

Perceived Benefit of a Telemedicine Consultative Service on a Highly Staffed Intensive Care Unit



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Poster #102

Introduction

Highly staffed models of intensivist provider coverage have been associated with lower intensive care unit (ICU) and hospital mortality and reduced ICU and hospital length of stay, but intensivists currently provide care in only one third of ICU's. This problem is compounded by the aging population which will utilize more ICU resources and exacerbate the gap between intensivist supply and demand. Telemedicine is one tool that has been proposed to extend current intensivist resources.

Multiple research studies have attempted to study the efficacy of ICU telemedicine, but the results have been mixed. Staff perceptions of ICU telemedicine, which may be perceived as threatening to existing unit culture, can affect staff "buy-in" and thus adoption of an ICU telemedicine program. Lack of adequate adoption and utilization may be one factor in studies which have failed to show efficacy. However, improving patient care through telemedicine can potentially improve the satisfaction of bedside staff.

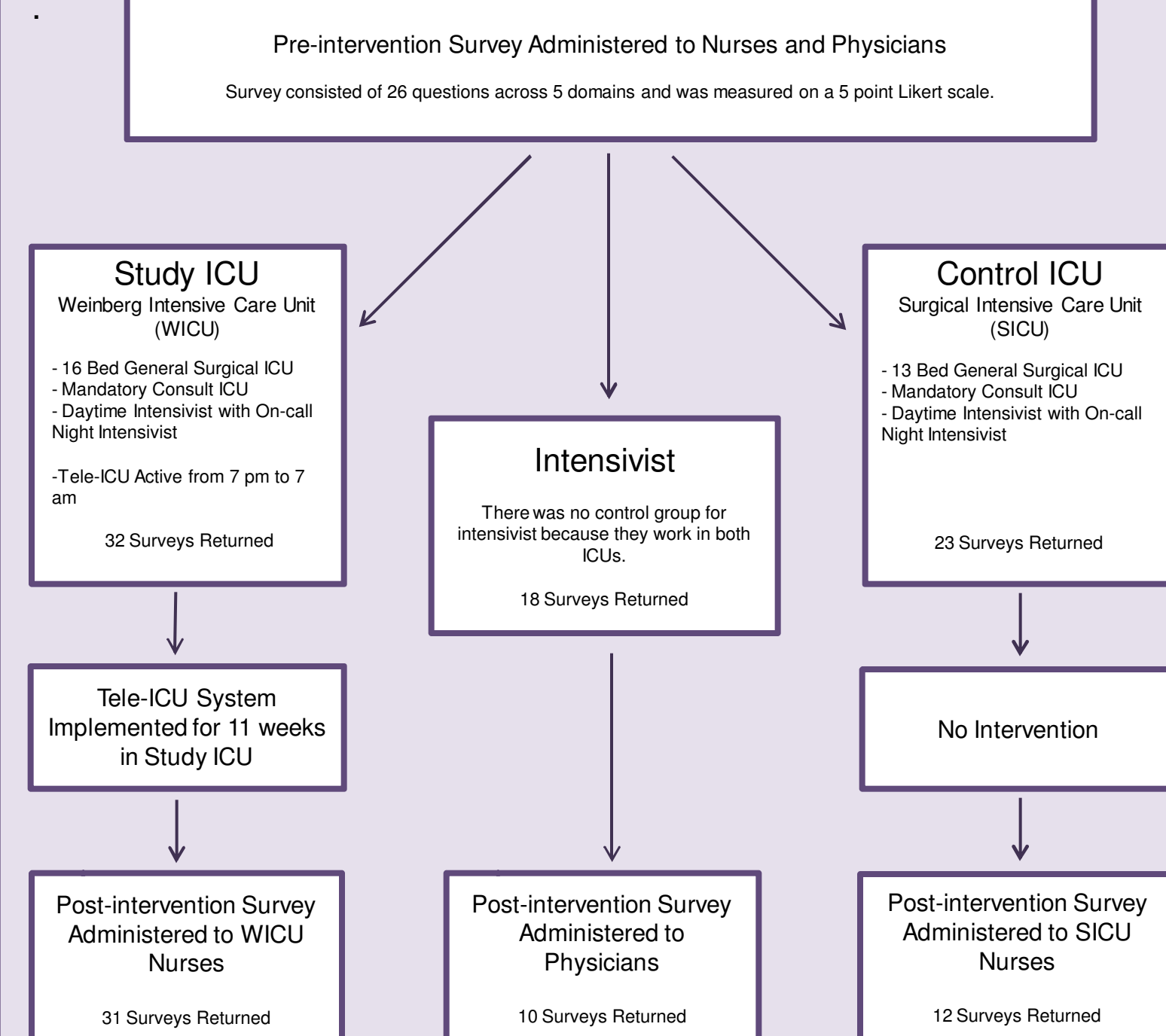
Materials and Methods

The tele-ICU system consisted of a one physician and one nurse team which staffed the tele-ICU from 7 pm to 7 am. The tele-ICU staff had access to the patient electronic data record. Two-way audio-visual communication was accomplished with a robotic interface (InTouch Health RP7) and providers had access real-time hemodynamic information with independent customizable alarms and an interface which allowed simultaneous monitoring of all patients within the ICU (Bernoulli, Cardiopulmonary Group).

Staff satisfaction was measured prior to implementation and after completion of the intervention using a previously validated survey tool. Questions were grouped into one of five subscales and responses were measured using a five point Likert scale. Responses to individual questions, question subgroups, and aggregate Likert scale changes were compared using paired t-testing with 95% confidence intervals. P values less than 0.05 were considered to be statistically significant.

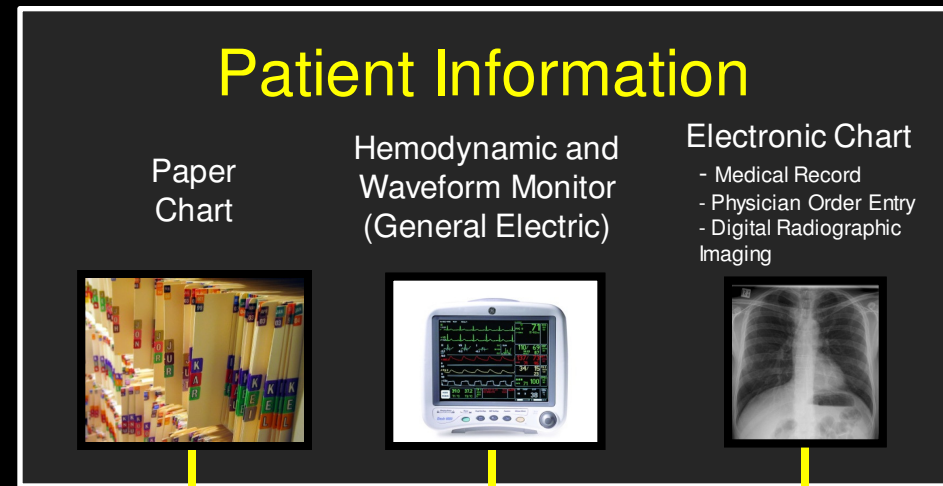
Prior to implementation of the tele-ICU program, surveys were obtained from 23 SICU nurses, 32 WICU nurses, and 18 intensivists. After implementation, surveys were obtained from 12 SICU nurses, 32 WICU nurses, and 10 intensivists. Of the staff that participated in the first half of the study, surveys were obtained from 11 SICU nurses, 27 WICU nurses, and 9 intensivists upon completion of the Tele-ICU program.

Project Timeline



Design of the Johns Hopkins Pilot Tele-ICU

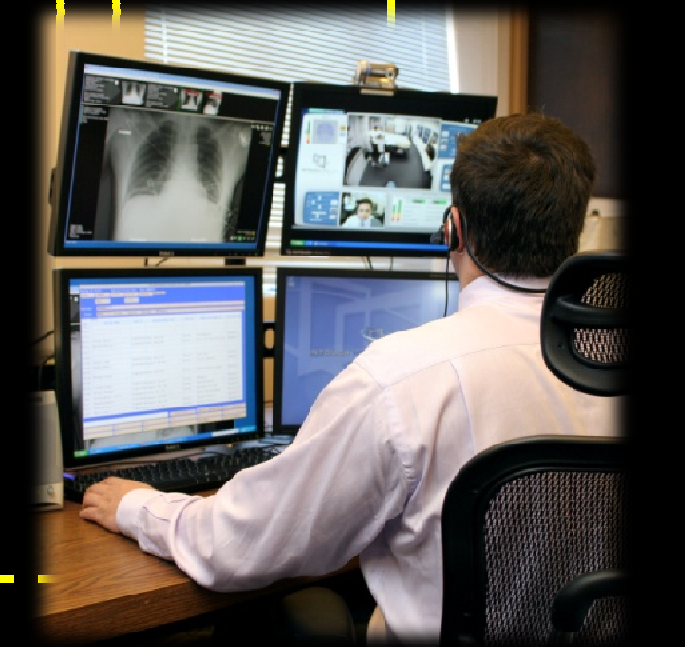
Bedside Healthcare Provider



No Access

Monitor Interface Hardware (CPC Group)

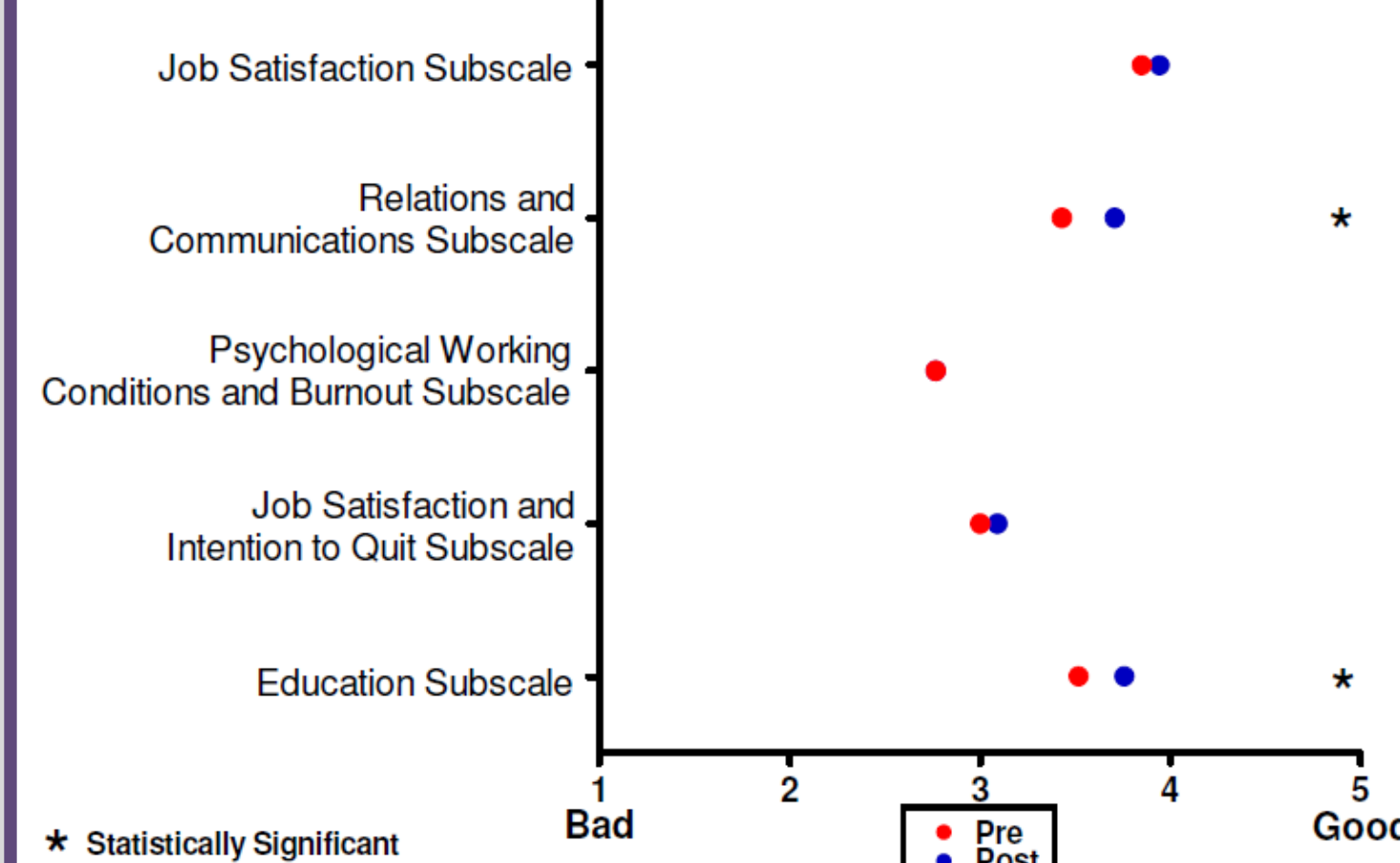
Software Interface (Bernoulli, CPC)



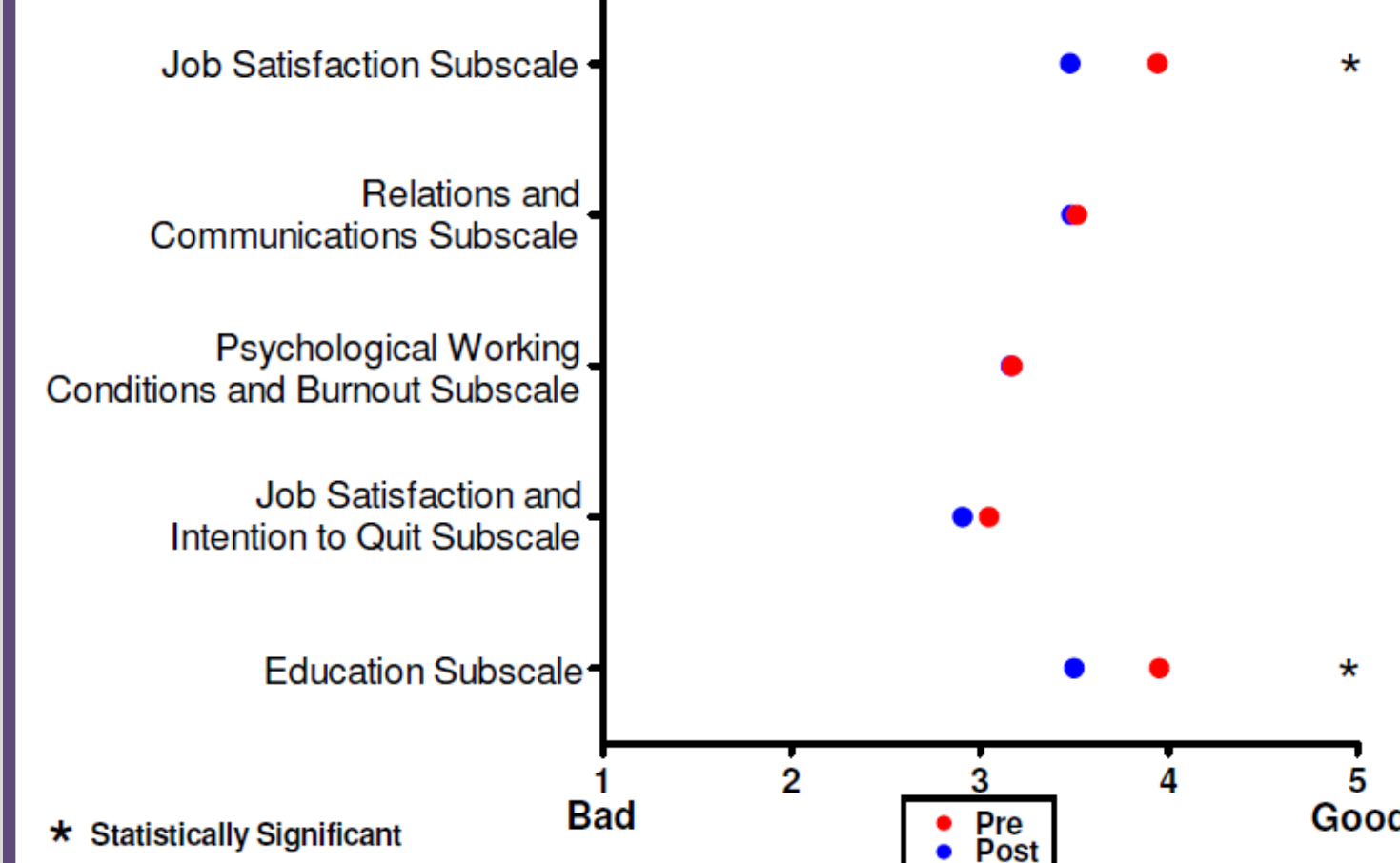
Remote Provider Workstation
1 Nurse and 1 Physician



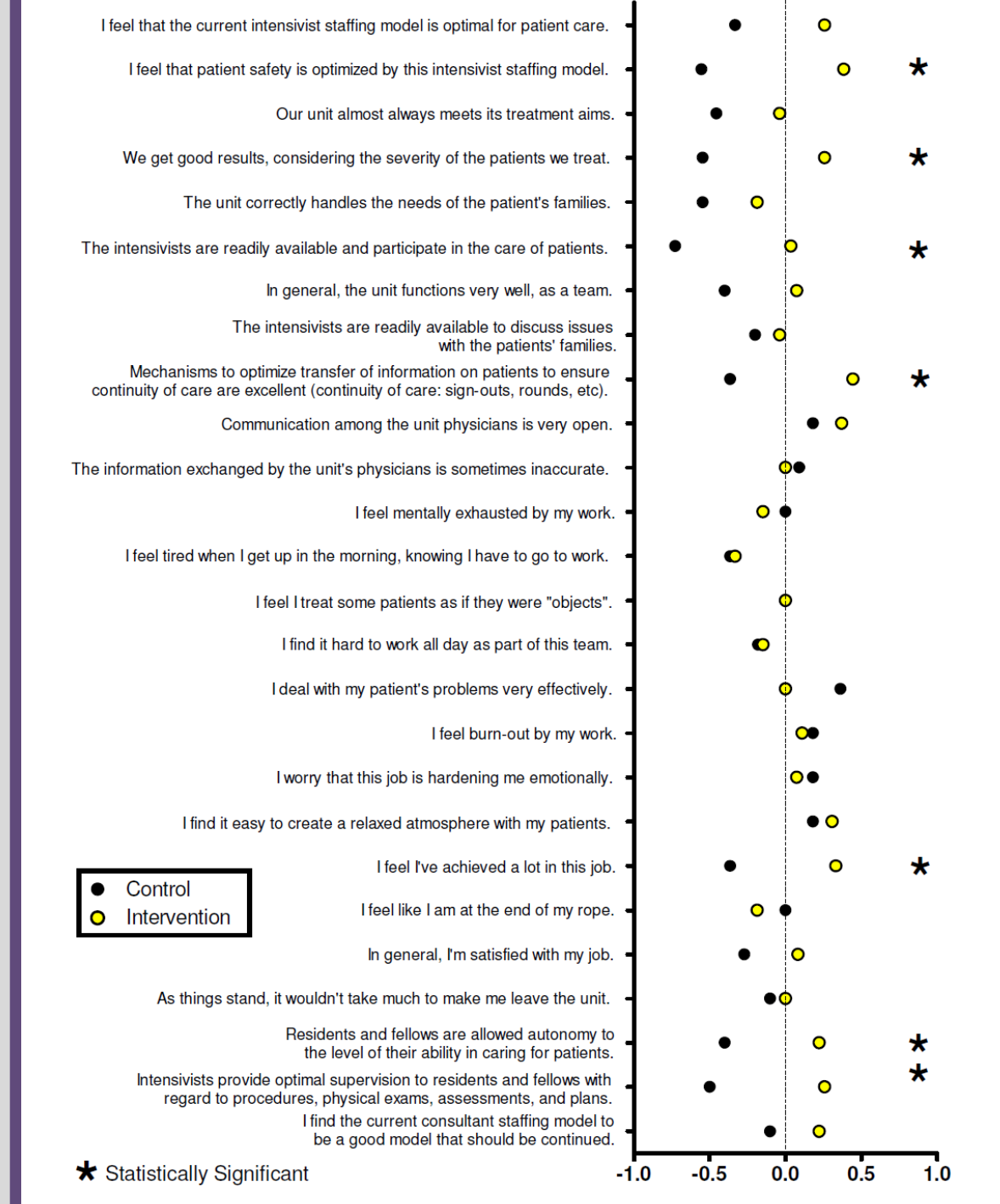
Domain specific comparison of nurse survey responses in the study ICU measured on a 5 point Likert scale



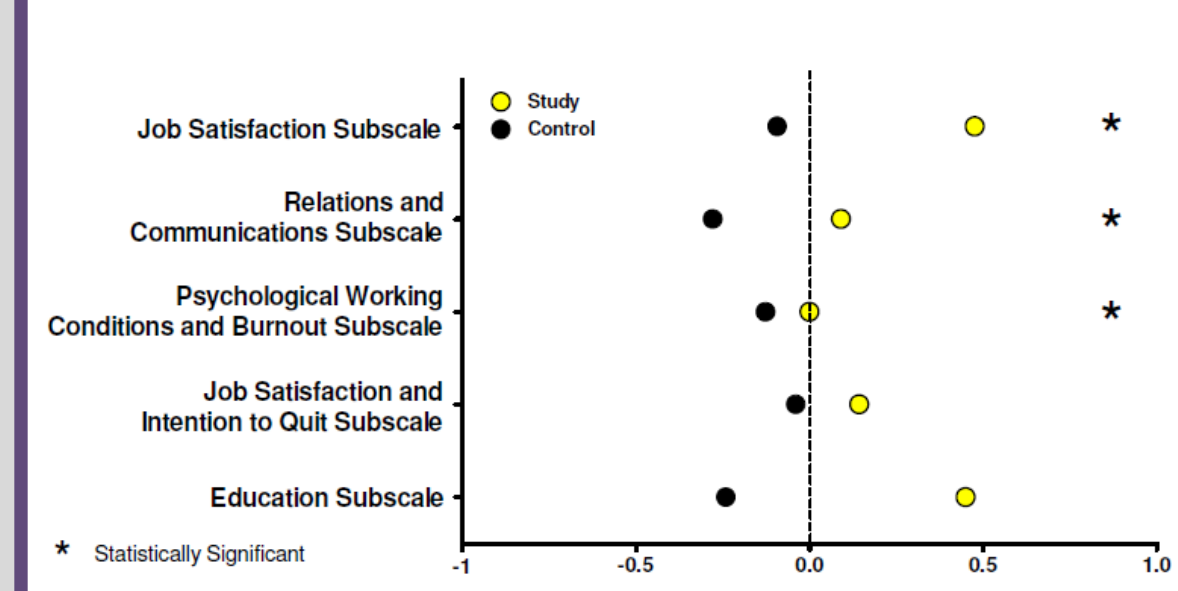
Domain specific comparison of nurse survey responses in the control ICU measured on a 5 point Likert scale



Comparison of the change in survey responses between the study and control ICU nurses



Domain specific comparison of the change in survey responses between the study and control ICU nurses



Intensivist Response

The intensivists in our study worked in both the control and the study ICU. There were few paired intensivist responses (n=9) due to the short length of the study. Intensivist's responses showed improvement for the questions "I rapidly obtain the relevant information when a patient's condition changes" and "I deal with my patient's problems very effectively." There was a negative correlation with "In general, the unit functions very effectively, as a team."

Results

Within the WICU, significant improvements were seen in staff perceptions of communications, psychological working conditions, and education. At the same time, perceptions of effectiveness and education declined in the SICU. Among the intensivists, significant changes were noted on individual questions related to effectiveness, communication, and psychological working conditions.

Conclusions

Telemedicine has traditionally been thought of as a means to bring intensivist resources to understaffed ICU's, typically in rural or community hospitals, or to provide nocturnal coverage in ICU's that only have a day intensivist. Our study showed that the introduction of ICU telemedicine services in a highly staffed academic ICU was associated with an improvement in nursing perceptions of working conditions and communications. This is the first study which uses a contemporaneous control ICU to study this effect.

Reference

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Acknowledgements

The authors would like to Dr. John Ulatowski, the Johns Hopkins Department of Anesthesiology and Critical Care Medicine, Alex Nason, Johns Hopkins International, Steve Mandel, Johns Hopkins Information Services, Samantha Young, Judy Schroeder, and Gail Biba for their help and support of this project.

For information on compliance improvement, see poster #582 by Latif et al.

A Consultative Telemedicine Service Improves Compliance With Best Practice Guidelines in a Highly Staffed Intensive Care Unit