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Research Article

12-hour Shifts for Radiation Therapists

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Tom Farrell, PhD, FCCPM^b and Ho Emily (Po-Hui), MRT(T), RTT, BMRSc^b^a *McMaster University, Hamilton, Ontario, Canada*^b *Juravinski Cancer Centre, Hamilton, Ontario, Canada***ABSTRACT**

In Canada, Radiation Therapy program hours have ranged between 8 and 10 hours a day. Some centres have an option of a 4-day, 10-hour-day workweek. In 2012, Cancer Care Ontario released their Radiation Treatment Capital Investment Strategy. In this, they mandated that in order to maximize the use of current infrastructure, cancer centres will need to be operational for 12 hours in the future. This strategy was supported by a cost-benefit analysis. Currently, Ontario Radiation Therapy managers are developing a 12-hour staffing model. The objective of this study was to determine radiation therapists' (RTs) perceptions on 12-hour shifts. A survey, both quantitative and qualitative, was developed based on a comprehensive review of the current literature. The survey was distributed to 126 RTs at the Juravinski Cancer Centre and the Walker Family Cancer Centre. There were 48 respondents to the survey. Data were analyzed using the Sign Test and Kruskal-Wallis test to determine the difference from the null hypothesis (neutral). The results revealed that RTs have a neutral interest in working 12-hour shifts and that there is a greater number of recognized disadvantages and concerns associated with 12-hour shifts than benefits. Although the extra days off are desired, burnout, scheduling, poor quality of life outside of work, and the challenges with operating such a system with multiple departments seem to have a greater impact on the opinions of RTs. In conclusion, further research on staffing models, the incorporation of other departments, and an arrangement of sufficient breaks to prevent fatigue are needed to make 12-hour shifts a more attractive and feasible option to RTs.

RÉSUMÉ

Au Canada, les programmes de radiothérapie fonctionnent entre huit et dix heures par jour. Certains centres offrent en option la semaine de quatre jours de dix heures. En 2012, Action Cancer Ontario a publié sa stratégie d'immobilisation en radiothérapie (Radiation Treatment Capital Investment Strategy), dans laquelle elle déterminait que pour optimiser l'utilisation des infrastructures actuelles, les centres de cancérologie devraient être opérationnels pendant 12 heures par jour à l'avenir. Les gestionnaires de radiothérapie en Ontario ont entrepris d'élaborer des modèles de dotation sur 12 heures. L'objectif de la présente étude était de déterminer les perceptions des radiothérapeutes face aux quarts de travail de 12 heures. Un sondage à la fois quantitatif et qualitatif a été préparé à partir d'une étude documentaire approfondie. Le sondage a été distribué à 126 radiothérapeutes dans deux centres de traitement (Juravinski Cancer Centre et Walker Family Cancer Centre). Les 48 réponses reçues ont été analysées au moyen du test de signe et du test de Kruskal-Wallis afin d'établir la différence avec l'hypothèse nulle (neutre). Les résultats démontrent que les radiothérapeutes ont un intérêt neutre envers des quarts de travail de 12 heures et que le nombre d'inconvénients et de préoccupations reconnus associés aux quarts de travail de 12 heures dépasse celui des avantages. Bien que les journées de repos supplémentaires soient souhaitées, l'épuisement professionnel, l'établissement des horaires, la faible qualité de la vie hors professionnelle et les défis de fonctionnement d'un tel système dans des services multiples semblent avoir une plus grande incidence sur l'opinion des radiothérapeutes. En conclusion, d'autres recherches sur les modèles de dotation, l'intégration d'autres services et l'organisation d'un nombre suffisant de pauses pour prévenir la fatigue sont nécessaires pour faire des quarts de travail de 12 heures une option plus attrayante et réalisable pour les radiothérapeutes.

Keywords: Radiation therapist; shift scheduling; working shifts; compressed workweek

Introduction

In April 2012, Cancer Care Ontario (CCO) released their Radiation Treatment Capital Investment Strategy to ensure investments meet treatment program goals and contribute to the quality of patient care [1]. It addresses radiation treatment demand to the year 2020. There is currently limited literature on

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radiation therapists (RTs) working 12-hour shifts. Most literature address the effects of nurses working 12-hour shifts with themes surrounding minor bodily ailments, depersonalization, low personal accomplishment, fatigue and burnout, quality of care, inter-shift recovery, patient safety, job dissatisfaction, and intention to leave [2–6]. The objective of this study was to determine RTs' perceptions on 12-hour shifts since CCO included 12-hour operation as part of their strategy.

The strategy commented on investments in new treatment equipment and facilities, minimizing costs, and maximizing the use of current equipment and infrastructure. Previous investment strategies focused mainly on investments in new treatment facilities, and this largely helped close the gap between treatment demands and capacity in Ontario, resulting in shorter wait times [1]. That being said, the proportion of cancer patients who receive at least one course of radiation in their life is lower in Ontario compared with international rates and CCO's goals, although there was an improved access for patients [1]. Since CCO projected that there is enough current infrastructure to meet demands for treatment, immediate priorities focused on maximizing the use of the current capital and improving utilization rates [1]. To project treatment demand and required capacity, all aspects of current practice were updated to reflect the best use of existing infrastructure. Included in this assessment was the number of hours that the linear accelerators in treatment facilities operate in a day. Considering that patients cannot be treated 7 days in a row due to toxicity, longer days were more feasible when compared with operating 7 days a week [1]. Operating for 10, 12, or 14 hours was considered and compared in terms of cost and benefit. A cost comparison was performed, and it was found that costs per visit were less with 12 hours of operation vs. adding new equipment to run on 10 hours of operation [1]. With this, the priority to make the gradual shift toward 12-hour treatment days was created. Specifically, those facilities with six or more treatment units are to run 12 hours on all their equipment, whereas those with less than six units are to run half of their equipment on 12 hours and the remaining half on 10 hours [1].

Method

A general research application was submitted to the Hamilton Integrated Research Ethics Board through their electronic project submission on May 26, 2015. Hamilton Integrated Research Ethics Board granted the study final approval on both ethical and scientific grounds on June 22, 2015 (Project number 0189). The approval is effective for 12 months beginning on the date of final approval.

A literature review was completed on the topic of 12-hour shifts and related areas. This included the advantages and disadvantages of working shifts, shifts in health care, shifts in nursing, 12-hour shifts and shifts in radiation therapy. Some areas of research themes were fatigue and burnout, sleep and recovery, job performance, job satisfaction, health and safety, absenteeism, and individual tolerance.

A survey was developed based on the themes that were reviewed in the current literature and was distributed to 126

RTs at the Juravinski Cancer Centre (JCC) and the Walker Family Cancer Centre (WFCC). Because this was a student project, there was limited time to perform a pilot study to validate the survey questions. The survey consisted of 25 questions: 17 quantitative questions on a 5-point Likert Scale, two qualitative questions, and six demographic questions.

The programs Mini-Tab and Microsoft Excel were used to calculate the data. A P value of $<.05$ was considered to be statistically significant. Data were analyzed using the Sign test and Kruskal–Wallis test to determine the difference from the null hypothesis (neutral). The sample median for each question was calculated using Minitab. For the quantitative questions, the hypothesis was maintained to be different from “neutral.” A Sign test was performed for each of the quantitative questions to produce a P value ($P < .05$). A Kruskal–Wallis Test was conducted on each of the quantitative questions to determine if the responses were statistically significant in terms of demographics.

Results

There were 48 respondents to the survey. Questions 20–25 of the survey were demographic questions that concluded the survey; the results are outlined in Table 1.

Table 1
Summary of the Responses for Section C (Demographic Questions) of the Survey—Questions 20–25

| Demographic | Responses (% of Total 48 Participants) | |
|--|--|-------|
| Gender | Male | 25 |
| | Female | 75 |
| Age | 20–25 | 18.8 |
| | 26–30 | 20.8 |
| | 31–35 | 12.5 |
| | 36–40 | 8.3 |
| | 41–45 | 10.4 |
| | 46–50 | 10.4 |
| Years of experience as a radiation therapist | 51+ | 18.8 |
| | 0–5 | 39.6 |
| | 6–10 | 14.6 |
| | 11–15 | 6.3 |
| | 16–20 | 10.4 |
| Workplace | 21–25 | 8.3 |
| | 26+ | 20.8 |
| Experience with 12-h shifts | JCC | 89.6 |
| | WFCC | 10.4 |
| Experience with 10-h shifts | Yes | 12.5 |
| | No | 87.5 |
| Experience with 10-h shifts | Yes | 56.3* |
| | No | 41.7* |

For Section B of the survey, two questions were asked that required written responses, these were questions #18 and #19. Number 18 asked the participant for their opinion on the advantages of 12-hour shifts, whereas question 19 asked for their opinion on the disadvantages of 12-hour shifts. There were 43 (89.6%) surveys in which question #18 (advantages) had written comments completed, and 40 (83.3%) surveys in which questions #19 (disadvantages) had written comments completed. Thematic analysis was used to identify the common statements (Tables 2 and 3).

* Percentage of total 47 participants.

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