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Efficacy of a Health Insurance Literacy Intervention: A Retrospective Pretest Assessment of Knowledge Acquisition and Gained Confidence for Center for Independent Living Staff

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Abstract

In the United States, health insurance is important for adults with disabilities, who make up nearly 30% of the general population. A national network of publicly-funded programs called Centers for Independent Living (CILs) provide a wide range of services to persons with disabilities (called "consumers). CIL staff, however, lack training on assisting consumers in their health insurance selections. This study used the ADDIE Model and iPAT to develop a health insurance training curriculum for CIL staff. Using a Retrospective Pretest design, the study assessed health insurance knowledge acquisition and self-confidence increases using the training content. Cohort 1 consisted of 61 adult CIL staff that participated in one of three web-based real time trainings and Cohort 2 consisted of 83 adult CIL staff that participated in one of two on-demand video trainings. Post-retrospective data for each module were collected using a participant Knowledge and Self-Confidence Questionnaire and confidence intervals were calculated based on non-paired group means for each module. A process evaluation measure assessed relevancy of the training, usefulness of content, materials quality, and trainer quality and group means were calculated. Results showed statistically significant increases for both cohorts and high process evaluation scores. Limitations of the study include the use of a convenience sample, differential cohort sizes and attrition rates, and the use of unweighted evaluation criteria. Nevertheless, the study suggests the importance of more focused attention on educating disability organization staff and the feasibility of combining ADDIE and iPAT methodologies to address the needs of persons with disabilities.

Keywords: disability, participatory action training, education, health insurance

1. Introduction

1.1 Role of Health Insurance

In the United States (U.S.), health insurance usually falls into two categories; private or public health insurance. Private health insurance can be purchased individually or is provided through an employer, while public health insurance includes publicly funded Medicaid and Medicaid Expansion health insurance programs for low-income persons and Medicare for persons 65 and older (Drum et al., 2023). Evidence from systematic reviews and other research has established that private and public health insurance coverage increases access to primary and secondary health services (Keisler-Starkey et al., 2023). In turn, receipt of primary and acute medical care is linked with improved health outcomes, including the prevention of illness and death, reduction of health disparities, and improvement in quality of life (Fan et al., 2024; Olaisen, et al, 2020). Access to secondary health services, including general preventive screenings, gender-specific screenings, immunizations, and health behavior assessments, also contribute to better health outcomes such as living longer, avoiding disease, and being healthier and more productive (Crittenden & Fang, 2021; Dore et al., 2024).

Whether health insurance is public, private, or universal as in many international countries, health insurance coverage is an important linchpin to accessing care that improves health, morbidity, and mortality. In turn, health insurance literacy (HIL), the ability to effectively choose and use health insurance, is relatively understudied both internationally (e.g., Bardy, 2023, 2024; Barnes & Hanoch, 2017; Holst, et al., 2022) and within the United States (Yagi, et al., 2021). While HIL has been linked to more effective health care utilization, there is a paucity of studies that have examined the impact of health insurance literacy among adults with disabilities. In one exception, Park & Stimpson (2024) found that a lack of HIL among persons with disabilities was a significant contributor to unmet needs for medical care using data from the 2010-

2019 Medicare Current Beneficiary Survey (MCBS). In a systematic review on the relationship between health insurance literacy and health care utilization in United States conducted by Yagi and colleagues (2021), 21 studies were included and only one included adults with disabilities, although defined narrowly as "the chronically ill." Importantly, only three of the Yagi, et al., studies included in the systematic review were interventions studies.

Several studies have focused on increasing the health insurance literacy of general populations both in the U.S. and internationally. For example, Politi and colleagues (2016) an online health insurance decision support tool called *Show Me My Health Plans* that demonstrated effectiveness. The *Smart Choice Health Insurance©* is a consumer education program that showed statistically significant increases in health insurance literacy and confidence (Brown, et al., 2016). Instead of a general population, the Improving Cancer Patients' Insurance Choices (*I Can PIC*) created a web-based health insurance decision aid for cancer patients that resulted in increased health insurance literacy and confidence (Politi, et al., 2020). Other studies have examined the HIL levels of information intermediators in providing health insurance information to their consumers and found low levels of HIL for insurance navigators, community health workers, and others in outreach roles (Edward, Thompson, Wiggins, 2022) and moderate HIL scores among community health center staff (Williams, Pensa, & Olson, 2021). A review of literature since 2020 does not, however, reveal any intervention studies that specifically exam the efficacy of using disability organization staff as health insurance information intermediators for community-dwelling adults with disabilities.

1.2 Disability Prevalence & Services

HIL is particularly important among marginalized populations such as adults with disabilities. According to the Centers for Disease Control and Prevention [CDC] (2024a), 28.7% of the non-institutionalized adult population or over 73 million persons report having a disability. The population is likely larger since the CDC's Behavioral Risk Factor Surveillance System survey data has been found to undercount certain types of disabilities (Hall et al., 2022; Varadaraj et al., 2021). Adults with disabilities experience a range of systemic barriers in health care, including dissatisfaction with received health care (Iezzoni et al., 2022) and disparities in health outcomes compared to non-disabled populations (CDC, 2024b). These findings emphasize the importance of choosing and using public and private health insurance effectively.

Since 1973, a national network of federally-funded programs called "Centers for Independent Living" (CILs) have provided a wide range of services to non-institutionalized adults with disabilities. The purpose of the CIL program is to support the independence, integration, and inclusion of persons with disabilities in American society (Administration for Community Living [ACL], 2024). CILs are community based, cross-disability designed, and controlled and operated by a majority of persons with disabilities. CIL staff provide five core services to persons with disabilities (often defined by CILs as "consumers"), including peer counseling, information and referral; independent living skills training; individual & systems advocacy; and services that facilitate life transitions (ACL, 2024). The CIL network includes over 400 CILs and more than 300 branch offices that served 236,881 people with disabilities in 2020 according to the latest available data (National Council on Independent Living [NCIL], 2024). Yet, the ability of CIL staff to provide information and peer counseling to consumers about public and private health insurance to consumers by CIL staff is limited due to a lack of knowledge and training (Frieden & Zarutskie, 2024).

1.3 Study Aims

The primary aim of the Health Insurance Literacy Academy (HILA) Project was to develop and evaluate the efficacy of a disability-centered health insurance literacy training program for CIL staff in providing consumers with actionable information on health insurance selection. Building off existing definitions of health literacy (e.g., Liu et al., 2020), we defined health insurance literacy for this study as having the skills, knowledge, and ability to make effective insurance choices and provide direction to consumers on how to choose and use health insurance successfully.

Two research questions were developed for the study:

1. Do CIL staff demonstrate an increase in their knowledge of public and private health insurance after participating in a HILA training program?
2. Do CIL staff demonstrate an increase in their self-confidence with using training content with consumers after participating in the HILA training program?

The study also conducted process evaluation that assessed participant perspectives on the relevancy of the training, usefulness of the training content, quality of the training materials, and quality of the trainers.

2. Methods

2.1 Study Design

The HILA Project used the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) Model and participatory action principles (PAR) to develop the health insurance literacy training curriculum for CIL staff. The

ADDIE Model is an iterative instructional process consisting of five phases to develop that include: 1) Analysis; 2) Design; 3) Development; 4) Implementation; and 5) Evaluation. The Analysis Phase includes defining the instructional problem and broader instructional goals and assessing the level of knowledge and skills of potential trainees. The Design Phase involves identifying specific instructional objectives and training content, structure, and layout of the instructional curriculum. During the Development Phase specific content is drafted and assembled into a training curriculum. The Implementation Phase includes the pilot testing of the training content. Evaluation occurs continuously throughout each phase (Crompton et al., 2024). In addition, participatory action principles informed the development of the HILA training program (see section 2.3, below). The piloted HILA curriculum included four modules (see 2.2.1-2.2.4 below).

A Retrospective Pretest (RPT) (or post-then-pre) methodology (Hwalek et al., 2024) was used to address the study's research questions. Following the RPT design, after CIL staff participated in each of the four training modules, participants were asked their level of knowledge of key informational points and confidence using the knowledge before and after the training (see Table 1). Process evaluation questions were also asked after each module regarding the utility of the module and satisfaction with the trainers.

2.2 Sample & Participants

The study participants were recruited through a convenience sample using email invitations issued by two CIL national associations, the National Council on Independent Living and the Association of Programs in Rural Independent Living. Participants were required to be current adult staff of CILs who were able to consent to participate in the training as part of the inclusion criteria. Exclusion criteria included missing or incomplete consent forms to participate in the training. Cohort 1 consisted of 61 persons who participated in a web-based real time HILA training events. Cohort 2 consisted of 83 adult CIL staff that participated in an on-demand video HILA training program.

2.3 Procedure

We recruited an integrated participatory action training (iPAT) expert panel that included CIL staff, persons with disabilities, health insurance specialists, and health researchers to inform each ADDIE phase, including training results. Similar to participatory action research – which brings together community members, content experts, and researchers to co-create new knowledge (Cornish, et al., 2023) – we define iPAT as a facilitated process that reflects the perspectives, experiences, and expertise of the iPAT group that ultimately results in the co-creation of a training program. This includes seeking input and consensus on instructional problems and goals, learning objectives, content, and evaluation strategies, and may include shared implementation responsibilities. HILA Project staff had initial responsibility for drafting training and evaluation content before review by the iPAT group. Initially, three training modalities were planned (in-person, real time webinar, and on-demand webinar), however, due to COVID-19 pandemic restrictions, in-person training events were removed from the study. The HILA training was designed to provide CIL staff with the knowledge and confidence to effectively communicate with persons with disabilities about choosing and using health insurance (i.e., health insurance literacy).

After receiving Institutional Review Board approval, we issued invitations to CIL staff in the U.S. to participate in training events through the list servs of the American Association on Health and Disability (where the project was based), and the National Council on Independent Living and the Association for Programs in Rural Independent Living, two national disability organizations that provide support to CILs. Participants were a convenience sample of CIL staff who attended either the real-time or on-demand webinar and signed an informed consent form prior to the training. Cohort 1 consisted of a total of 61 persons that enrolled in one of three separate real-time training events offered by the HILA Project. Cohort 2 consisted of 83 CIL staff that enrolled in one of the two on-demand trainings offered by the project.

The training sessions were co-led by two iPAT group members who presented HILA training content and facilitated question and answer (Q and A) discussions in the live sessions. The final training curriculum included four modules scheduled for one hour each for real-time events. A recorded version by one iPAT trainer was made available to enrolled CIL staff for self-paced learning during two 2-month access periods. A mock Q and A discussion was recorded for the on-demand HILA training webinar. In addition to the training, participants received a copy of the training curriculum (including a summary of communication strategies not discussed in the training), a health insurance vocabulary handout, and a copy of the HILA training PowerPoint. All materials were provided in accessible formats. Appendix A contains the HILA training curriculum (described below) and the HILA Outcome and Process Evaluation Measures.

HILA Training Module 1: Introduction to Health Insurance

In Module 1, the HILA training began with a discussion of the purpose and development of the HILA curriculum, the importance of health insurance, what health insurance usually covers, and basic and advanced health insurance vocabulary. The goal of this module was to provide a broad overview of health insurance and begin preparing CIL staff to provide health insurance information to consumers (Drum, et al., 2023).

2.3.1 HILA Training Module 2: Types of Health Insurance

Module 2 begins with a summary of the names of medical providers and organizations affected by health insurance and then provides an overview of private and public health insurance and their pros and cons, including a summary of the Affordable Cate Act (ACA) that expanded public health insurance. The goal of the module was to provide more specific information on health insurance to the trainees (Drum, et al., 2023).

2.3.2 HILA Training Module 3: A Guide to Choosing Insurance

Module 3 moves from providing information on health insurance to assisting trainees in how to apply their new-found knowledge by using comparison guides with consumers to help CIL staff confidently facilitate insurance choices (Drum, et al., 2023).

2.3.3 HILA Training Module 4: Hurdles to Using Health Insurance

Module 4 focuses on providing an overview to trainees of common barriers to using health insurance and strategies to overcome them that can be provided to consumers. It includes information to share on how to appeal denials of insurance claims and how consumers can effectively communicate with health care providers. The goal of this module is to combine trainee knowledge with strategies to encourage action by consumers (Drum, et al., 2023).

2.4 Measures

Table 1. Knowledge and Self-Confidence Learning Objective Questions by Module

Module 1- Level of Knowledge (Before/After)
-What is your level of knowledge of the importance of health insurance [BEFORE/AFTER] the training session? -What is your level of knowledge of what health insurance covers [BEFORE/AFTER] the training session? -What is your level of knowledge of basic and advanced health insurance terms [BEFORE/AFTER] the training session?
Module 1- Level of Confidence (Before/After)
-What was your level of confidence in using information about the importance of health insurance [BEFORE/AFTER] the training session? -What was your level of confidence in using information about what health insurance covers [BEFORE/AFTER] the training session? -What was your level of confidence in using information about basic and advanced health insurance terms [BEFORE/AFTER] the training session?
Module 2- Level of Knowledge (Before/After)
-What was your level of knowledge of the names of medical providers and organizations connected to health insurance [BEFORE/AFTER] the training session? -What was your level of knowledge of the different kinds of private health insurance and their pros and cons [BEFORE/AFTER] the training session? -What was your level of Knowledge of the characteristics of public health insurance programs [BEFORE/AFTER] the training session? -What was your level of knowledge of the goals of the Affordable Care Act (ACA) and the 10 essential health benefits [BEFORE/AFTER] the training session?
Module 2- Level of Self-Confidence (Before/After)
-What was your level of confidence in using information about the names of medical providers and organizations connected to health insurance [BEFORE/AFTER] the training session? -What was your level of confidence in using information about different kinds of private health insurance and their pros and cons [BEFORE/AFTER] the training session? -What was your level of confidence in using information about the characteristics of public health insurance programs [BEFORE/AFTER] the training session? -What was your level of Confidence in using information about the goals of the Affordable Care Act (ACA) and the 10 essential health benefits [BEFORE/AFTER] the training session?
Module 3- Level of Knowledge (Before/After)
-What was your level of knowledge of the "If/Then" process to better understand why people with disabilities need insurance and challenges in obtaining health insurance [BEFORE/AFTER] the training session? -What was your level of Knowledge of how to use the 3 Health Insurance Comparison Guides [BEFORE/AFTER] the training session?
Module 3- Level of Self-Confidence (Before/After)
-What was your level of confidence in using the "If/Then" process to better understand why people with disabilities need insurance and challenges in obtaining health insurance [BEFORE/AFTER] the training session? -What was your level of Confidence in using information about the 3 Health Insurance Comparison Guides [BEFORE/AFTER] the training session?
Module 4- Level of Knowledge (Before/After)
-What was your level of knowledge of the common barriers to using health insurance and strategies to overcome the barriers [BEFORE/AFTER] the training session? -What was your level of knowledge of ways to appeal denials of health claims and your ability to share this information [BEFORE/AFTER] the training session? -What was your level of knowledge of patient activation as a tool for Insurance Users [BEFORE/AFTER] the Session?
Module 4- Level of Self-Confidence (Before/After)
-What was your level of confidence in using information about the common barriers to using health insurance and strategies to overcome the barriers [BEFORE/AFTER] the training session? -What was your level of confidence in using information about ways to appeal denials of health claims and your ability to share this information [BEFORE/AFTER] the training session? -What was your level of confidence in using information about patient activation as a tool for Insurance Users [BEFORE/AFTER] the training session?

Table 1 summarizes each module's before and after outcome questions based on learning objectives (see also Appendix A). Knowledge and Self-Confidence Measure items were developed based on each module's learning objectives, e.g., "What was your level of knowledge of the importance of health insurance BEFORE the training session" followed by "What was your level of knowledge of the importance of health insurance AFTER the training session." A four-point Likert scale was used for response options where 1 = None (have no knowledge of the content); 2 = Low (know very little about the content); 3 = Moderate (have basic knowledge; there is more to learn); and 4 = High (consider myself very knowledgeable). A similar question format and scale was used to assess confidence levels, e.g., "What was your level of Confidence in using information about the importance of health insurance BEFORE the training session?" and "What was your level of Confidence in using information about the importance of health insurance AFTER the training session?"

The study also developed a process evaluation measure deployed after the completion of each module. Participants were asked to assess four different evaluation criterion, including 1) *relevancy* of the training, 2) *usefulness* of the training content, 3) *quality* of the training materials, and 4) *quality* of the trainers (see Table 2). For each process evaluation criterion, the scale was: 1 = Very Poor; 2 = Below Average; 3 = Average; 4 = Above Average; and 5 = Excellent.

The Knowledge and Self-Confidence outcomes and process evaluation measures (see Table 1 and Appendix A) were developed based on a valid and reliable checklist of evaluative criteria created by Francis and colleagues (2016) that evaluates the strengths and weakness of self-report measures and suitability for specific interventions. Each of the Francis, et al., checklist domains (conceptual model, content validity, reliability, construct validity, scoring and interpretation, and respondent burden) were used as the basis for an intensive review and endorsement by the project's expert panel (the iPAT panel) of the quality and appropriateness of the HILA outcome and process evaluation measure items. These domains laid out by Francis and colleague (2016) are 1) the conceptual model that provides the rationale for the measure and the populations it is intended to assess, 2) content validity or evidence that a measure is appropriate in relevance and comprehensiveness, 3) reliability or the degree to which scores aren't subject to random error, 4) construct validity which refers to the measures ability to rest the intended constructs or traits, 5), scoring and interpretation or the degree to which the meaning of score is easily understood, and 6) respondent burden or how the measure impacts respondents who complete a given instrument.

3. Results

3.1 Knowledge Acquisition Data Analysis

To determine whether or not Cohort 1 HILA participants (Real-Time Training) demonstrated an increase in HIL, retrospective pre-posttest online self-report surveys collected data based on a four-point scale on health insurance knowledge acquired and self-confidence gained in using the HILA health insurance content following the implementation of each HILA module. After data was cleaned and duplicate responses were eliminated, responses were deidentified and analyzed. Confidence intervals were calculated based on non-paired group means to determine statistically significant increases in knowledge and self-confidence. Similarly, to determine whether or not Cohort 2 HILA participants (On-Demand Training) demonstrated an increase in their knowledge and confidence using HILA curriculum content, results were cleaned, deidentified, and confidence intervals were calculated based on non-paired group means.

3.2 Knowledge Acquisition Results

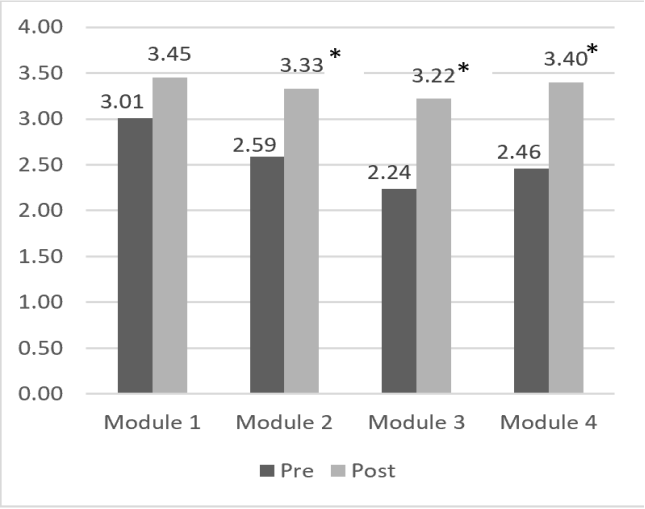

Figure 1. Cohort 1 Pre-Post Knowledge Acquisition

*.05 Statistical Significance from Pre-test

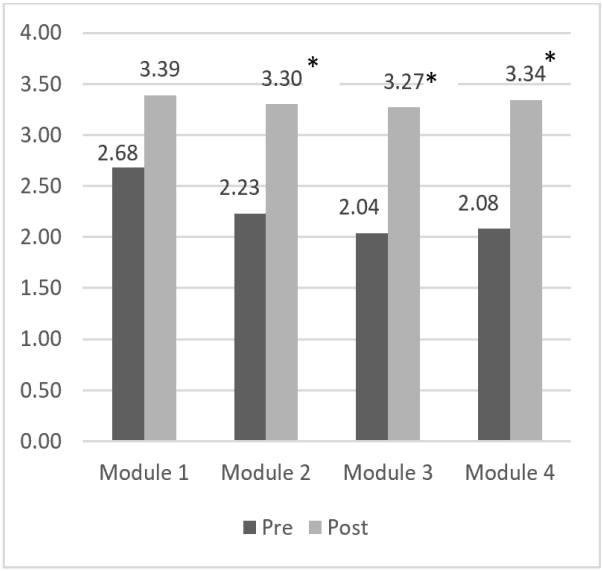

Figure 2. Cohort 2 Pre-Post Knowledge Acquisition

*.05 Statistical Significance from Pre-test

Cohort 1 participants reported statistically significant increases in knowledge acquisition for three out of four modules, as displayed in Figure 1. Specifically, Cohort 1 Module 2 participants (N=36) reported a statistically significant increase from a pre-test mean of 2.59 (CI: 2.19 – 2.99) to a post-test mean of 3.33 (CI: 2.19 – 2.99). Cohort 1 Module 3 participants (N=31) reported a statistically significant increase from a pre-test mean of 2.24 (CI: 1.84 – 2.64) to a post-test mean of 3.22 (CI: 2.92 – 3.51). Cohort 1 Module 4 participants (N=28) reported a statistically significant increase from a pre-test mean of 2.46 (CI: 2.05 – 2.89) to post-test mean of 3.40 (CI: 3.08 – 3.71). Cohort 1 Module 1 participants (N=49) reported a pre-test mean of 3.01 (CI: 2.65 – 3.37) and a post-test mean of 3.45 (CI: 3.16 – 3.74) that trended positively but were not statistically significant.

Cohort 2 participants reported statistically significant knowledge increases from pre- to post for all four modules, as displayed in Figure 2. This included Module 1 participants (N=53) increasing from a pre-test mean of 2.68 (CI: 2.34 – 3.02) to a post-test mean of 3.39 (CI: 3.17 – 3.61) and Module 2 participants (N=50) increasing from a pre-test mean of 2.23 (CI: 1.91 – 2.55) to 3.30 (CI: 3.06 – 3.54). Module 3 participants (N=31) increased from a pre-test mean of 2.04 (CI: 1.69 – 2.39) to a post-test mean of 3.27 (CI: 3.04 – 3.49) and Module 4 participants (N=28) increased from a pre-test mean of 2.08 (CI: 1.69 – 2.46) to a post-test mean of 3.34 (CI: 3.09 – 3.59).

3.3 Confidence Acquisition Results

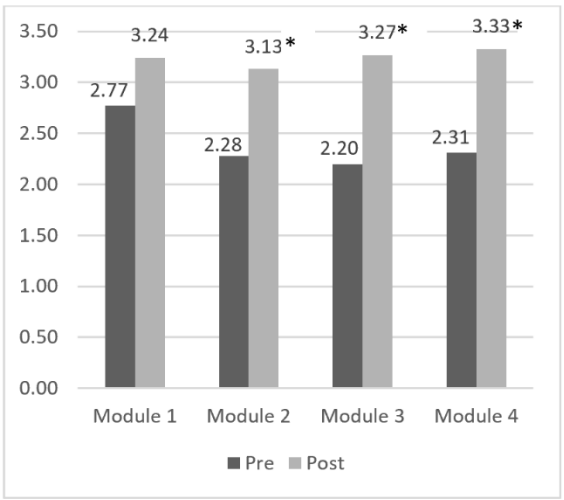

Figure 3. Cohort 1 Pre-Post Confidence Acquisition

*.05 Statistical Significance from Pre-test

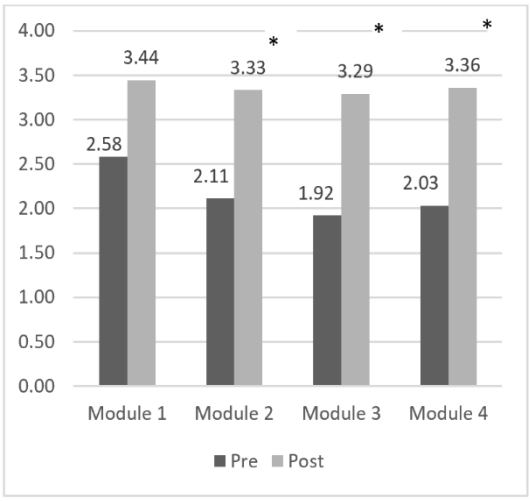

Figure 4. Cohort 2 Pre-Post Confidence Acquisition

*.05 Statistical Significance from Pre-test

Cohort 1 participants reported statistically significant increases in confidence using HILA training content in three out of four modules, as displayed in Figure 1. Specifically, Cohort 1 Module 2 participants (N=31) reported a statistically significant increase from a pre-test mean of 2.28 (CI: 1. – 2.99) to a post-test mean of 3.24 (CI: 2.80 – 3.46). Cohort 1 Module 3 participants (N=28) reported a statistically significant increase from a pre-test mean of 2.20 (CI: 1.76 – 2.65) to a post-test mean of 3.27 (CI: 2.88 – 3.65). Cohort 1 Module 4 participants (N=27) reported a statistically significant increase from a pre-test mean of 2.31 (CI: 1.92 – 2.70) to a post-test mean of 3.33 (CI: 2.98 – 3.67). The Cohort 1 Module 1 participant (N=45) confidence mean trended positively but was not statistically significant from a pre-test mean of 2.77 (CI: 2.31 – 3.22) to a post-test mean of 3.24 (CI: 2.90 – 3.58).

Cohort 2 participants reported statistically significant increases in confidence using HILA training content from pre- to post for all four modules, as displayed in Figure 2. This included Cohort 2 participants (N=59) in Module 1 increasing from a pre-test mean of 2.58 (CI: 2.23 – 2.93) to a post-test mean of 3.44 (CI: 3.22 – 3.66) and Module 2 participants (N=57) increasing from a pre-test mean of 2.11 (CI: 1.80 – 2.42) to 3.33 (CI: 3.10 – 3.56). Cohort 2 Module 3 participants (N=51) increased from a pre-test mean of 1.92 (CI: 1.59 – 2.25) to a post-test mean of 3.29 (CI: 3.10 – 3.56) and Module 4 participants (N=50) increased from a pre-test mean of 2.03 (CI: 1.68 – 2.39) to a post-test mean of 3.36 (CI: 3.10 – 3.61).

3.3 Data Analysis- Process Evaluation

Process evaluation means were calculated for each Cohort, both by module and overall based on a five-point Likert scale (1 = Very Poor; 2 = Below Average; 3 = Average; 4 = Above Average; and 5 = Excellent). Results were deidentified before analysis.

3.4 Analysis Results- Process Evaluation

Table 2. Individual Process Evaluation Criterion Means by Cohort

Individual Process Evaluation Criterion	Cohort	Modules 1	2	3	4	Criterion Mean
1) Relevancy of Training	**1**	4.18 (N=45)	4.40 (N=36)	4.44 (N=28)	4.53 (N=25)	4.39
	2	4.20 (N=55)	4.38 (N=53)	4.32 (N=51)	4.28 (N=49)	4.30
2) Usefulness of Training Content	**1**	4.22 (N=45)	4.50 (N=36)	4.53 (N=28)	4.46 (N=25)	4.43
	2	4.22 (N=55)	4.30 (N=53)	4.41 (N=51)	4.30 (N=49)	4.31
3) Quality of Training Materials	**1**	4.24 (N=45)	4.34 (N=36)	4.33 (N=28)	4.49 (N=25)	4.35
	2	4.00 (N=55)	4.08 (N=53)	4.20 (N=51)	4.13 (N=49)	4.10
4) Quality of Trainers	**1**	4.18 (N=45)	4.34 (N=36)	4.50 (N=28)	4.49 (N=25)	4.38
	2	4.03 (N=55)	4.18 (N=53)	4.47 (N=51)	4.19 (N=49)	4.22

As displayed in Table 2, Cohort 1 (Real-time Training) and Cohort 2 (On-Demand) participants rated each of the training modules highly in terms of the process evaluation criteria including the relevancy of the training, usefulness of the training, quality of training materials, and quality of the trainers. Each module received a score of 4 or higher based on a maximum score of 5. Overall, Cohort 1 participants scored each module higher than Cohort 2 based on the individual process evaluation criteria except in Module 1 for relevancy and usefulness. Table 4 also displays the combined mean by module based each individual process evaluation criterion. For example, Cohort 1 when compared to Cohort 2 scored relevancy (4.39 vs 4.30), usefulness (4.43 vs 4.31), quality of materials (4.35 vs 4.10), and quality of trainers (4.38 vs 4.22) higher for each module.

Table 3. Total Evaluation Criteria Means by Cohort

		Total Module 1 Criteria Mean	Total Module 2 Criteria Mean	Total Module 3 Criteria Mean	Total Module 4 Criteria Mean	Total Training Criteria Mean
Total Evaluation Criteria Mean	**Cohort 1**	4.21	4.40	4.45	4.50	4.39
	Cohort 2	4.11	4.24	4.35	4.23	4.23

Table 3 displays the overall means by combining the four criteria (relevancy, usefulness, quality of materials, and quality of trainers) for each of the modules for both cohorts. Both Cohorts scored Module 1 the lowest in terms of the process evaluation criteria means (4.21 for Cohort 1 and 4.11 for Cohort 2), although there were cohort differences in the means for modules 2, 3, and 4. For example, Cohort 1 participant evaluation means increased in a linear fashion from Module 1 (4.21), Module 2 (4.40), Module 3 (4.45), and Module 4 (4.50). Cohort 2 rated Module 3 the highest (4.35), followed in descending order by Module 2 (4.24), Module 4 (4.23), and Module 1 (4.11) (see Table 3). Table 3 also includes the total training mean that combines the scores for all four modules for each cohort. The total training mean for Cohort 1 was 4.39 and for Cohort 2 was 4.23.

4. Discussion

4.1 Significance of Findings

Health insurance, whether public or private, can be a complex topic and making insurance choices is often challenging. HIL has been linked to more effective health care utilization, yet there is a paucity of studies that have examined training programs for either adults with disabilities directly or staff from organizations that provide technical assistance to adults with disabilities on basic and advanced understanding of choosing and using health insurance. Consequently, for persons with disabilities, who are users of private and significant users of public insurance such as Medicaid or Affordable Care Act-supported insurance, there are few resources to assist them navigate insurance choices and usage. The purpose of the HILA Project, then, was to determine the efficacy of a training program for CIL staff in fostering health insurance literacy; increasing knowledge of health insurance and the confidence to provide that information to consumers.

Both Cohort 1 (online real-time training) and Cohort 2 (on-demand viewing training) participants achieved statistically significant increases in knowledge acquisition of the HILA content in many of the four training modules. Cohort 1 Module 1 (introduction to health insurance) results trended toward statistical significance and statistical significance was achieved for Modules 2 (health insurance types), Module 3 (choosing health insurance), and Module 4 (using health insurance). Lack of statistically significant knowledge gain for Module 1 is partly explained by Cohort 1 having a high baseline (pre-test) score for Module 1 (see Figure 1). In comparison, Cohort 2 knowledge acquisition outcome pre-post-test training scores were statistically significant for all four modules.

Overall, Cohort 1 started at a higher knowledge baseline for each module and obtained slightly higher post-test scores compared to Cohort 2, with the exception of Module 3 which was slightly higher for Cohort 2. We expected Cohort 1 to have achieved substantially higher post-test results compared to Cohort 2 given "live" access to the two real-time trainers for answering questions and opportunities to participate in novel online discussions with other participants, notwithstanding the potential for ceiling effects. Interestingly, Cohort 2 "gained" more knowledge as measured by starting with a lower pre-test mean score than Cohort 1 to achieving similar post-test scores. This result may be explained by the ability of Cohort 2 participants to view the on-demand modules repeatedly, as long as the evaluation surveys were not completed. Alternatively, the on-demand training format may have unexpectedly reflected the learning preference of Cohort 2 participants. It is notable that HILA participants were not given a choice between online real-time and online on-demand training modalities a priori.

In addition to knowledge acquisition, the HILA Project assessed if participants demonstrated increases in their self-confidence using training content during subsequent technical assistance sessions and/or peer-counseling with consumers. Similar to knowledge acquisition, both Cohort 1 and Cohort 2 participants achieved statistically significant increases in their confidence communicating about health insurance (again with the exception of Module 1 for Cohort 1). Interestingly, while Cohort 2 reported lower pretest baseline scores in each module (similar to knowledge acquisition scores), Cohort 2 reported higher posttest scores for each module compared to Cohort 1 (see Figure 4). This unexpected result may also be attributable to Cohort 2 participants viewing on-demand modules multiple times or simply participant learning preference.

Each of the individual process evaluation criterion (relevancy, usefulness, training material quality, trainer quality) was scored very highly by each cohort, regardless of training modality. In general, when Cohort 1 evaluated each module on the individual criterion, the means increased from Module 1 to Module 4 in a fairly linear fashion (lower to higher). In contrast, Cohort 2's evaluation of each module using the evaluation criterion was more variable as described in Table 3. However, there was variation in the scoring of the process evaluation criterion by module for both cohorts. A potential explanation for this variability may be a disconnect between curricular choices made by the iPAT focus group and curriculum authors compared to the perspective of training participants of each module. For example, despite the high scores, some participants could have been looking for different and more complex health insurance terms than those that were included in Module 1 to reflect the unique experiences of people with disabilities.

Overall, the HILA training was effective in increasing health insurance literacy and confidence using the training content among participants in both web-based real-time and web-based on-demand trainings. In addition to solid gains in health insurance knowledge acquisition and confidence, the process evaluation data demonstrated the importance of the module's content and utility and satisfaction with the curriculum materials and trainers. These results speak both to the effectiveness of the ADDIE model, as well as the benefit of using the integrated participatory action training (iPAT) approach that brought together disability community members, content experts, and researchers to co-create the HILA training program. Despite promising results, additional work is necessary to fully validate the HILA training program (see below).

4.2 Implications

The HILA project highlights several benefits for a training that focuses on health insurance literacy aimed at information intermediaries such as CIL staff that work with people who have disabilities. The HILA training demonstrated efficacy in increasing knowledge acquisition and confidence subsequently using this content for the training participants. More rigorous research is needed to validate the HILA outcome measures and establish the effectiveness of the HILA training program. In addition to improving current HILA measures, considering the adoption of the valid and reliable Health Insurance Literacy Measure (Paez, et al., 2014) would benefit future research. Future research would also benefit by adopting a stepped-wedge randomization design where cohorts act as a control before crossing over to active intervention (Hussey & Hughes, 2007). This would ensure HILA participants acting as a control would not be denied the potential benefits of the training program. Similarly, collection of more information (independent variables) from participants would facilitate analysis of factors related to high levels of health insurance literacy.

Importantly, people with disabilities have dynamic and changing health conditions including facing more barriers to using health insurance than the general population. As a consequence, knowledgeable staff at disability organizations that can confidently and competently serve the disability population is an ongoing and acute need for both current staff and new

hires. Based on our initial results, both real-time and on-demand training modalities may address this informational need. Assuming the originators of the HILA training program are unable to expand their research or offer the HILA program, a strategy to consider is for national disability associations that provide technical assistance on health insurance to adults with disabilities to negotiate access to the on-demand HILA training program for their staff. Alternatively, there may be opportunities for disability organizations to participate in a train-the-trainer model whereby they develop a local trainer who trains other staff. Finally, instead of disability organizations relying on individualized technical assistance, disability organizations could plan and implement an informational seminar (i.e., training) to groups of their constituents with disabilities prior to and during health insurance open enrollment periods. Regardless of strategy pursued, there will need to be a commitment to continuous evaluation to ensure ongoing relevancy and effectiveness of the HILA training.

4.3 Limitations

We note several limitations in this study. First, our use of a convenience sample volunteering to participate in the training suggests that results in this study may apply to the subsample of CIL staff that participated in the HILA intervention rather than the larger population of CIL staff. As noted above, the use of randomized designs could increase the evidentiary basis for the HILA training program. We also note the differences in participation rates by cohort (more participants in Cohort 2). In addition, in Cohort 1, there was a reduction over time of cohort participants providing evaluation data, while in Cohort 2, some participants dropped out. Both of these occurrences may limit the accuracy of knowledge and confidence acquisition results and evaluation analysis. Ensuring high levels of participation could be addressed by providing financial incentives to participate in the research, requiring completed evaluation forms to participate in subsequent modules, or encouraging organizational recognition for HILA training participation. In addition, the evaluation criteria were not weighted, although all criterion were presented to the iPAT focus group and approved by them, suggesting an equal weighting based on inclusion. By taking the HILA research to scale, more rigorous validity and reliability testing could be conducted on all outcome measures. Despite these limitations, this study provides ample room for continued research into health insurance literacy acquisition and its implementation in technical assistance contexts.

5. Conclusion

While more research on the best ways to conduct training on health insurance to CIL staff is needed, the HILA project provides initial insights on the importance of training for improving knowledge acquisition and confidence on health insurance topics. Ultimately, the goal for CILs is to support people with disabilities in community living and independence. Assisting in navigating the complexities of health insurance determination, acquisition, and usage brings people with disabilities one step closer to that goal. The results of the HILA project also confirms that there is a need for training CIL staff on the topic of health insurance and an iPAT approach augmented by the ADDIE model is effective in addressing this need. Therefore, additional opportunities should be pursued using a combined ADDIE- iPAT approach that develops trainings that are important to people with disabilities.

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Authors contributions

Dr. Drum and Dr. Ditsch were responsible for study design and revising. Dr. Ditsch was responsible for data collection and analysis. Dr. Drum drafted the manuscript and Dr. Ditsch revised it. All authors read and approved the final manuscript.

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Competing interests

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