden of disease cited increases in YLDs due to mental and substance abuse disorders, neurological disorders, chronic respiratory diseases, musculoskeletal disorders and aging and population growth (GBD, 2015). For instance, in 2016, globally speaking, ischemic heart disease compromised 7.6% (or 2,730 per 100, 000 population) of DALYs, stroke; 5.2% or (1, 849 per 100,000 population), chronic obstructive pulmonary disease compromised 2.7% or (972 per 100,000 population), Diabetes Mellitus 2.5% of global DALYS or (880 per 100,000 population), trachea, bronchus or lung cancers, 1.5% or (551 per 100,000), depressive disorders (1.7% or 592 per 100,0000) (WHO, 2018). Communicable diseases that are listed in the leading

20 causes for DALYs include; lower respiratory infections (4.9%), diarrhoeal diseases (3.1%), HIV/AIDS (2.2%), Tuberculosis (TB) (1.9%) and neonatal sepsis and infections (1.5%) (WHO, 2018).

Progress made on a global scale is attributed to decreases in mortality from communicable diseases such as pneumonia and diarrhea, and other such as nutritional diseases and maternal outcomes (GBD, 2015). For instance, in the year 2000, the leading causes of global DALYs were lower respiratory infections (ranked first in 2000, ranking third in 2016) and diarrhoeal diseases (ranking third in 2000 and six in 2016). In targeting these health outcomes worldwide, there has been substantial progress made towards communicable diseases such as HIV/AIDS, TB, Malaria, Measles and Meningitis (WHO, 2018).

Simply put, higher income countries have increased burdens of more chronic communicable diseases, whereas lower or more middle income countries have increased burdens of communicable diseases, with trends also increasing towards non-communicable diseases as well in developing countries, creating a double burden. Over the past 50 years, lower and middle income countries are experiencing emerging epidemics of both chronic non-communicable diseases while still facing high prevalence of communicable diseases (Oni, 2015). Urbanization, changes in the rural economies, transnational diet changes, tobacco use are impacting lifestyle changes that increase risk for chronic non-communicable diseases, altering population health profiles around the world (Oni, 2015). For example, the burden of diabetes mellitus type II is expected to double by the year 2030 (Oni, 2015). These changing patterns are significant for healthcare planning as the understanding local risk factors and prevalence of diseases, whether communicable, non-communicable or both, will provide insight into comprehending a vital factor of healthcare planning, that is the demand or need for its services.

Understanding Supply Factors

The second necessary factor for healthcare planning is understanding the supply factor of the healthcare workforce. As with demand, supply factors will also vary extensively based on the region in question with political, economic, occupational and other social factors contributing to the scarcity of nurses (Carnevale, 2015). The economic environment of a country and the labour market will influence an individual's choice about their employment, including nurses, with income level being the most influential pull factor towards a profession (Drennan, 2019). Other influential factors also include; individual skills and interests, career plans, caring/family responsibilities and financial responsibilities. Job characteristics besides income that impact supply include other financial benefits (e.g. health insurance, pension), hours and pattern of working, type and volume of work, physical and/or emotional intensity of work, variety of work, team working, level of responsibility/autonomy, clinical and managerial support and professional support. Organizational such as clinical and employer reputation, type (e.g. private, public), size of organization, size of specialties within an organization, infrastructure to support employees (e.g. child care facilities, meal and social facilities), access to professional and career development activities and/or funding for these, also impact workforce supply. Lastly, location such as urban or rural, proximity to family and other services such as schools for children influence the labour market as well.

Cited reasons in the literature as to the factors causing the shortage in the healthcare profession are; insufficient number of nursing students completing their education, the ageing workforce and unhealthy work environments that promote both physical and mental stress,

causing turnover and nurses leaving the profession altogether (Sasso, 2019). Stressful work environments, characterized by long work hours, with the nature of the employment being both physically and mentally demanding are cited reasons for why many nurses leave the profession (Carnevale, 2015, CFNU, 2012, Douglas, 2011, RNAO, 2017, Shin, 2018). Conversely, well-developed educational programs, with professional development opportunities and clear career development pathways offered within a healthy work environment, in a larger context of a strong economy can make nursing an attractive profession (Carnevale, 2015).

Nurses in Canada
As with global trends, Canadians are living longer whereby the healthcare needs of the population are changing and becoming increasingly complex. For instance, by the year 2036, the CIHI has estimated that approximately 25% of the population will be of senior age (CIHI, 2018). The number of Canadian living with chronic diseases and multiple co-morbidities continues to increase due to aging of the population and due to advances in disease treatment and management (PHAC, 2016). In fact, one in three Canadians live with at least one of the following chronic diseases; cardiovascular disease, diabetes, cancer, chronic respiratory disease, mood and/or anxiety disorders (PHAC, 2018). As a result, there are longer hospital stays, an increase in required outpatient treatments and a higher demand for home care services and long-term care (CIHI, 2018). For example, for heart failure alone, there were approximately 420,000 hospital admissions between 2004 and 2013 in Canada (excluding Quebec), with a length of stay increasing from 7.5 days in 2004 to 8.3 days in 2013 (CIHI, 2018). Patient age also increased over time, and diabetes, chronic obstructive pulmonary disease and renal diseases were the most common comorbidities, the largest being diabetes among these patients admitted (Tran, 2016). Further to the increased complexity of the patient population, additional pressures on the systems such as rising costs, budget cuts and demands to increase productivity impact the future of the profession as these factors can influence future career choices and the retention of current working professionals (RNAO, 2017).

Nurse Workforce - Supply Factors

Statistics on the Canadian Nursing Profession
        From the Canadian Institute for Health Information (CIHI's) 2018 report, there was a total supply of regulated nurses of 431, 769 in the 2018 year, for which 303, 146 were RNs, 122,600 were LPNs and 6,023 were Registered Psychiatric Nurse RPNs (CIHI, 2018). Exit rates from the profession range from 2% per year for nurses aged 35-49 years old to 11% for nurses aged 60 or over (Tomblin, 2012). Based on Tomblin's stimulation model analysing demand and supply factors as described above, the authors predict a national shortage of up to 60,000 full-time nurses by the year 2022 (Forget, 2016, Tomblin, 2012). The 10-year trend in cumulative workforce growth from 2009 to 2018 in Quebec for RNs was 6% (The Quebec population growth rate was 7%) (Tomblin, 2012). What has been a major change is the growth rate of LPNs, with a 10 trend of 22.1% growth rate. In Canada, the inflow of nurses, referring to the number of registrants entering the profession was 7.4% from the years of 2014 to 2018. Outflow, referring

to the number of registrants leaving the profession was less, at 6.1%, for the same period (CIHI, 2018).

Education

Prior to entering the profession, a nurse must complete the required education and training. Supply factors for education including the training required, seats in educational programs, program attrition, program length, new graduates and graduate out-migration (Tomblin, 2012).

Of studying nurses in Canada, approximately 80% of graduates are able to earn their license following two years of finishing their studies (CIHI, 2018). Similarly, in France, completion rates of nursing education are similar, approximately 80% of students enrolled in the first year of studies obtain their diploma three years later (OECD, 2016). However, based on the stimulation model developed by Tomblin (2012), the authors show that about 28% of nursing students do not complete their training, this results in a loss rate in attrition in education programs (Tomblin, 2012). In Canada, there is an ongoing shortage of supply of nurses from the educational system. Due to budget cuts put in place in the 1990s, the number of registered nurses did not return to the pre-cut levels in 2003, however, due to the rising population, the amount of nurse graduates who obtain their license to practice is insufficient to meet the nurse-to-patient ratio as was three decades ago. If no changes are made, as predicted, 60,000 full-time equivalent positions will be short by the year 2022 (CFNU, 2012, Tomblin, 2012).

Foreign-Trained Nurses

Migration of both physicians and nurses is not a new phenomenon for which the percentage of foreign-trained health personnel ranges from almost none in countries such as Turkey, the Netherlands and Slovenia to more than 25% of the workforce in countries such as New Zealand, and between 10% to 20% in Switzerland, Australia and the United Kingdom. In France, foreign-trained nurses make up a small percentage of the workforce, only at 2.8% (OECD, 2017). In Canada, they make up 7.7% of the workforce. In 2018, there were 36,189 internationally educated nurses licensed to practice in Canada, this represents 8.5% of the country's nursing supply (CIHI, 2018). Countries such as Australia and Canada have increased the share of foreign-training nurses over the past ten years (2000 - 2015. Although small, in France, foreign-training nurses are also increasing, with many receiving their diploma from Belgium (OECD, 2017).

Skills Mix

The types of nurses also vary, as registered nurses' educational levels vary, with some countries requiring diplomas level versus university-trained nurses (Drennan, 2019). Depending on their education, the extent of their scope of practice will vary. Advanced practice nurses have expanded roles and assist with shortages and the maldistribution of doctors or other medical professionals (Drennan, 2019). Within Canada for example, there are three regulated nursing professions, each regulated provincially with its own governing body (CIHI, 2018). There are RNs, including nurse practitioners who work autonomously and in collaboration with an interprofessional health team with individuals at all stages of life, in a wide range of settings including clinical settings, education, administration, research and policy (CIHI, 2018). Nurse practitioners (NPs) have additional educational training and work with an expanded scope of practice that enables them to diagnose, order and interpret diagnostic tests (CIHI, 2018).

Licensed practical nurses (LPNs) can work autonomously or in collaboration with other members of the health care team as well, and assist in the assessment, implementation and evaluation of patient care. Lastly, registered psychiatric nurses are nurses who work in the field of mental health, such as mental illnesses and addictions (CIHI, 2018).

Nurse Assistants/Licensed Practical Nurses (LPNs)
Public health reforms and budgetary restrictions have also led to policies leading to a lower complement of higher skilled workers like professional nurses or RNs, in place for nurse assistants or LPNs to reduce costs (Aiken, 2016). In Canada, these trends are also occurring whereby the annual growth rate for regulated nurses from 2017 to 2018 was 1.0%, for which LPNs have the highest growth rate, a rate that is 4 times the RN rate (CIHI, 2018). Adding to the total nursing workforce, LPNs represent a two-third net gain in 2018. However, the annual growth rate has decreased over the last 5 years, down from 2.2% in 2014 (CIHI, 2018). In 2018, there was an inflow rate of 7.4% for nurses (registered nurses who had not been registered the year before). This inflow rate resulted in a net gain of 5, 817, whereby 61.8% of this were LPNs and RNs were 36.7% of the net gain.

The objective is to lower costs by mandating certain percentages of lower wage positions within the total nursing profession, without adversely affecting patient outcomes. However, evidence (Aiken, 2011, Needleman, 2019), has demonstrated otherwise. For instance, one Canadian study found that lower 30-day mortality rates were found among hospitals that had a higher percentage of RNs and a higher percentage of nurses trained at the university-level (Tourangeau, 2006). However, the trend of increasing lower skilled nursing positions with the staff mix is occurring in multiple countries. Within the hospital setting, nursing skill mix varies from 82% of the workforce in Germany being RNs to a low of only 57% in England and 54% in Spain (Aiken, 2016).

Income
The salary level of nurses is one of the most influential factors affecting job satisfaction and attractiveness to the profession (OECD, 2017). Another factor that influences the global shortage is that in most countries, the majority of nurses earn below the average wage of the country (Drennan, 2019). In higher income countries, however, the opposite is true. For example, in the United States, women make up 89% of the workforce and RNs are paid relatively better ($68,000) than other female-dominated professions such as secondary school teachers ($53,000) and primary school teachers ($50,000) (Carnevale, 2015). In most OECD countries, nurse salaries were above the average wage of all workers (OECD, 2017). In Luxembourg and Spain, the wage for a nurse were respectively, 38% and 28% greater than the average wage in the country (OECD, 2017). In Belgium, it is 10% higher than the national wage (Rafferty, 2019). Unfortunately, however, the trend within OECD countries has been a downturn in wages for nurses since the recession. For example, in Italy, wages were frozen and in Greece, remuneration was reduced substantially at 25% in real terms, between the years of 2009 to 2015 (OECD, 2017).

Gender
Globally, 70% of the health and social workforce are women, where nursing and midwives represent a significant share of the female workforce (WHO, 2019). In nursing specifically, 90%

are women and despite efforts to recruit men into the profession, less than 10% are male (Drennan, 2019). In the United States, efforts to recruit men into the profession has resulted in an increased from 9% in 2001 to 12% in 2015 (Buerhaus, 2017). In Canada, the supply of RNs who are male increased over the years of 2014 to 2018, growing by 17.7% (CIHI, 2018). In Belgium, males make up 13.2% of the nursing profession (Rafferety, 2019).

Another important cohort of the nursing workforce are nurses who are parents and/or have home and family commitments (Currie, 2012). Having young children for instance is a strong predictor in a reduced participation rate in the workforce, where family commitments were responsible for 44% of nurses leaving the profession (Currie, 2012). In a predominantly female-dominated profession, this is a significant factor impacting the nursing labour market (Currie, 2012).

Age of the Nursing Workforce
Another key factor to consider with workforce planning is to acknowledge the age of nurses. In Canada for instance, the age of nurses aged 60 or older made up 11.2% of the workforce, nurses aged 40 to 59 made up 45.2% of the workforce and nurses aged 39 or younger made up 43.6% of the workforce (CIHI, 2018). The average age of RNs in 2018 was 44 years old (CIHI, 2018). The number RNs aged 55 or older decreased between the years of 2014 and 2018. In 2017, there was outflow rate of 6.1% (that is regulated nurses who did not renew their registration in their province) (CIHI, 2018). From 2000, the percentage of nurses aged 55 and over was approximately 10%, now that has increased to just under 30%, indicating a large future wave of retirement to occur in the Canadian workforce (Forget, 2016).

Nursing is an ageing and female dominated workforce, the average age of nurses in Denmark, Finland, Ireland, New Zealand, Sweden, the USA, and the UK, ranges from 42 to 47 years of age, where in the US, approximately 40% of the nursing workforce are over the age of 50 years (Goodare, 2017).

Impacts of Nursing Shortages
Despite the various factors contributing towards the nursing shortage, it is also well known that working with unsafe nurse-patient ratios and chronic understaffing on clinical units negatively impact patient outcomes and contribute towards multiple poor outcomes among staff as well (Sasso, 2019).

Impacts on Patients
The nursing profession is present twenty four hours a day, seven days a week, 365 days a year for which they are in the best position to detect changes in patient statuses, intervene early, and catch errors that can all lead to adverse outcomes (Twigg, 2015). To better understand nursing impacts on care, the term nurse-sensitive outcomes (NSO) have been developed. NSO's are variables in a patient state, behaviour or perception that are responsive to nursing interventions (Twigg, 2015). These variables are dependent upon both the quantity (staffing, nurse-patient ratios) and quality of care (education level, age, nursing experience) (Twigg, 2015). The relationship between nurse staffing levels and health outcomes for both the professionals and who they care for, have been well-studied (Aiken, 2016, Needleman, 2019) . What has been

well demonstrated is that higher staff levels are strongly associated with decreased adverse patient outcomes (Aiken, 2012, Kalisch, 2012, Staggs, 2012, Twiggs, 2015, Needleman, 2019). Adverse patient outcomes include re-admission, falls, failure to rescue, length of stay, medication errors, patient satisfaction and mortality (CFNU, 2012).

Adverse Patient Outcomes
In Twigg's (2015) study (n=36,529 patients) demonstrated that understaffing had significant impacts on the prevalence of; surgical wound infection, urinary tract infection, pressure injury, pneumonia, deep vein thrombosis, upper gastrointestinal bleed, sepsis and physiological metabolic derangements. In Stalper's systematic review (2015), the authors find significant effects of a health work environment, characterized by nurse-physician collaboration along with a strong skills mix, that is more experienced and higher-educated staff were significantly associated with decreased rates of pressure injuries and patient falls (Stalper, 2015). Many other studies also demonstrate similar findings; higher nurse staffing levels decreased hospital-acquired infections (Manojilovich, 2011), patient falls (Patrician, 2011), decreased occurrences of failure to rescue (Shever, 2011), due to increased nursing assessments, decreased length of (Kane, 2007). In Canada, the average length of hospital stay is ranges from $ 4,100 to $ 11, 400, depending on the speciality, for the year 2017 (CIHI, 2017).

Patient Mortality
In Needleman's (2019) study, (n= 133, 742 unit shifts) the authors analyze shifts with low RN staffing (below typical or targeting staffing) and low nursing support staff were associated with increased patient mortality (Needleman, 2019). Similarly, in Aiken's study (2016), the authors find that a richer skills mix, that is, an increase in percentage of professional nurses among all other types of personnel were associated with lower odds of mortality in adult acute care hospitals in Belgium, England, Finland, Ireland, Spain and Switzerland (Aiken, 2016). The authors add that even just substituting one nurse assistant for a professional nurse for every 25 patients was associated with a 21% increase in the odds of mortality (Aiken, 2016).
Along with having a richer skill mix on clinical unit, reducing patient workloads for nurses decreases patient mortality. For instance, one study showed that for every surgical patient added to a nurse's workload, the odds of a patient dying under the nurse's care increased by 7% (CFNU, 2012).

Impacts on Nurses
Short-staffing compromises patient care and also impact's nurses' well-being, leading to adverse outcomes such as burnout, increased stress, workplace violence, intention to leave, abseentism, job dissatisfaction and leaving their position, or the professional altogether (Douglas, 2011, RNAO, 2017, Shin, 2018). As with adverse patient outcomes, there have been many studies conducted showing that lower nurse staffing and dissatisfaction with working conditions are with burnout, job dissatisfaction, turnover and abseentism (Aiken, 2012, CFNU, 2012). Nurse burnout is the physical and emotional state of chronic overwork and the lack of job fulfillment and support (Chan, 2013). Burnout manifests as exhaustion, cynicism and low sense of personal success (CFNU, 2012). Job dissatisfaction refers to the lack of positive feelings or response to one's work conditions (CFNU, 2012). Nursing burnout and job dissatisfaction have been correlated with

overburdened patient workloads, lack of input or little involvement in decision making in regard to patient care or their own assignment, including flexibility in schedule and work shifts (CFNU, 2012). These outcomes however are rooted in excessive workloads and insufficient staffing (CFNU, 2012). Similarly, workplace violence includes physical and verbal abuse from patients, other staff members or from one's supervisor or those in management positions (CFNU, 2017b, CNA, 2019). The leading risk factor for workplace violence is inadequate staffing levels and supervision, contributing to stress. The presence of workplace violence is associated with intention to leave and turnover rates (RNAO, 2017)

In Shin's meta-analysis, higher nurse-to-patient ratios were consistently associated with adverse outcomes for nurses, when one was added to a nurse's care assignment, it increased the odds of burnout by 7%, of being dissatisfied by 8% and increased the intention to leave 1.05 times (Shin, 2018). Aiken's study showed higher rates; for each additional patient, there was a 23% increase in burnout and a 15% increase in job dissatisfaction (Aiken, 2012). When nurses confront inadequate staffing, and the resulting stress, they leave their positions (Hairr, 2014). Prior to leaving their positions or the profession altogether, another phenomenon is increased abseentism. It is well known that nursing has a higher rate of abseentism compared to other profession, nearly twice the rate and higher than all other healthcare personnel (CFNU, 2012). The cost of abseentism (due to own illness or disability) to the Canadian healthcare system was estimated to be $989 million in the year 2010 (CFNU, 2017a). Predictors of job abseentism included burnout and work-related stress (Davey, 2009).

Intention to Leave
Intention to leave is related directly to a nurse's job satisfaction (Chan, 2013). Other cited factors include high levels of stress and burnout and low commitment are factors associated with intention to leave the nursing profession (Drennan, 2019). Job satisfaction, the primary factor influencing intention to leave is determined by; income, career advancement, opportunity, workload, stress and satisfaction with management and the organization (Chan, 2013).
In one study conducted in Switzerland, the authors found 28% of participating nurses reported an intention to leave within the next twelve months due to dissatisfaction, 24% of those reported an intention to leave the nursing profession altogether (Rafferty, 2019). The intention to leave ranged in other European countries; 19% in Netherlands, 26% in Germany and 49% in Finland (Rafferty, 2019). Other cited reasons associated with intention to leave relate to a poor work environment including; lack of resources, staff shortages, lack of autonomy, lack of professional development opportunities (Chan, 2013).

Turnover
Turnover is the rate at which an organization loses its employees and is also determined by how long an employee stays in their position (Currie, 2012). Job satisfaction is the primary indicator influencing the likelihood an individual will remain with their job and is therefore the most significant factor in turnover (CFNU, 2012, Hairr, 2014). Turnover continues to impact the healthcare system. In Canada, one in five hospital nurses will leave their job every year (CFNU, 2012). Using Canadian data from 2005 to 2008, there was an exit rate from the nursing profession averaging 13%, for RNs under the age of 30 (Chachula, 2015). In the United States, England and Japan, turnover rates are between 10% to 20% (Forget, 2016). Turnover for an organization is

fiscally expensive, estimated to be between $42,000 for a medical-surgical nurse up to $80,000 for a speciality nurse (Hairr, 2014, Tellez, 2012). American studies show the cost of turnover is even higher with the cost to the hospital for each nurse that leaves is estimated to be between $82,000 to $88,000 (Forget, 2016). In Canada, the cost of turnover for one nurse position is approximately $25,000, higher for specialized nurses, as high as $67, 100 (CFNU, 2012). The costs of replacing a nurse come from recruitment, replacement costs during vacation, hiring, orientation, decreased productivity, potential errors, loss of organizational knowledge and additional turnover (CFNU, 2012).

New Nurses

Turnover rates among new nurses is often even worse. In France, 30% of newly registered nurses leave the profession in the first 5 years after receiving their diploma (SNPI, 2019b). In Quebec, 43% reported experiencing a high level of distress, with the study revealing that 62% of participants intended to quit their current employment as a result, with 13% intending to leave the profession all together (Lavoie-Tremblay, 2008). In New Zealand, 30% of new graduates leave the profession. In Australia, 20% of new graduates will leave within the first year of employment. The Nurse's Early Exit Study (NEXT), a large study conducted across the European Union found that 9.3% of new nurses left the profession, ranging from 4% in Italy to 14.6% in Germany (Chacula, 2015). These findings demonstrate an international trend in turnover for new nurses in nursing profession, further impacting predicted shortages.

Future Solutions

There are growing concerns, globally and within OECD countries about the possible future shortages of nurses, given the demand for their services will rise in the context of population ageing and the upcoming retirement of the 'baby boomer' generation of nurses (OECD, 2017). With over two decades of national and international research consistently demonstrating a clear relationship between inadequate nursing staffing and poor patient outcomes, such as increased mortality rates, failure to rescue and increased hospital stays. Inadequate staffing also poorly impacts the nurses themselves, putting them at risk for stress and being overburdened, leading to high rates of turnover in the profession (CFNU, 2012). The findings are undeniable and now, there must be action to address these nursing concerns to improve patient care and the quality of the healthcare systems.

Despite the plethora of research demonstrating the very conclusive correlation between nursing staffing levels and their impact on both patient outcomes and on nurses themselves, including their retention, unfortunately, the public system has reduced the number of nurses. The health care system has the potential to reduce their budget in the short-term by cutting nursing positions as they make up the largest health professional (Hairr, 2014). Nurses salaries represent 25% of a hospital's operational budget and approximately 40% patient care costs (Forget, 2016). It is picking the 'low hanging fruit' in terms of short-term solutions to the budget restrictions, yet these changes are only serving to exacerbate the fundamental problems.

Therefore, the public system is either unwilling or unable to provide appropriate nurse staffing levels that are well supported by the literature (Hairr, 2014). This underfinancing of the nursing profession creates a shortage itself, which only serves to create a vicious cycle of impeding healthy workplace environments, for which staffing levels are a vital factor. This chronic

understaffing therefore promotes unhealthy work environments characterized by high workload burdens on nurses, impacting turnover in the profession, further creating shortages. Clearly, salary expenses will increase if the quota for nurses is increased, however the long-term savings will be indirect and transpire in the form of nurse retention and improved patient outcomes (Hairr, 2014).

The WHO advocated for investment in policy to support and sustain the nursing workforce in the health care system by targeting both supply and demand factors (Drennan, 2019). The OECD 2016 report on the state of the health workforce also underlines the need to employ strategies that lead to the retention of nurses in the profession and to take action on preventing their leave from the profession (OECD, 2016, Forget, 2016). Investment into promoting nursing retention is a recommended essential strategy to reducing the projected nursing shortages (Tomblin, 2012). Unhealthy work environments, poor working conditions coupled with a lack of available staff are mutually reinforcing towards the nursing shortage (Debra, 2007). Therefore, addressing workplace environment factor such as implementing strategies to reduce job strain and overload, improving leadership support, reducing the physical demands of the job are efforts that have been shown to improve health and reduce abseentism (Tomblin, 2012). As with other strategies to reduce turnover in the nursing profession, implementing appropriate nurse staffing levels is an essential managerial effort towards improving retention in staff (Shin, 2018).

Fiscal Commitment

The financial commitment that a country spends to its health care sector varies and changes overtime and is influenced by wider social and economic factors (OECD, 2017). Public budgets priorities will change year to year and will change as a result of political decision making. In the majority of OECD countries, government programs and compulsory health insurance compromise the main health care financial spending, accounting for almost three-quarters of all healthcare spending in 2015 (OCED, 2017). In Germany, France and Japan for instance, more than 75% of all healthcare spending was paid through government health insurance programs (OECD, 2017). The United States spent USD 9 892 per resident, which is about two-and-a-half times the average of the 35 OECD countries. The highest per capita countries include Switzerland ($ 7 919), Luxembourg ($ 7 463), and Norway ($ 6 447). Canada spent $ 4 753 per capita and France spent $ 4 600 per capita in 2016 (OECD, 2017). For Canada, this represented approximately 10.6% of the national gross domestic product (GDP) and for France, it represented 11% GDP. Belgium comparably also has high health expenditure, at approximately 10% of GDP while Switzerland pends 12.4% of its GDP on health (Rafferety, 2019). The lowest per capita spenders on health in OECD countries were Mexico and Turkey at similar to spending in more developing economies such as the Russian Federation, South Africa and Brazil (OECD, 2017).

Health expenditure for different types of services also vary, such as inpatient and outpatient care, medical goods such as pharmaceuticals and equipment and long-term care services and efforts in prevention and health promotion (OECD, 2017). For example, in France, Poland and Austria, in-patient spending makes up more than a third of total spending (OECD, 2017). The Canadian spending per capital in health expenditure was increasingly steadily from the period of 2003 to 2009 at an average of 3.1%, however from 2009-2016, the expenditure growth rate has decreased, averaging only 1.1% (OECD, 2017). This reflects the trend in many

OECD countries, following the economic crisis in 2008 (OECD, 2017). Unfortunately, the impact of the decreased fiscal commitment to healthcare expenditure took form of reducing wages in public hospitals, cutting healthcare positions, postponing staff replacement and delayed investments in infrastructure, measures all taken to reduce healthcare budgets. In making budget decisions, policy-makers need to assess both short-term costs, but also the long-term impact in the medium and long-term. In Canada, hospital care costs approximately $66 billion a year, whereby staff salaries make up the largest component at 71%, and with drugs and medical supplies for instance only compromising less than 10% (CIHI, 2017). As nurses make up the largest amount of healthcare workers within the system, cutting nurse's positions is often a short-term solution taking by policy makers to cut spending.

Improving Nurse Workloads
First and foremost, improving nurse retention and planning for future nurse shortages will require effective human resource planning (Douglas, 2011, ICN, 2018). As per the Canadian Federation of Nurses Union, addressing workload is the number one concern for nurses today (CFNU, 2012). Questions surrounding the optimal number of nursing personnel in order meet patient needs is an ongoing debate. Rather than determining the 'right number', it is about aligning the right caregivers and resources with the needs of a patient, which vary substantially according to their health history, required interventions and required clinical expertise (RNAO, 2017).

Increasing RN numbers has been a common strategy taken by various countries such as the United Kingdom and Ireland (Attree, 2011). Due to the strong evidence studying the importance of healthy work environments and nurse retention, several countries including the United States, have legislated staffing policies for nurses that include mandated nurse-to-patient ratios (Shin, 2018). In California, the mandated nurse-patient ratio is 1:4 (CFNU, 2012). In Belgium, there are also set minimum nurse staffing ratios per speciality, for instance, for 30 surgical-medical beds, there is a minimum requirement of 12 full-time equivalent care personnel (Rafferety, 2019). Additional financial resources are available if nursing care intensity for medicine, surgical, pediatric and intensive care units are above the national benchmark, this is a unique feature of the Belgian hospital financing system for nursing (Rafferty, 2019). In 2008, the Belgian government committed to reducing nurses' workload stress and created 400 more positions to strengthen the workforce and replace absent staff (Rafferty, 2019). In Australia as well, nurse ratios are achieved based on a formula of minimum nursing hours per patient day, generally resulting in equivalent of 1:4 on day shifts (CFNU, 2012). Research findings from these implemented ratios are as expected, increased nurses reduce adverse patient outcomes such as pressure injuries and length of stay, to name only a few (CFNU, 2012). Also, there was an increase in job satisfaction, the number one factor that influences intention to leave (CFNU, 2012). These efforts improve patient care and lead to retention in the profession.

However, other countries, such as Switzerland have never defined or made compulsory nurse-to-patient ratios or staffing levels required for hospitals (Rafferty, 2019). The average patient to professional nurse ratio in Swiss hospitals (across all shifts) was 7.9, where it was 5.4 in Norway, 10.2 in Greece and 13 in Germany. For all European countries, the average of patient-to-all-nursing staff was 5, with the lowest ratio being 3.3 in Norway (Rafferty, 2019). Despite the

variability, there is argument that improved staffing levels alongside a healthy work environment results in more satisfied patients and nurses with evidence of improved patient care (Rafferty, 2019, Aiken, 2012).

Determining optimal staffing requirements is a complex issue, with varying strategies being implemented in different countries. However, the ICN states that at all times, nurse leaders, should be able to control and adjust nurse staffing levels to ensure patient safety. If nurse staffing is inadequate, adjustments should be made to the system (ICN, 2018). In addition, the utilization of valid and reliable planning tools, evidence-based staffing and robust review processes are needed to inform required staffing and enable nursing care to provide their care safely (ICN, 2018). In addition to poor patient outcomes, inadequate staffing impacts nurses' wellbeing and can lead to lower job satisfaction, higher levels of stress, burnout and intention to leave and turnover in the profession (ICN, 2018).

Education and Advanced Practice Roles
There has been emphasis on achieving higher levels of education and training of nurses to address future challenges in the healthcare system (Douglas, 2011).
Along with implementing university-level requirements for entry into the profession, other efforts have included developing and implementing more advanced roles for nurses. Advanced clinical roles must be supported by setting clear roles in the healthcare settings. These roles empower the profession to expand their scope of practice (Douglas, 2011). An example of advanced nursing role are nurse practitioners which have been introduced in countries such as the United States, Canada and the United Kingdom. The nurse practitioner's role is to improve access to services, reduce waiting times with an expanded role to effectively respond to minor illnesses (OECD, 2017). Other countries such as France and Switzerland do not yet have formalized advanced nurse practice roles however their definition and support appears to be emerging (Jovic, 2015, Rafferty, 2019). This variation may be due to how care is delivered, with Belgium and France delivering primary care mainly by medical doctors whereas Canada, Australia, United States and UK use clinical practice teams (Jovic, 2015).

Recruitment
Increasing the future supply of nurses will require coordination with educational sectors on behalf of the public government. This strategy has been adopted in various European countries such as Denmark, Finland, Ireland and the United Kingdom (Attree, 2011). Simply increasing the number of student numbers is far more complex as the capacity an education system has for its nursing programs will limit applicants and acceptance of new students, costs of education, nurse salaries and public image and attractiveness of the profession all influence prospective students (Attree, 2011). Another strategy undertaken by many industrialized countries, including Canada, has been recruiting internationally trained nurses (Kwok, 2016). According to the CIHI, 7.7% of Canadian nurses are foreign-trained (Kwok, 2016). Mostly, recruitment strategies will fail if the current nurses do not stay in the profession due to workplace stress, burnout and job dissatisfaction (Attree, 2011).

The Key to Retention: Healthy Practice Environments

Promoting healthy and safe conditions, with adequate staffing, is a key strategy for promoting job satisfaction, reducing stress and burnout and thus promoting retention (Attree, 2011). Improvements in work conditions are urgently required to retain nurses (Attree, 2011). Healthy practice environments involve many factors and include more efforts than increasing staffing. Professional autonomy, teamwork, the ability to influence decision-making, authentic leadership practices and professional development opportunities are all cited as characteristics of a healthy workplace (Attree, 2011). In countries such as Finland, Portugal and the United Kingdom, in effort to improve nurses' working lives, flexible working hours and self-scheduling were introduced (Attree, 2011).

Factors of a Healthy Work Environment

A healthy work environment is defined as 'one in which leaders provide the structures, practices and policies that enable clinical nurses to engage in the work processes and relationships essential to safe and quality patient care outcomes' (Stalpers, 2015, p. 818). In the literature and with nursing practice, there is a strong emphasis on working towards establishing healthy work environments to prevent aggravating nursing shortages and to promote the well-being of the profession (Shin, 2018). When discussing nursing staffing, it is often measured by the staffing level and the skill mix (Hairr, 2014). Staffing level refers to the total number of nurses or care hours per patient volume such as a nurse's workload, patient ratio or number of beds. In regard to the professional mix within the staff itself, this refers to the number of RNs, LPNs and other forms of nurse assistants or nurse aids (Shin, 2018). As the International Council of Nurses has highlighted, the solution is not simply increasing the number of nurses, but also considering the different types of nurses within the workforce, including the specialists who play an essential role in providing care of the highest quality, in supporting the team and guiding new nurses into the professional workforce (ICN, 2019).

Expanding further on employment characteristics of nursing, it is well known that nursing is a demanding profession, both physically and emotionally. Nurses work a disproportionate amount of paid and unpaid overtime, are in work environments that can be violent where they are threatened by injury and other assault, are overworked and as a result have high rates of injury and illness (Debra, 2007). The nursing profession also has one of the highest rates of abseentism compared to other professions, with nurses missing an average of 14 work days, twice the national average (Tomblin, 2012). Unhealthy workplace environments result in poor retention and recruitment into the profession (Debra, 2007). Experts are pleading for governments to take action urgently, or else these unhealthy work environments, with burdensome patient ratios will only serve to risk losing more and more nurses (SNPI, 2019a). Conversely, a healthy work environment is a setting that maximizes the well-being and health of its staff by ensuring organizational performance that leads to the best possible outcomes for patients, their families and the community. A healthy work place environment is based on evidence-based staffing and appropriate workloads that are implemented to benefit both patients and the healthcare providers (RNAO, 2017). Organizational budgets must be appropriate to staff sufficient nurses to achieve intended positive health outcomes for patients and families (RNAO, 2017). There is strong evidence demonstrating that healthy workplace environments

create positive financial benefits to the organizations as it reduces abseentism, lost productivity and costs arising from adverse outcomes (RNAO, 2009). Unhealthy work environments are cited as a reason for current shortages, creating future challenges for the profession in terms of recruitment and retention (RNAO, 2009).

Call for Action by Nurse Leaders
Many international health leaders and nursing bodies and institutions, both globally speaking and nationally have called for the implementation and sustenance of healthy workplace environments (AACN, 2019, CCHSA, 2017, CFNU, 2012, ICN, 2018, RNAO, 2017).
The AACNs have presented six, evidence-based standards for a health work environment. These six standards produce effective and sustainable positive outcomes for both patients and nurses (AACN, 2019). These six standards are; skilled communication, true collaboration, effective decision making, appropriate staffing, meaningful recognition and authentic leadership. The RNAO has also published extensively on the creation of healthy workplace environments, they organize their recommendations into the following;

Organizational Recommendations/Organizational Support (RNAO, 2017)
- Organizations must develop a workforce plan to ensure staffing that allows for the delivery of safe and competent care that yields positive patient outcomes.
- The board, administrative leadership and human resources must work together to ensure sufficient point-of-care nurses or bed-side nurses in appropriate categories to provide safe and quality patient care. *(Appropriate Staffing)*
- Organizations must arrange their budgets to ensure sufficient nurses in appropriate categories. *(Appropriate Staffing)*
- Organizations utilize reliable and valid tools to determine patient needs and workloads that inform required personnel in each category. *(Effective Decision Making)*
- Organizations that provide access to resources, support, information and professional opportunities are empowering structures within an organization for an employee (Chan, 2013).
- Nursing is an evolving profession and organizations should support continuous learning opportunities. These can take form of; formal academic programs, short-term continuing education activities, certification programs, independent learning and committee participation. Organizational support for professional development takes form of offering protective time or compensated initiatives, all aimed to improve the capacity of the nursing staff. These efforts contribute towards retention and job satisfaction (Kwok, 2016).

As previously iterated, poor organizational support leads to deteriorating work environments, with a lack of human and informational resources, staff shortages, lack of autonomy in practice and a lack of professional development opportunities. These factors are associated with intention to leave (Chan, 2013).

Individual Recommendations (RNAO, 2017)
- Nurses participate in staff decision making at the strategic, operational and day-to-day levels, evoking principles of shared governance *(True Collaboration)*
- Nurses, including those in charge, are responsible for day-to-day staffing decisions demonstrate team skills and knowledge and support a comprehensive approach to staffing including possessing knowledge of patient needs, the team, understanding individual skill levels, communication skills, scope of practices, flexibility and a strong understanding of the organization.
  - Leadership Team: Leaders practice transformational leadership; leaders work in a team to create a vision, executing this vision together. Transformational leaders enhance motivation, morale and job performance by being a role-model, share ownership and align with followers. Transformational leaders make significant contributions to their organizations by possessing a positive vision and being truly collaborative with their teams (RNAO, 2017). *(Authentic Leadership)*
  - Employers have a strong role in influencing workplace culture and must take an assertive stance and preventative role towards incidents of violence in their workplaces. Leaders can ensure support programs are in place to promote the safety and well-being of nurses and other professionals (CFNU, 2017b, CNA, 2019).

Conversely, a management style characterized as non-transformational leadership or having a laissez-faire approach where the manager is disengaged, sets unrealistic expectations, is unable ability to solve problems, lacks professionalism whereby the staff have negative perceptions of supervisor support and innovation, are factors associated with intention to leave (Daouk, 2014).

Government Recommendations (RNAO, 2017)
- Governments to commit to providing financial resources and leadership personnel who specifically embark to create healthy work environments that support safe staffing practices and that promote nurse retention and contribute to positive patient outcomes.

Research Recommendations (RNAO, 2017)
- Support nurse researchers to continue to study the impact and outcomes of staffing on nurses, patients, organizations and systems.

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