Impact of Medical Director Certification on Nursing Home Quality of Care

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Objective: This study tests the research hypothesis that certified medical directors are able to use their training, education, and knowledge to positively influence quality of care in US nursing homes.

Design: F-tag numbers were identified within the State Operations Manual that reflect dimensions of quality thought to be impacted by the medical director. A weighting system was developed based on the "scope and severity" level at which the nursing homes were cited for these specific tag numbers. Then homes led by certified medical directors were compared with homes led by medical directors not known to be certified.

Data/participants: Data were obtained from the Centers for Medicare & Medicaid Services' Online Survey Certification and Reporting database for nursing homes. Homes with a certified medical director (547) were identified from the database of the American Medical Directors Association.

Measurements: The national survey database was used to compute a "standardized quality score" (zero representing best possible score and 1.0 representing average score) for each home, and the homes with certified medical directors compared with the other homes in the database. Regression analysis was then used to attempt to identify the most important contributors to measured quality score differences between the homes.

Results: The standardized quality score of facilities with certified medical directors (n = 547) was 0.8958 versus 1.0037 for facilities without certified medical directors (n = 15,230) (lower number represents higher quality). When nursing facility characteristics were added to the regression equation, the presence of a certified medical director accounted for up to 15% improvement in quality.

Conclusions: The presence of certified medical directors is an independent predictor of quality in US nursing homes. **(J Am Med Dir Assoc 2009; 10: 431–435)**

Keywords: Certified medical director; quality of care; medical director; nursing facility; skilled nursing facility

Since the introduction of the concept of nursing home medical directors in the 1970s there have been multiple papers, guidelines, and books published on the role of the medical director and how this should affect the quality of care in the nursing home.

There has, however, been no clear quantification of the impact that a well-trained medical director can have on the quality of care within a facility.

The official mission statement of the American Medical Directors Certification Program (AMDCP) is to "…advance physician leadership…thereby enhancing quality of care."[1] Since its inception in 1991, the AMDCP has certified more than 2500 medical directors. The certification process follows an "experiential" model that incorporates existing mechanisms such as fellowship programs, board certification, continuing medical education programs (offered by major provider organizations), courses in medical direction (approved by AMDCP), and other continuing education programs. Familiarity with the medical director certification process leads to the expectation that medical director certification is positively correlated with quality of care. Although such a correlation is commonly and reasonably asserted, we have found nothing in the literature empirically demonstrating such a relationship.

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This study tests the hypothesis that certified medical directors are able to use their training, education, and knowledge to positively influence quality of care in US nursing homes. The alternate hypothesis (or null hypothesis) is that certification makes no appreciable difference to nursing home quality of care.

METHODOLOGY

F tags from the State Operations Manual[2] (N = 27) were identified that appear to reflect dimensions of quality potentially directly impacted by the medical director. These were chosen by consensus of the research team including the authors, AMDCP staff, and the AMDCP Executive Committee on the premise that these were areas of quality potentially influenced by medical director activity. A weighting scheme based on the "scope and severity" level at which the nursing homes were cited for these specific tag numbers was also developed. This was constructed to emphasize serious, widespread, or patterns of deficiencies. It was thought that a better prepared medical director would be able to reduce the incidence of deficiency citations for these 27 specific F tags, or, at a minimum, reduce the scope and severity level at which they were cited. A listing of the 27 F tags and our scope and severity–based weighting scheme is listed in Appendix 1. The weighting scheme is similar, though not identical, to that used by the Nursing Home Compare Five-Star Rating guide.[3]

Using the Centers for Medicare & Medicaid Services' Online Survey Certification and Reporting (OSCAR) database as of March 2008, a "raw quality score" was computed, and a "standardized quality score" for all 15,777 certified nursing homes that were in operation in the United States in March 2008.[4] The raw quality score was computed by summing the weights of the relevant deficiency citations. We then divided the raw quality score by the state average raw quality score to yield a standardized quality score. Standardization of the quality score is necessitated by wide state-to-state variation in the survey process. For example, New Jersey nursing home surveys result in an average of 4 total deficiencies per survey, whereas in neighboring Delaware the comparable average is 13.[5] Dividing the raw quality score by the state average "standardizes" the score, creating a measure that is comparable across states. Note that lower adjusted quality scores denote better quality, and an adjusted quality score of unity denotes average quality.

Records of the American Medical Directors Association (AMDA) were then used to identify 547 nursing homes that had certified medical directors during the year immediately preceding and during the survey contained in our data capture. The first step was to compare the average standardized quality score in facilities with certified medical directors to those without certified medical directors. A "*t* test" was then computed to evaluate the degree to which the difference between the averages was statistically significant. Finally, other variables were considered that could also affect quality, and multiple regression analysis was used to better understand the relationship between medical director certification and quality of care.

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FINDINGS

As shown in Table 1, the average standardized quality score (SQS) in facilities with certified medical directors was 0.8958 compared with 1.0037 for facilities without certified medical directors. Recall that lower numbers represent better quality, with zero representing the best possible score. The difference of 0.1079 represents a 12% improvement in quality associated with the presence of a certified medical director, and the *t* test indicated that the difference is statistically significant at the 98% level.

It was suspected, however, that other nursing home characteristics are correlated with quality, such as facility size, class of ownership, case mix, staffing, and urban/rural status. Smaller facilities should tend to have fewer deficiencies because of fewer opportunities for errors, and not-for-profit facilities are known to have better surveys than for-profit facilities.[5] The higher case mix associated with more medically complex cases might result in more deficiencies, higher staffing would be expected to result in fewer deficiencies, and rural facilities might have better surveys than urban facilities. The urban/rural impact on quality, if there is one, might more accurately be associated with size or staffing differences between urban and rural nursing homes.

There appears to be significant potential for the statistical relationships hypothesized in the preceding paragraph to confound the initial findings reported in Table 1. For example, what if facilities with certified medical directors are more likely to be small, or more likely to be not-for-profit? If that were the case, then the variation in quality of care that is attributed to medical director certification in Table 1 might in fact be attributable to these other factors. Stepwise multiple regression analysis was used to help determine if this might be the case and to better understand the relationship between quality and medical director certification. Data from the best specified equation are reported in Table 2. It was found that the strongest predictors of adjusted quality were whether or not the nursing home had a certified medical director, whether or not the total number of beds in the facility was greater than 99, whether or not it was a proprietary (for-profit) facility, and the number of registered nurse (RN) staffing hours per patient day.

Recall that the average adjusted quality score is 1.0000 and that lower numbers reflect better quality. Thus, the

Table 1. *Average Standardized Quality Score With and Without a Certified Medical Director (CMD)*

With CMD (n=547)	0.8958
Without CMD (n=15,230)	1.0037
Difference #	0.1079
Difference %	12.05

Table 2. *Regression Equation Predicting Standardized Quality Score*

Dependent Variable: Adjusted Quality Score					
Number of observations read					15777
Number of observations used					15618
Number of observations with missing values					159
Analysis of Variance					
Source	**DF**	**Sum of Squares**	**Mean Square**	**F Value**	**Pr>F**
Model	4	562.03592	140.50898	58.61	<.0001
Error	15613	37431	2.39739		
Corrected total	15617	37993			
Root MSE		1.54835	R-Square		0.0148
Dependent mean		1.00559	Adj R-Square		0.0145
Coefficient of variation		153.97489			
Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**T Value**	**Pr>/t/**
Intercept	1	0.98780	0.03461	28.54	<.0001
Certified medial director present	1	−0.14705	0.06783	−2.17	.0302
Beds >99	1	0.22309	0.02546	8.76	<.0001
For profit	1	0.08987	0.02744	3.7	.0011
Registered nurse hours per patient day	1	−0.24987	0.02918	−8.56	<.0001

estimated regression coefficient of –0.14705 for the certified medical director variable indicates that, holding other predictors constant, the presence of a certified medical director will improve quality by about 15%. Other results from the regression equation were consistent with stated preconceptions, ie, larger facilities, proprietary facilities, and facilities that staff fewer RN hours per patient day tend to have poorer quality. Urban/rural status and case mix are not included in the equation as they did not improve equation specification.

DISCUSSION

For the first time, this study demonstrates that the certified medical director has a measurable positive effect on the quality of care provided in facilities in which they serve.

In 1975, regulations were promulgated that required skilled nursing facilities to have a medical director. In response to this, AMDA was formed in 1977 to organize the medical directors and provide a venue for education of the medical directors in their role and responsibilities. Numerous articles (representative articles in references) have been written since that time about the role of the medical director.[6–10] Articles have been written on specific problems in which the medical director can and should make a difference.[11–13] Textbooks on the role of the medical director[14,15] and long-term care medicine[16,17] have been published. To the best of our knowledge, only one has made an attempt to show via survey of medical directors and administrators in Maryland that requiring medical director training makes a positive difference in the quality of medical directorship provided.[18] In that study, which reports on a survey of medical directors and administrators following the institution of mandatory medical director education, there was consensus that the relationship between the medical director and other administrators in the nursing home was improved, that the medical director spent more time in the facility working on system issues, and that the medical director spent more time with the administrator reviewing the care provided. In contrast, the present study uses a comparison of actual survey data from the facilities.

The current study was initiated in an attempt to demonstrate whether the presence of a certified medical director made a measurable difference in the quality of care provided within long-term care facilities. The results support the conclusion that the presence of a certified medical director makes an appreciable and positive difference on the quality of care provided within long-term care facilities. The data also support the premise that there are other important factors determining the quality of care provided.

OTHER FACTORS AFFECTING RESULTS

There is great confidence that all 547 nursing homes that were flagged as having certified medical directors during the study period actually did have certified medical directors because all certified medical directors identified their facility as where they worked in their medical director role for AMDA records in the time frame immediately before this study. The comparison group of 15,230 facilities that are treated as not having a certified medical director may actually contain facilities that may have had a certified medical director during all or part of the study period. This is likely, because of the 2500 certifications awarded, it is estimated via AMDA records that approximately 1500 of these individuals are still working. If the truth is that certified medical directors are associated with higher quality, then including facilities in the control group that actually had certified medical directors would tend to reduce the difference between the 2 comparison groups. Thus, if there were inadvertently

included facilities in the comparison group that had certified medical directors, then the true difference between the certified and noncertified groups was larger than what is reported, ie, the research results are even more robust than what is reported.

The probability values reported in Table 2 are for a 2-tailed *t* test. We could argue on theoretical grounds that the 1-tailed test is more appropriate. Interpreting our *t* ratios using a 1-tailed test would also make our results more robust, ie, double the level of statistical significance for each predictor variable.

Of note on the statistical analysis of the linear regression model is that the multiple correlation coefficient (R squared) is relatively low (0.0148); however, it needs to be placed in the context that the goal of this study was to test whether the presence of a certified medical director made a positive impact on the quality of care in that nursing home, not to explain the total variation in the quality measured. Thus, the magnitude of the partial correlation coefficient associated with the certified medical director variable (–0.14705) and its associated level of statistical significance (.0302) are of much greater importance than the absolute value of the multiple correlation coefficient.

Other factors that theoretically could bias the outcome are that 2 of the authors are currently certified medical directors and medical directors of facilities included in the database, however it is doubtful that 2 individual homes would bias the overall results in comparison with either the 547 identified facilities with a certified medical director or the 15,230 other facilities. A potentially more important variable is that many AMDA members have trained in geriatric fellowship programs and have certification in geriatric medicine. Of the certified medical director–led facilities in this study, 18% (101 of the 547) are led by medical directors with geriatric fellowship training. We did not attempt to separate out the contribution of this training in the current project, but a recent survey study examined barriers to care and visit time expectations, which revealed that geriatric-trained physicians may have a higher level of expectation in their care of long-term care patients.[19]

Currently, all long-term care facilities are required to have a physician identified as medical director. The data now reported suggest that there is a clear and measurable positive effect on quality if that medical director is a certified medical director. This may have policy implications in all of long-term care. Because the certified medical director designation indicates a minimum level of experience and education in medical director management and clinical geriatric medicine, it suggests that every long-term facility and program should have a certified medical director or the equivalent. An alternate explanation is that certified medical directors are a self-identified group of dedicated, experienced individuals who are willing to be held accountable as long-term care providers and leaders, and that they would be so whether or not they had attained recognition as a certified medical director. Whatever the reason, our patients deserve the best of all of us.

CONCLUSION

This research demonstrates that the presence of a certified medical director in a facility makes an appreciable positive difference in the quality of care provided in that facility. The data also identify other factors—small facility size, not-for-profit status, and higher RN hours per patient day—as important determinants of higher quality offered by a facility. It is hoped that this will lead to further recognition of the knowledge and skills of trained medical directors, and encourage all medical directors to work to attain and improve these skills.

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Appendix 1

F-tags Included in Standard Quality Scores

The following list of F-tags was determined by consensus to be those most likely to be directly influenced by the medical director.

F-Tag	Area of Medical Direction
202	Identify appropriate ways to minimize avoidable transfers
221–222	Restraints: Policies and procedures; alternatives to use
223	Freedom from abuse
280	Train attending physicians to help staff develop resident care plan
281–282	Medical direction—additional duties
309	QA relative to MDS
314	Pressure ulcers
319–320	Access to mental health treatment
323–324	Minimizing and reporting accidents
325	Weight loss and nutrition
329	Unnecessary drugs
385, 386, 387, 388, 390	Quality assurance issues around physician performance
441, 442, 443, 444	Infection control
492	Compliance with federal, state, and local laws and regulations; physician oversight; additional duties (see also 281–282)
501	Medical direction
520	Establish and implement a relevant facility-wide quality assurance program, including a QA committee

At the same time, the following weighting scale based on scope and severity was approved:

Scope and Severity Designation	Weight
A – isolated event, no actual harm	deleted, not significant to our study
B – possible pattern, no actual harm	0
C – widespread, no actual harm	1
D – isolated, no actual >minimal harm, no immediate jeopardy	1
E – possible pattern, no actual >minimal harm, no immediate jeopardy	2
F – widespread, no actual >minimal harm, no immediate jeopardy	2
G – isolated, actual harm, no immediate jeopardy	3
H – pattern, actual harm, no immediate jeopardy, substandard care	10
I – widespread, actual harm, no immediate jeopardy, substandard care	10
J – isolated, immediate jeopardy, substandard care	15
K – pattern, immediate jeopardy, substandard care	20
L – widespread, immediate jeopardy, substandard care	20