The Value of School Nursing

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Mary Ann Gapinski, MSN, RN, NCSN
MA Department of Public Health

Cost-Benefit Study of School Nursing Services
Centers for Disease Control
Division of Adolescent and School Health

Authors:
Li Yan Wang (PI)
Mary Vernon-Smiley
Mary Ann Gapinski
Marie Desisto
Erin Maughan
Anne Sheetz

Introduction

- The demand for school nursing services has increased:
  - The prevalence of chronic health conditions
  - The right and access to education
  - Improved medical technology
  - More working parents
- The position of NASN:
  - Every school-aged child deserves a registered professional school nurse
  - Every school should have a full-time nurse
  - Only 45% of schools across the nation meet this recommendation
- Massachusetts current ratio under ESHS funding:
  - 412 students per nurse, ESHS districts;
  - 438 students per nurse, ESHS partner districts

Purpose of this study

- the cost-benefit of school nursing services delivered by full-time registered school nurses
- The objective of this study was to conduct a case study of the Massachusetts Essential School Health Services (ESHS) Program to demonstrate the cost-benefit of school nursing services delivered by full-time registered nurses. Nursing services delivered by full-time registered school nurses
- This study can help school policy makers and decision makers better understand the value of school nursing services (ESHS) Program to demonstrate the cost-benefit of school nursing services delivered by full-time registered school nurses

Study site

- Massachusetts ESHS Program
  - ≥1 full-time registered school nurse per school
  - Direct care, health education, case management, policy/program development and oversight
  - Monthly activity report
  - Annual data report

- On-site school nursing services were found to
  - Improve student attendance (Telljohann 2004 and Weisnulter 2007)
  - Reduce teacher time spent on addressing health issues (Baish 2011 and Hill 2012)
- No study assessed the economic impact
- School nursing services must not only be shown effective but also cost-effective
Study site
The 2009-2010 ES HS report
- No. of districts: 78
- No. of schools: 933
- No. of students: 477,163
- No. of school nurses: 1,157
- No. of student health encounters: 4,946,757
- No. of staff health encounters: 99,903
- No. of medications administered: 1,191,060
- No. of medical procedures performed: 1,016,140
- Early dismissal rate: 6.2%

Study design
- Societal perspective and standard cost-benefit analysis methods were used
- The ES HS program was compared with a “no school nursing services” scenario
- Data sources:
  - The 2009-2010 ES HS report data
  - Published estimates:
    - Early dismissal rate without a school nurse
    - Teachers’ time spent on health issues with/without a school nurse
    - Physicians Fee and Coding Guide (PFCG), CPT codes, HCPC code book, and Massachusetts Medicaid Fee Schedule

Study design
- In each scenario we estimated:
  - Health care costs
    - Medical procedures
  - Parents’ productivity loss costs
  - Medication administration
  - Early dismissals
  - Teachers’ productivity loss costs
    - Teachers’ time spent on addressing health concerns
- Program benefits were measured as costs averted when compared with the “no school nursing services” scenario

Study design
- Program costs:
  - Nurse salary and fringe benefits
  - Medical equipment and supplies
- Cost-benefit measures:
  - Net benefits
  - Benefit cost ratio
- All costs and benefits in 2009 dollars

Medical procedures
<table>
<thead>
<tr>
<th>Respiratory</th>
<th>Diabetic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Flow Monitoring</td>
<td>Blood Glucose Testing</td>
</tr>
<tr>
<td>Nebulizer Treatment</td>
<td>Insulin Pump Care</td>
</tr>
<tr>
<td>Oxygen Administration</td>
<td>Carbohydrate/Insulin Calculation</td>
</tr>
<tr>
<td>Oxygen Saturation Check</td>
<td>Check Ketones</td>
</tr>
<tr>
<td>Tracheostomy Care</td>
<td>G/G</td>
</tr>
<tr>
<td>Suctioning</td>
<td>Tube Care or Usage</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>Catheter Care</td>
</tr>
<tr>
<td>Blood Pressure Monitoring</td>
<td>Ostomy Care</td>
</tr>
<tr>
<td>Central Line Care</td>
<td>Weight Measurement</td>
</tr>
<tr>
<td>IV Infusion Care</td>
<td>Other</td>
</tr>
<tr>
<td>Orthopedic</td>
<td>Wound Care</td>
</tr>
<tr>
<td>Device Adjustment</td>
<td>Administer Immunizations</td>
</tr>
<tr>
<td>Physical Therapy</td>
<td>Auscultate Lungs</td>
</tr>
</tbody>
</table>

Health care costs associated with medical procedures
- The reported type and number of procedures evidenced students’ needs during school hours
- We assumed all those procedures would have been performed by physicians or nurses in a medical setting or by a parent when there was no school nurse
- To estimate health care costs:
  - Identified CPT and HCPC codes
  - Identified medical costs from:
    - 2009 Physicians Fee and Coding Guide
    - HCPC code book
    - 2012 Massachusetts Medicaid Fee Schedule
Health care costs associated with medical procedures

- **Health insurance of the ESHS students**
  - 64.1% private
  - 34.6% public
  - 1.2% no insurance

- **Base case analysis**
  - Weighted average costs of private insurance and public insurance

- **Sensitivity analysis**
  - Weighted average costs ± 20%

Costs of parents’ productivity loss associated with student early dismissal

- **Value of a lost day for an adult**
  - $137 (sum of average annual earnings and household services divided by 365)

- **Number of school hours missed per early dismissal**
  - Wyman (2005): 42.3% in the first half
  - Base case analysis: 3 hours
  - Sensitivity analysis: 2-4 hours

- **Costs of parents’ productivity loss** = No. of health encounters × dismissal rate × hours missed per dismissal × value of a lost hour

Costs of parents’ productivity loss associated with medication administration

- **MA regulation**: parents have to administer medications if there is no nurse at school

- **Parents’ time spent at school**
  - Base case analysis: 30 minutes
  - Sensitivity analysis: 15-60 minutes

- **% of medication doses**
  - Base case analysis: 74.4%
  - Sensitivity analysis: 60%-100%

- **Costs of parents’ productivity loss** = No. of doses × parents’ time spent on medication administration × value of a lost hour

Costs of teachers’ productivity loss

- **Teachers’ time spent on health issues**
  - Baisch (2011), 565 teachers in a large urban district, Midwestern city
    - 6 minutes with a nurse
    - 26 minutes without a nurse
  - Hill (2012), 2-year, 435-444 elementary school teachers in North Carolina
    - 80 minutes with nurse present 2 h per day
    - 46 minutes with nurse present 3.6 h per day
  - Base case analysis: 6 and 26 minutes
  - Sensitivity analysis: vary the difference of 20 minutes in a range of 0-40 minutes

Costs of teachers’ productivity loss

- **The 2009-10 MA Teacher Salaries Report**
  - Number of teachers: 34,283
  - Average salaries & benefits: $91,255

- **Costs of teachers’ productivity loss** = number of teachers × annual number of hours per teacher spent on addressing health issues × the average hourly pay and fringe benefit per teacher
Sensitivity analysis

- Uncertainty caused by
  - Assumptions made in this study
  - Parameter estimates derived in published studies
- Multivariate sensitivity analysis on all major parameters
  - No. of hours of school missed per dismissal
  - Dismissal rate without nurse contact
  - Parents’ time spent for medication administration
  - % of doses administered by parents
  - Teachers’ time spent w and w/o a school nurse
  - Medical care costs of procedures
  - Monte Carlo simulation of 10,000 trials

Summary

- The ESHS program was cost-effective and generated net benefits to society
- The actual net benefits might be much higher if other benefits were counted
  - Saved co-pays and deductibles by families
  - Reduced 911 calls, ER visits, and hospitalizations
  - Reduced health screenings by physicians
  - Increased attendance and reduced dropout rates
  - Reduced teacher time for medical procedures
  - Benefits from other service activities
    - Linking students to insurance and health providers
    - Health education and promotion
    - Identifying undiagnosed conditions

Implications

- School nursing services can be
  - Cost-beneficial
  - One of the ways to create a more efficient, cost effective health care system
  - A benefit to employers, insurance providers, and education sector through
    - Increased worker productivity
    - Averted medical care costs
    - Increased teacher productivity
- Creative and strategic collaborative efforts by all sectors may be needed to determine how school nurse positions can be made more available within schools

Limitations

- The benefits of the ESHS program were projected, not measured
- The cost benefit estimates generated in this study may not be generalizable to other states
- Only a single data source was available for some input parameters
- Assumptions were made for certain input parameters when there was no available data

Future research

- The analytical approach developed in this study can be used to assess other programs
- School nurses should regularly
  - Record their service activities
  - Collect data on school absence, early dismissals, teacher time spent, medication administration and 911 calls when there is no nurse present at schools
- Future research should assess
  - Impact on health screenings, 911 calls, ER visits, and hospitalizations
  - Impact on early dismissals, medications administration, and teacher time spent

Future research

What’s missing from this report?

- This study examined “what school nurses do”
- Must begin to study “what school nurses watch out for” – Professional Vigilance
Notes on Nursing (Nightingale, 1860)

The most important practical lesson that can be given to nurses is to teach them what to observe – how to observe – what symptoms indicate improvement – what the reverse – which are of importance – which are of none – which are evidence of neglect – and of what kind of neglect. All this is what ought to make part, an essential part, of the training of every nurse (p.105).

Professional Vigilance

- Essence of school nursing practice...
- Contribution of school nursing vigilance to student safety and health must be effectively communicated, documented and measured.

Measuring Vigilance

Parents should be concerned with school nurses’ ability to be vigilant care givers:
- MA CQI Project: Diabetes Time Study (90 minutes per day per student newly diagnosed with diabetes)
- NBCSN Role Delineation Study (RDS)

Purpose of RDS

- Role delineation or job analysis studies are carried out at the national level with the goal of describing current practice expectations, performance requirements, and environments.

- The findings are used to update the content of each nursing specialty organization certification examination.

School Nursing Knowledge Base

- Professional Vigilance:
  - Attaching meaning to what is
  - Calculating the risks
  - Anticipating what may be
  - Staying ready to act
  - Monitoring results/outcomes

- Informs Nursing Action:
  - Assessment
  - Diagnosis
  - Intervention

Critical Thinking Skills

RDS Development

- November 2011-Task Force Members
- Reviewed tasks from previous 2007 RDS
- Developed and refined those tasks
- March 2012- RDS sent to NCSNs and NASN members
- June 2012- RDS analyzed by PTC
RDS Composition

Final:
- 220 Task Statements
- 37 Knowledge Areas
- 20 Demographic Questions

Measure of School Nursing Activities

- Frequency of performance
- Importance of the task for competent performance
- Consequence of performing the task incorrectly

Survey Respondents

NCSNs and NASN members:
- 920 completed survey
- 99% female
- >90% Caucasian
- 47 States represented (MA n=279)
- Median of 24.5 years of nursing practice
- Median age 48
- 63% Nationally Certified School Nurses (NCSN)
- 82% NASN members

Ratings

- Frequency Ratings
  - How often is this task performed as part of the job?
  - 4 = Regularly
  - 3 = Frequent
  - 2 = Occasionally
  - 1 = Never

- Importance Ratings
  - How important is this task for competent performance?
  - 4 = Extremely
  - 3 = Moderately
  - 2 = Slightly
  - 1 = Not Important

- Consequence Ratings (Criticality)
  - What is the consequence of performing this task incorrectly?
  - 3 = Severe
  - 2 = Moderate
  - 1 = Little or No Harm

Most Frequently Performed Tasks

- Interview student for chief complaint
- Listen actively to student concern
- Document
- First Aid
- Communication

Most Important Tasks for Competent Performance

- Assist with glucose and ketone monitoring
- Evaluate for abnormal blood glucose
- Administer injections
- Administer medications
- Assist with carbohydrate/insulin calculations
- Call 911/EMS
- Perform CPR
Consequence of Performing the Task Incorrectly - Most Harm
- Assessing student for suicide risk
- Assisting with glucose and ketone monitoring
- Evaluating for abnormal blood glucose
- Administering injections
- Calling 911/EMS/ CPR-AED use

Attaching Meaning
Requires professional nursing knowledge, experience and skills.....
- What is going here......observing
- What does this mean....assessing
- Is it significant....planning
- What action is needed....intervening

Vigilance....what we do
- Monitoring respiratory status
- Assessing risk for anaphylaxis
- Assisting with diabetes monitoring......
- Observing for escalating “out-of-control” behavior
- Assessing student for suicide risk.....

“The art of watching out...results in a decision to take, or not to take, action.”

Vigilance
Cannot be matched by unlicensed personnel taught only to collect and record health information...do not have the educational preparation and professional experience to attach meaning to the data.....

But...it is only through action that others see that vigilance has occurred.

Documenting Vigilance
- Clinical judgment
- Recognition of problem or diagnosis
- Precedes intervention

Must try to capture and document “risk” for hypoglycemia...concussion....infection.....hemorrhage....suicide....etc...the “mental work” of what we do.

Only then....
..can we place the true value and impact of professional school nursing practice on student learning and achievement.
References

Allen, 2003
Baisch, 2011
Clarke and Aiken, 2003
Hill, 2012
Kendall-Gallagher, 2011
Kohl-Malone and Dewey-Bergren, 2010
Meyer and Lavin, 2005
NBCSN RDS report, 2013
Nightingale, 1890
Pennington, 2008
Telljohann, 2004
Weisnuller, 2007
Wyman, 2005