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Translation of Obesity Practice Guidelines: Measurement and Evaluation

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Abstract

Objective(s)—A public health nurse (PHN) in the Midwestern United States (U.S.) led a collaborative system-level intervention to translate the Institute of Clinical Systems Improvement (ICSI) Adult Obesity Guideline into interprofessional practice. This study 1) evaluated the extent of guideline translation across organizations and 2) assessed the Omaha System as a method for translating system-level interventions and measuring outcomes.

Design and Sample—This retrospective, mixed methods study was conducted with a purposeful sample of one administrator ($n=10$) and two to three clinicians ($n=29$) from each organization ($n=10$).

Measurements—Measures: Omaha System Problem Rating Scale for Outcomes Knowledge, Behavior, and Status (KBS). Procedures and analysis: KBS ratings gathered from semi-structured interviews and Omaha System documentation were analyzed using standard descriptive and inferential statistics and triangulated findings with participant quotes.

Results—KBS ratings and participant quotes revealed intervention effectiveness in creating sustained system-level changes. Self-reported and observed KBS ratings demonstrated improvement across organizations. There was moderate to substantial agreement regarding benchmark attainment within organizations. On average, self-reported improvement exceeded observer improvement.

Conclusions—System-level PHN practice facilitator interventions successfully translated clinical obesity guidelines into interprofessional use in health care organizations. The Omaha System Problem Rating Scale for Outcomes reliably measured system-level outcomes.

Keywords

Adult; Health Promotion; Health Care Reform; Obesity; Omaha System; Practice Guidelines as Topic; Program Evaluation; Public Health Practice; Public-Private Sector Partnerships; Primary Health Care; Standardized Terminology

Background

Obesity prevalence continues to escalate in the United States (U.S.) with associated increases in healthcare costs and social burden (Ogden, Carroll, Kit, & Flegal, 2012). The Centers for Disease Control and Prevention (CDC) estimates that 35.1 percent of adult Americans are obese and an additional 33.9 percent are overweight (CDC, 2014). Overweight and obese individuals risk suffering from coronary heart disease, Type 2 diabetes, cancer, hypertension, dyslipidemia, stroke, liver and gallbladder disease, sleep apnea and respiratory problems, osteoarthritis, and gynecological problems (National Institute of Health (NIH), 2000). Researchers estimate obesity-related healthcare costs at \$147 billion in 2008 (Finkelstein, Trogon, Cohen, & Dietz, 2009).

U.S. health care organizations and clinicians are challenged to fully implement obesity guidelines (Felix, West, & Bursac, 2008; Strategies to Overcome and Prevent Obesity (STOP) Alliance, 2010). Numerous robust clinical guidelines are available. The National Heart, Lung, and Blood Institute (NHLBI) in cooperation with the NIH published the first federal clinical obesity guidelines in 1998. This guideline recommended a two-step process: determination of risk status and motivation to lose weight, followed by treatment management (NHLBI, 1998; NIH, 2000; Schuster, Tasosa, & Terwoord, 2008). In 2013, the American College of Cardiology, American Heart Association, and The Obesity Society released an update of this guideline (Jensen et al, 2013). The United States Preventive Services Task Force (USPSTF) released clinical guidelines in 2003. The updated 2012 USPSTF guideline advocates screening all adult patients for obesity and offering intensive, multicomponent behavioral interventions to all obese patients (USPSTF, 2012). The first edition of the Institute for Clinical Systems Improvement (ICSI) *Prevention and Management of Obesity for Adults* Guideline was published in 2004 with its sixth edition released in 2013 (Figure 1). The ICSI guideline recommends addressing obesity with patients using a combination of two approaches, the 5As framework and motivational interviewing. The 5As framework consists of five components: Ask, Advise, Assess, Assist, and Arrange. *Ask* refers to screening (annually and as needed). *Advise* is a patient-centered conversation regarding risks of obesity and benefits of a healthy lifestyle. *Assess* refers to

determining readiness for change. *Assist* refers to helping the patient set goals. *Arrange* refers to scheduling follow-up appointments (Fitch et al., 2013). Research shows that this framework facilitates individual as well as system-level behavior change (Glasgow, Goldstein, Ockene, & Pronk, 2004). Motivational interviewing, a behavioral counseling method originally developed for the addictions field and shown effective for weight loss, is adaptable to the primary care setting (Armstrong, Mottershead, Ronksley, Sigal, Campbell, & Hemmelgarn, 2011; Fitch et al., 2013; Hall, Gibbie, & Lubman, 2012).

The successful translation of any evidence-based clinical guideline requires system-level adaptations in addition to changes by individual health care professionals (Ploeg, Davies, Edwards, Gifford, & Miller, 2007). According to Keller, Strohschein, Lia-Hoagberg, and Schaffer, "Population-based system-focused practice changes organizations, policies, laws, and power structures. The focus is on the systems that impact health, not directly on individuals and communities" (2004, p. 457). Examples of system-level adaptations that support the implementation of clinical obesity guidelines include:

- Designation of a person or department responsible for timely implementation and monitoring (Poobalan, Aucott, Ahmed, & Smith, 2010).
- Incorporation of quality improvement systems such as chart prescreening, risk assessment forms, prompts, flow-sheets, reminder/recall systems, patient education materials and/or redistributing responsibilities among office staff (Bordley, Margolis, Stuart, Lannon, & Keyes, 2001; Krist et al., 2008; Schriefer, Landis, Turbow, & Patch, 2009).
- Selection of a uniform protocol such as the 5As for describing, delivering, and evaluating health behavioral counseling interventions (Goldstein, Whitlock, & DePue, 2004; Jay et al., 2010).
- Integration of staff into practice teams (Pimlott, 2008). In larger settings, teams consist of multiple disciplines including physicians, nurse practitioners, physician assistants, nurses, medical assistants, health educators, behavioral health counselors, pharmacists, and/or other office staff, while in smaller settings teams consist of a clinician and perhaps one other member (Bodenheimer, 2007).
- Development of counseling skills via interactive, step-based continuing education learning opportunities during workshops, small groups, and/or individual training sessions (Davis, O'Brien, Freemantle, Wolf, Mazmanian, & Taylor-Vaisey, 1999).
- Utilization of an implementation process tailored to the practice (Baskerville, Liddy, & Hogg, 2012; Ploeg et al., 2007).
- Adoption of a comprehensive worksite wellness policy that supports clinician health. Normal weight physicians and nurses are more apt than their overweight counterparts to address obesity with their patients (Zhu, Norman, & While, 2011).

Superior outcomes result when multiple individual- and system-level changes occur simultaneously (Derksen, Brink-Melis, Westerman, Dam, Seidell, & Visscher, 2012; Gowin, Avonts, Horst-Sikorska, Dytfeld, & Michalak, 2012).

Health risks related to obesity make decreasing the high prevalence of obesity a public health priority (Health and Human Services, 2010). Both the Institute of Medicine (2012) and the Affordable Care Act (Community Benefit, 2014) encourage cooperative and collaborative partnerships between public health, primary care, and other community partners. Neither one, however, addresses the role or potential role that public health plays in the arena of collaborative clinical obesity guideline implementation.

Research regarding guideline implementation supports the role of the practice facilitator, finding that nurses are effective practice champions for preventive health services within their respective health care setting (Baskerville et al., 2012; Holtrop et al., 2009). In a system-level obesity prevention and management intervention, a public health nurse (PHN) acted as practice facilitator of a system-level intervention, translating clinical obesity guidelines within public health, primary care, and other health care settings. This article reports measurement and outcomes evaluation of the study. Clinician perspectives regarding reasons for translation success are reported elsewhere (Monsen et al., 2014). The purposes of this study were 1) to evaluate the extent of guideline translation across organizations and 2) to assess the Omaha System as a method for translating system-level interventions and measuring outcomes.

Methods

Design

A university-community research team conducted this retrospective, mixed methods research. This study was approved by the institutional review boards and leadership of the University of Minnesota and local public health departments in Becker, Clay, Otter Tail, and Wilkin counties in Minnesota. Study participants consented to interviews.

Intervention Description

Four rural Midwestern United States county-level public health departments conducted a local assessment and discovered rising aggregate obesity rates from 25.2 percent in 2004 to 29.4 percent in 2010, exceeding the 2010 state average of 24.8 percent (CDC, 2013). These four public health departments received state funding to address obesity through policy, system, and environmental interventions in health care, worksites, communities, and schools. From a menu of options, they chose to promote the translation of the ICSI *Prevention and Management of Obesity for Adults Guideline* into clinical practice (Fitch et al., 2013). To achieve that goal, they assigned the role of intervention practice facilitator to a PHN from one of the agencies.

In 2010, the PHN practice facilitator recruited partners from healthcare organizations in the four-county region by fax, email, telephone, and face-to-face conversations with administrators and quality improvement personnel. In total, she recruited five primary care clinic partners and five additional health care partners (four county-level public health

agencies and one independent physical and occupational therapy (PT/OT) clinic). Partners represented two major health care systems, a migrant health service, and a federally qualified health care center. Most partners served rural areas (70 percent) and received public funding (60 percent). Each partner organization selected a physician/director champion to lead an interprofessional team consisting of representation from at least 2–3 of the following areas: nursing, dietetics, physical therapy, quality improvement, information technology, and coding and billing.

In the first twelve months, ICSI consultants and PHN practice facilitator led partners in a learning collaborative utilizing face-to-face and web-based interactive trainings. Partners learned about the obesity guideline, organizational readiness to change, quality improvement strategies, adaptive leadership, patient-centered and patient-empowering conversational style and spirit (motivational interviewing), as well as how to develop an action plan with measurable aims. The consultants and PHN practice facilitator-elicited end-user input to guide the creation of site-specific action plans based on a generic menu of aims and measures encouraging policy, system, and environmental (PSE) changes. The generic menu and sample action plan are available on-line (Thorson, et al, 2014). Partner organizations incorporated system-level interventions such as the following into quarterly action plans:

- Designation of a champion and a multidisciplinary team responsible for guideline implementation,
- Facilitation of interprofessional training regarding the guideline, adaptive challenges, and motivational interviewing,
- Relocation of scales to private locations and placement of working stadiometers conducive to work flow to facilitate body mass index (BMI) screening,
- Development of a team approach to efficiently and effectively deliver the 5As,
- Addition of prompts and reminders to the medical record system,
- Integration of obesity-related teaching tools and resources (body mass index brochures, patient action plan template, food /activity logs, portion control plates/handouts, home exercise routines, calorie counters, clinic/community resource brochures, and food and fat models) into the patient visit,
- Development of electronic tracking systems for panel or population management,
- Adoption and implementation of employee wellness initiatives or worksite wellness policies.

The consultants held conference calls and webinars to provide follow-up and support, and to conduct evaluation.

Following the initial 12-month intervention, the PHN practice facilitator met quarterly with each partner organization to assess action plan progress and barriers to success, and to offer guidance and resources supportive of guideline implementation. The PHN practice facilitator applied the 5As framework to her system-level facilitation activities: *Ask* refers to screening partner agency for obesity/overweight protocol and worksite wellness initiative/policy.

Advise refers to advising partner agency of screening results and implications. *Assess* refers to assessment of partner agency's readiness to change. *Assist* refers to helping partner agency with goal-setting, action plan creation, and connecting to resources. *Arrange* refers to scheduling follow-up meetings to review action plan progress, address barriers and update action plan. The expanded version of the 5As framework used by the PHN Practice Facilitator, as well as the intervention timeline, is available on-line (Thorson et al., 2014).

Sample

Study participants ($n=39$) comprised a convenience sample from the ten partner sites consisting of an administrator from each site ($n=10$), three clinicians from nine of the ten sites and two clinicians from one site ($n=29$). Clinicians included twelve PHNs, five registered nurses, four nurse practitioners, two physicians, two physician assistants, and one each of the following: registered dietitian, physical therapist, occupational therapist, and physical therapy assistant. A research assistant conducted interviews over a 6-month period between October 2012 and April 2013.

Measure and Analytical Strategy

The research team used the Omaha System to document systems-level practice and measure outcomes (Martin, 2005). The Omaha System Intervention Scheme describes health care interventions using a hierarchy of defined actions and targets. The PHN practice facilitator developed an evidence-based care plan for practice facilitation based on the ICSI guideline using the Intervention Scheme. Based on the Omaha System sign/symptom "inadequate treatment plan," she chose the Omaha System Problem *Health care supervision*, defined as the "management of health care treatment by health care providers" (Martin, 2005, p. 346–347). This care plan is available on-line (Thorson et al., 2014).

The Omaha System Problem Rating Scale for Outcomes consists of three five-point Likert-type ordinal scales for measuring the range of severity for the dimensions of Knowledge, Behavior, and Status (KBS) relative to each problem. In measuring system-level outcomes, the challenge is to define whose knowledge, behavior, and status is measured. For this study, we interpreted organizational change through measuring organizational knowledge, behavior, and status as reported by an outside observer (PHN facilitator) as well as participants who were administrators or clinicians within the organizations. In this intervention, Knowledge refers to "knowledge related to the content of the clinical obesity guideline," and outcomes range from "no knowledge" to "superior knowledge." Behavior refers to the "implementation of the clinical obesity guideline," and outcomes range from "never implementing" to "consistent implementation." Status refers to the "adoption of the clinical obesity guideline," and outcomes reflect a continuum from "no adoption (extreme signs/symptoms)" to "generalized adoption (no signs/symptoms)." The KBS rating guidance developed for this intervention is available on-line (Thorson et al., 2014). The PHN practice facilitator assigned KBS ratings to each partner organization pre-intervention (baseline) and at the three-year point of the intervention (follow-up). The researchers selected a rating of three as the outcome benchmark for the three outcome dimensions of Health Care Supervision.

A single independent interviewer conducted semi-structured interviews with participants, beginning at the three-year point of the intervention. To obtain partner organization self-KBS ratings from participants, the interviewer asked clinicians to rate themselves, and the administrators to rate the organization, regarding the translation of the ICSI adult clinical obesity guideline. The researchers abstracted KBS ratings from the interview transcripts. Comparison of numeric results with the interview narratives to aggregated KBS ratings enabled assessment of the validity of the Omaha System Problem Rating Scale for Outcomes results.

Descriptive analysis of KBS ratings included comparisons of baseline, follow-up, and change scores. The percentage of agreement across raters for each organization evaluated benchmark attainment. Intraclass Correlation (ICC) analysis compared the judgments of the raters (PHN practice facilitator, administrators, and clinicians) respective to each setting (Landis & Koch, 1977). A nested analysis pair-by-pair comparison of the PHN practice facilitator rating with administrator and clinician ratings adjusted for random error (Koch, 1982).

Results

This study aimed to evaluate the extent of guideline translation across organizations. Outcome Analysis revealed that on a scale of 1 to 5 (1 = low/negative; 5 = high/positive), the average KBS ratings across partner organizations increased over two points from baseline to three year follow-up. Knowledge ratings increased from 1.20 (no knowledge) to 3.32 (basic knowledge). Behavior ratings increased from 1.10 (not appropriate) to 3.56 (between inconsistently – consistently appropriate). Status ratings increased from 1.10 (extreme signs/symptoms) to 3.85 (minimal signs/symptoms) (Table 1).

Nine out of ten organizations attained average KBS benchmarks of 3 and seven organizations attained a Status benchmark of 4. The percentage of agreement regarding benchmark attainment (rating 3) was 83.9 percent (K), 91.1 percent (B), and 89.4 percent (S). Knowledge benchmark attainment showed substantial agreement, while Behavior and Status benchmark attainment showed moderate agreement (Table 2).

Comparison of PHN practice facilitator observed follow-up ratings and partner self-reported follow-up ratings revealed that partner ratings were slightly lower on average for Knowledge (3.90 vs. 3.18) and higher on average for Behavior (3.00 vs. 3.70) and Status (2.80 vs. 4.13) (Table 1 and Figure 2). The ICC analysis demonstrated moderately strong agreement for Knowledge and weaker agreement for Behavior and Status (Table 3).

Responses to semi-structured interview questions aided in interpreting these findings: the participant comments matched general trends in Omaha System documented practice ratings. References to information and education revealed an increase in guideline-related knowledge:

We've had three of us that have gone to ICSI's Collaborative meetings that we have done, and we have also participated in on-site and webinar information through

ICSI, and through [the collaborative quarterly meetings with the PHN]...I think each of those have given information to help us get to where we're at right now.

You know, the [collaborative was] very supportive - they've given us a lot of education, they've given us a lot of resources, just kind of organized that information for us, supported our staff, sharing best practices among other clinics with us, which we have found to be very valuable.

Other statements illustrated an increase in guideline-related behavior:

I think, when I first started out with [the collaborative], I thought, "This was such a huge task, how do you even begin to chip away at it?" But, as I look back, we are making differences...all these little changes, I think, are really making a big difference. And because [the collaborative] got us going, I think it's making a difference. I think we have a long ways to go.

...because we've had [the PHN] coming, checking in with us, and reminding us of things, and reviewing previously set goals, and assisting us in setting future goals...it's helped us stay on track, and it's helped us continue to be mindful of the process.

Additional comments highlighted an increase in guideline-related status:

We have embedded this in all of our client records, so that that becomes part of our conversations over either one visit or multiple visits during the time that we know them. It's our policy that those be assessed and recorded.

So before...it would not necessarily be addressed, but because of the fact that it's now our agency policy that we address nutrition, physical activity, and substance use on every single client that we see...OK, so I mean...it's right up front, and it's in your face, and you do that.

Participants also described reasons for successful guideline translation, reported separately (Monsen et al., 2014).

This study also aimed to assess the Omaha System as a method for translating system-level interventions and measuring outcomes. The guideline translation care plan, KBS rating guide, and study findings demonstrate the utility of the Omaha System at the system-level for intervention description and outcome measurement.

Discussion

A PHN-facilitated interprofessional system-level translation of the ICSI adult obesity guideline into clinical practice resulted in increased Knowledge, Behavior, and Status ratings, demonstrating effectiveness of the intervention. The magnitude of the increase was consistent with a large effect size (Johnson, McMorris, Raynor, & Monsen, 2013). This innovative PHN-facilitated collaboration between public health and partner organizations across the multi-faceted health care system demonstrates successful partnership between public health, primary care, and other health care organizations regarding obesity management.

The collaborative effort intentionally broadened the definition of a clinical guideline implementation setting beyond a primary care setting. This strategy enabled implementation of the ICSI guideline in public health departments and an independent physical/occupational therapy clinic as well as in traditional primary care settings. Furthermore, it increased the guideline scope, making possible a more comprehensive and systematic population-level approach to obesity across multiple health care delivery settings.

The Omaha System Care Plan successfully described the system-level intervention. The PHN considered each health care organization as the client and used the care plan to document system-level work that focused on system-level changes. This novel use of the Omaha System guided system-level practice, captured system-level interventions, and measured system-level outcomes, effectively managing system-level practice and outcomes. Future interventions using the Omaha System at the system-level should integrate policy, system, and environmental elements into the Omaha System Care Plan in a manner that facilitates reporting requirements related to funding reports or administrative requirements. Further research should examine patient-level outcomes in relationship to system-level outcomes as well as evaluate other ways to measure and validate system-level outcomes, such as chart audits or population health indicators that show improvement relative to the observed organizational changes.

This study had limitations common to observational studies and convenience samples. Administrator, facilitator, and clinician ratings of Knowledge, Behavior, and Status reflect each person's perspective and inherent bias. Without randomization or use of a control group, researchers cannot assign causation for changes in guideline knowledge and use. However, participants reported reasons for successful guideline implementation (Monsen et al., 2014). Furthermore, the lengthy intervention increased the possibility of other factors influencing intervention success. Future studies should address these methodological issues. This is the first study that has compared observer ratings to self-ratings. Subsequent research should develop methods for validating observational data in clinical settings.

The National Public Health Performance Standards Program directs public health to ensure a competent workforce through capacity-building opportunities (CDC, 2008–2013; Internal Revenue Service, 2013). This study demonstrates the development of public health nurses as practice facilitators in health care settings other than public health, and suggests that there is potential for public health to implement clinical obesity guidelines within public health programs such as Women, Infants and Children (WIC), the Nurse-Family Partnership (NFP), and Minnesota Senior Health Options (MSHO).

Conclusions

System-level PHN practice facilitator interventions successfully translated clinical obesity guidelines into interprofessional use in health care organizations. The Omaha System KBS outcome ratings provided reliable data to measure system-level outcomes. This research contributes to best practice recommendations related to the interprofessional translation of clinical adult obesity guidelines into reality across diverse and numerous health care settings. In addition, it demonstrates potential for use of the Omaha System as a means of

guiding and evaluating system-level interventions, and paves the way for intentional collaborative partnerships between public health, primary care, and other community health care partners.

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Figure 1.

Institute for Clinical Systems Improvement (ICSI) *Prevention and Management of Obesity for Adults* Guideline Algorithm

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Source:

Fitch, A., Everling, L., Fox, C., Goldberg, J., Heim, C., Johnson, K., Kaufman, T., Kennedy, E., Kestenbaun, C., Lano, M., Leslie, D., Newell, T., O'Connor, P., Slusarek, B., Spaniol, A.,

Stovitz, S., & Webb, B. (2013). Prevention and management of obesity for adults. Updated May 2013. Institute for Clinical Systems Improvement, p.1.

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Figure 2.

Average Baseline and Follow-up (33–39 months from baseline) Omaha System Outcome Ratings by Public Health Nurse Practice Facilitator ($n = 1$), Administrator ($n = 10$), Clinician ($n = 29$), and Organization ($n = 10$).

PHN = Public Health Nurse

Source: Table 1 Data

Table 1.

Average, Range and Standard Deviation related to Omaha System Outcome Ratings by Public Health Nurse Practice Facilitator (n=1), Administrator (n=10), Clinician (n=29), and Partner Organization (n=10) at Baseline and Follow-up (33–39 months from baseline)

Baseline or Follow-up Rating	Rater	Omaha System Outcome Ratings								
		Knowledge			Behavior			Status		
		Average	Range	S.D.	Average	Range	S.D.	Average	Range	S.D.
Baseline	PHN Facilitator	1.20	1.00–3.00	0.63	1.10	1.00–2.00	0.32	1.10	1.00–2.00	0.32
Follow-up	PHN Facilitator	3.90	3.00–5.00	0.74	3.00	2.00–4.00	0.82	2.80	2.00–4.00	0.63
	Administrator	3.30	2.00–4.00	0.67	3.40	2.00–4.00	0.84	3.57	1.00–5.00	1.30
	Clinician	3.15	2.33–5.00	0.76	3.80	3.33–4.00	0.28	4.27	3.00–5.00	0.60
	Organization	3.18	2.50–4.75	0.62	3.70	3.00–4.00	0.35	4.13	2.50–4.67	0.65
	All	3.32	2.60–4.60	0.55	3.56	2.80–4.00	0.37	3.85	2.50–4.67	0.60

S.D. = Standard Deviation; PHN = Public Health Nurse

Table 2.

Percent Agreement Met (Rating of 3 to 5) and Unmet (Rating of 1 to 2) between Public Health Nurse Practice Facilitator ($n=1$), Administrator ($n=10$) and Clinician ($n=29$) for Omaha System Follow-up Outcome Ratings and Cohen's Kappa Adjusted for Random Agreement and Corresponding Landis and Koch Guideline.

Outcome Rating Concepts	Percent Agreement in Follow-up Ratings between PHN Practice Facilitator, Administrators, and Clinicians					Adjusted Cohen's Kappa	Landis and Koch Guideline
	Administrators	First Clinician from each agency	Second Clinician from each agency	Third Clinician from each agency	Total		
Knowledge	90%	80%	60%	89%	82%	0.64	Substantial Agreement
Behavior	70%	78%	67%	67%	70%	0.41	Moderate Agreement
Status	80%	70%	70%	78%	77%	0.54	Moderate Agreement

PHN = Public Health Nurse

Table 3.

Intraclass Correlation for Omaha System Follow-up Outcome Ratings by Paired Raters: Administrator ($n=10$), Clinician ($n=29$), and Public Health Nurse Practice Facilitator ($n=1$).

Paired Raters	ICC Omaha System KBS Outcome Ratings		
	Knowledge	Behavior	Status
Administrator - Clinician	0.53	0.46	0.35
PHN Practice Facilitator - Administrator	0.63	0.46	0.31
PHN Practice Facilitator - Clinician	0.53	0.46	0.44

ICC = Intraclass Correlation; KBS = Knowledge, Behavior, and Status; PHN = Public Health Nurse