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Facultad de Educación
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El rol de la investigación en la formación inicial de profesores y profesoras de educación básica

Tesis en modalidad compendio de publicaciones conducente al título de Doctor en
Educación

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Tabla de contenido

Agradecimientos	4
Resumen	6
Introducción	9
Planteamiento del Problema	12
El rol de la investigación en la nueva carrera docente en Chile	12
La relación entre docencia e investigación en Educación Superior.....	14
Tensiones y beneficios de la investigación en el ámbito educacional	17
Resumen y foco del presente estudio	20
Metodología.....	22
Diseño Metodológico	22
Enfoque	22
Descripción del curso “Seminario de Investigación en Educación”	23
Instrumentos de Recolección de Datos.....	25
Participantes	26
Análisis de Datos	27
Validez y Confiabilidad	29
Preguntas Orientadoras.....	31
Publicaciones.....	32
Publicación 1	32
Publicación 2	57
Discusión y conclusiones	83

Implicancias	85
Limitaciones del estudio	88
Proyecciones futuras	89
Referencias Bibliográficas.....	90

Tabla de esquemas y figuras

Figura 1.....	11
Imagen 1.....	15
Imagen 2.....	15
Imagen 3.....	16
Publicación 1	
Gráfico 1.....	55
Tabla 1.....	56
Publicación 2	
Tabla 1.....	82

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Resumen

La tesis que aquí se presenta, en formato de compendio de publicaciones, indaga en el rol de la investigación en la formación inicial de profesores de Educación Básica. La relevancia del presente estudio se centra en que existe un alto nivel de acuerdo, en la literatura internacional, en que la investigación es importante en la labor docente, pues es una práctica fundamental de la profesión, característica de docentes de calidad. Junto a lo anterior, al promulgarse en el país la ley 20.903 de 2016, que regula el desarrollo profesional docente, la investigación emerge como una práctica deseable que debería ser utilizada por los profesores. De esta manera, se podría materializar la idea de que los profesores participen de manera informada en innovaciones pedagógicas, trabajen colaborativamente con otros profesores para solucionar problemas educacionales, reflexionen sobre su propia práctica y participen en investigaciones pedagógicas. Por esto, el desarrollo de contenidos y habilidades de investigación es importante desde la formación inicial.

Vinculado a lo anterior, el presente estudio apunta a comprender qué aprenden los profesores en formación sobre investigación y cómo visualizan el rol de la investigación en su futura práctica. Dos preguntas guían la indagación:

1. ¿Qué ganancias adquieren los docentes en formación de enseñanza básica luego de realizar un curso de investigación?
2. ¿Qué rol jugará la investigación en la futura labor docente de los profesores en formación de enseñanza básica?

103 profesores en formación participaron de manera voluntaria en el estudio respondiendo un cuestionario al inicio y término del curso. En ésta última instancia y, para

profundizar en su experiencia, 33 de ellos participaron en una entrevista. Los participantes pertenecen a la carrera de Educación Básica de una universidad tradicional-privada

Los artículos que componen este compendio de publicaciones responden a las dos preguntas que orientan el presente estudio.

El primero de ellos (*“Developing research skills in pre-service elementary teachers”*, actualmente en revisión en la revista *“Teacher development”* – WoS core collection ESCI y Scopus Q2 –) se orientó a identificar las ganancias en investigación percibidas por los y las docentes en formación al finalizar el curso. Para este fin se aplicó el cuestionario CURE (Classroom Undergraduate Research Experience) y se realizaron entrevistas en profundidad. Los análisis mostraron que las mayores ganancias se centraron en la percepción de autoeficacia adquirida por ellos, la cual se evidenció en la confianza expresada de poder desarrollar un proyecto de investigación de manera independiente y de mejorar, a través del uso de la investigación, su práctica docente. Junto a lo anterior se reportaron también ganancias significativas en el desarrollo de habilidades de investigación, específicamente en escritura académica, lectura de literatura, recolección y análisis de datos y presentación de resultados de manera oral y escrita.

El segundo artículo (*“Pre-service elementary teachers’ perceptions of conducting and consuming research in their future professional practice”*, publicado en *“Teachers and teaching: Theory and praxis”* – WoS core collection y Scopus Q1 –) indagó en el futuro uso que los y las docentes en formación le darán a la investigación, una vez que finalicen su carrera y ejerzan como docentes de aula. A través de un análisis fenomenográfico, emergieron cuatro categorías de descripción que variaron desde percibir la investigación como algo desconectado de su labor docente, hasta su utilidad para generar nuevo conocimiento. A la vez, se identificaron tres dimensiones de variación que enriquecieron las

categorías previamente mencionadas: el uso de la investigación, el rol del docente respecto a la investigación y, finalmente, donde impactaría su uso.

En ambos artículos se discuten los resultados en términos de su aporte al conocimiento sobre formación de profesores como a las implicaciones prácticas que de ellos se desprenden.

Introducción

Esta tesis es el resultado de un estudio sobre el rol de la investigación en la formación inicial de profesores de Educación Básica. Lo anterior cobra relevancia debido a que la nueva ley N° 20903 de carrera docente, promulgada el año 2016, establece, entre otros elementos, a la investigación como una actividad central, necesaria e indisoluble de la labor docente, por lo cual su desarrollo y promoción desde la formación inicial, se hace fundamental. A pesar de lo anterior, poco sabemos cómo se materializa.

En esta dirección, el presente estudio indaga en las ganancias en habilidades de investigación que obtienen docentes en formación de la carrera de Educación Básica, luego de haber finalizado un curso sobre esta temática. A la vez, busca identificar qué rol perciben que jugará la investigación en su labor docente cuando sean profesores en ejercicio.

El presente documento se estructura de la siguiente manera:

- En la sección *planteamiento del problema* se presenta una revisión que aborda 3 temáticas centrales. En primer lugar, se explicita en el rol que la investigación juega, en la actualidad, en el sistema educacional chileno. Luego, se indaga en la literatura internacional para profundizar en el rol que la investigación tiene en Educación Superior y la tensión que se presenta con el ámbito docente. Finalmente, la revisión se centra en los beneficios y en las tensiones que presenta la investigación en la labor docente y también, en el proceso de formación inicial.
- En la sección *metodología* se describe la metodología global empleada en el presente estudio, específicamente su diseño, instrumentos de recolección de los datos utilizados y las formas de análisis de éstos. A la vez, se declaran especificaciones metodológicas relacionadas a cada uno de los artículos que integran este compendio.

- En la sección *publicaciones* se presentan los artículos generados que responden a las dos preguntas de investigación que guían este estudio
- En la sección *conclusión y discusión* se relacionan los resultados obtenidos a aspectos declarados en la revisión de literatura. A la vez, declara las limitaciones que se identifican en el estudio, su relevancia práctica y se establecen sugerencias para su proyección futura.
- El documento finaliza con las *referencias bibliográficas* utilizadas.

Visión panorámica del proyecto de investigación

Con el fin de entregar una mirada holística del presente compendio, la Figura 1 presenta los elementos centrales de cada uno de los artículos que lo componen, y su relación con los elementos centrales de la investigación global.

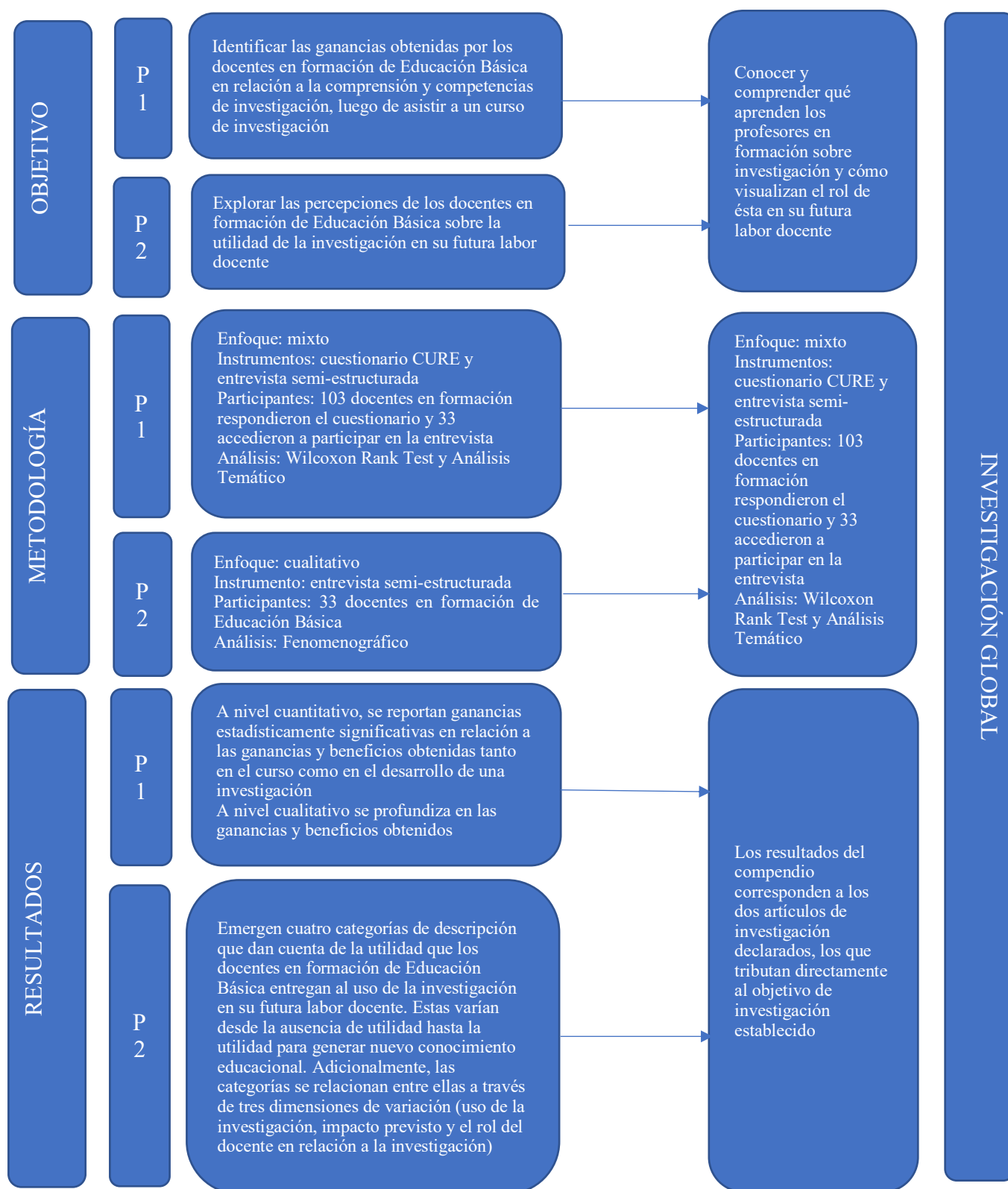


Figura 1. Esquema de relación entre los elementos centrales de las publicaciones con los de la investigación global. Las terminaciones P1 corresponden a publicación 1 y P2, a publicación 2.

Planteamiento del Problema

El rol de la investigación en la nueva carrera docente en Chile

Durante los últimos años, la profesión docente ha sido ampliamente debatida a nivel nacional. Las investigaciones realizadas sobre esta temática se han centrado en aspectos que abordan temáticas tales como su bienestar y enfermedades asociadas a la profesión como el síndrome de burnout (Darrigrandi y Durán, 2012; Jiménez, Jara y Miranda, 2012; Ortiz et al., 2012; Cornejo, 2009), la visión y valoración social que posee la profesión docente (Cabezas y Claro, 2011) y el análisis holístico de la misma como, por ejemplo, en torno a la evaluación a la que se enfrentan los docentes en nuestro país (Ávalos, 2018; Santelices, Valencia, González y Taut, 2017) y a su identidad profesional (Sisto, Montecinos y Ahumada, 2013; Sisto, 2012).

Desde hace ya algunos años, Chile ha estado trabajando en torno a la mejora de la calidad de la educación, en donde el rol del docente es clave. En respuesta a lo anterior, el año 2016 se promulga la Ley N°20.903 de carrera docente, la cual aborda tres temáticas centrales:

- a. *Mejora de condiciones laborales:* representado por el aumento gradual de las horas no lectivas y de las remuneraciones.
- b. *Aseguramiento de la calidad en la formación inicial docente:* Relacionado, en primer lugar, con el estado de acreditación de carreras de pedagogía e instituciones de educación superior que las imparten; en segundo lugar, con la aplicación de pruebas diagnósticas al ingreso y un año antes del egreso y, finalmente, con los requisitos de ingreso para poder tener acceso a estudiar dichas carreras.

- c. *Desarrollo profesional docente*: El cual aborda la inserción de los nuevos docentes a los establecimientos escolares a través de programas de mentorías, el sistema de certificación de docentes en ejercicio y su desarrollo profesional.

Es precisamente en esta última temática donde se anidan nuevos desafíos para los docentes chilenos, enunciándose de manera explícita, las habilidades de investigación con las que deben contar los y las profesoras para que apoyen y fortalezcan su labor (artículo 19; 19K). Específicamente, se espera que los docentes reflexionen en y sobre su propia práctica (ámbito promovido por Schön desde 1987), que se comprometan a realizar investigaciones que apoyen y favorezcan su labor, trabajen colaborativamente en solucionar problemas de índole educativo y que desarrollen innovaciones pedagógicas (Ley N°20903, 2016).

En resumen, existe un nuevo marco que regula la carrera docente, desde la formación inicial hasta el desarrollo profesional de profesores en ejercicio. La investigación asume un rol explícito en este nuevo escenario, elevándose así la necesidad de desarrollar habilidades de investigación desde la Formación Inicial Docente (en adelante FID); sin embargo, en este marco no se establece explícitamente cómo poder materializar el desarrollo de las habilidades de investigación en la formación de profesores, de manera de entregar las herramientas que posibilitarían ejercer un rol como el que la nueva carrera docente establece en este ámbito.

Con el objetivo de tener herramientas conceptuales para indagar y reflexionar sobre este tema, en las siguientes sub-secciones se indaga en la literatura internacional para profundizar en el amplio debate existente en torno a la relación entre docencia e investigación en educación superior. Primero se describe este debate en un nivel general y luego se profundiza en el nivel particular y específico que concierne a esta tesis: la relación entre docencia, investigación y práctica profesional en la carrera docente.

La relación entre docencia e investigación en Educación Superior

La literatura internacional ha debatido intensamente sobre la relación existente entre la docencia y la investigación. Este debate se remonta a la era de Wilhelm von Humboldt a comienzos del siglo XIX (Simons y Elen, 2007), quien estableció que la universidad debería ser un lugar en donde tanto la investigación como la docencia estén en permanente unión. De esta manera, elaboró un modelo que se centra en el estudiante, específicamente en sus capacidades para poder realizar investigaciones de manera autónoma, acompañado y orientado por un docente. A pesar de lo establecido hace ya dos siglos, en la actualidad la comunidad académica percibe una tensión en el modelo establecido originalmente por Humboldt, declarándose así una brecha entre ambas actividades (Brew, 2003, 2010; Gore y Gitlin, 2004; Broekkamp y van Hout- Wolters, 2007; Borg, y Alshumaimeri, 2012; Zhang y Shin, 2015). Para poder hacer frente a la problemática declarada anteriormente, se han buscado maneras de solventarlo, siendo un posible lugar de acción, el ámbito curricular. Para esto, se han desarrollado diversos modelos que vinculan la investigación y la docencia. Dentro de estos, podemos encontrar el de Healey y Jenkins (2009), Levy y Petrulis (2012) y Brew (2013). El modelo de Healey y Jenkins (2009) está construido en base a cuatro cuadrantes: impulsado por investigación (que consiste en intencionar el conocimiento actualizado sobre investigaciones en los y las estudiantes, siendo estas de interés de sus académicos), orientado a la investigación (caracterizado por el desarrollo de habilidades investigativas. En este cuadrante los estudiantes conocen sobre los distintos procesos que poseen las investigaciones), tutorías de investigación (definido por el debate activo y crítico, en torno a investigaciones, por parte de los y las estudiantes), y, finalmente, basado en investigación (que establece que los y las estudiantes diseñan y llevan a cabo sus propias

investigaciones, siendo el académico un facilitador en este proceso). Estos cuadrantes varían de acuerdo con dos grandes temáticas: por un lado, tipo de aprendizaje y concepción de docencia y, por otro, aspecto de investigación prioritario en la enseñanza (contenido o proceso).

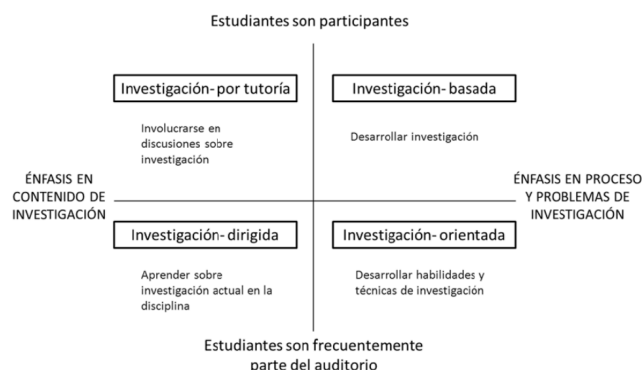


Imagen 1. Modelo de Healey y Jenkins (2009). Fuente: elaboración propia

El segundo modelo (Levy y Petrulis, 2012), es un modelo similar en estructura al anterior. También se conforma de cuatro cuadrantes, los cuales varían de acuerdo con dos temáticas: por un lado, el tratamiento del conocimiento (si es creado o ya existente) y por otro, el grado de apoyo del docente (que va desde un apoyo más estructurado y guiado por parte del/la docente, a uno más libre y de acompañamiento).

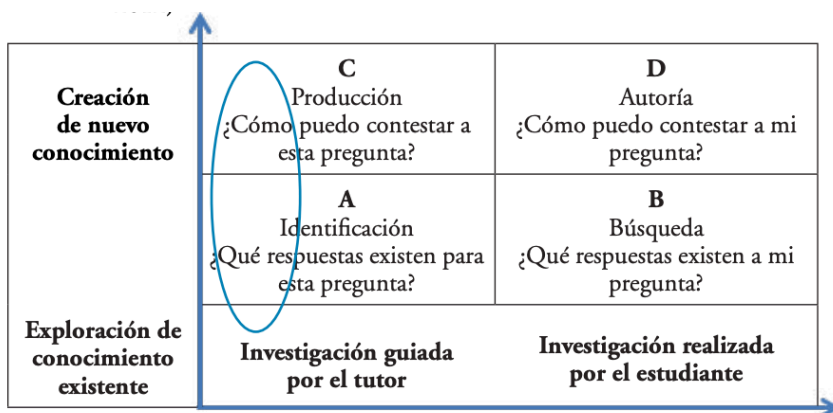


Imagen 2. Modelo de Levy y Petrulis. Fuente: González, Guzmán – Valenzuela y Montenegro, 2016.

El tercer y último modelo es el planteado por Brew (2013), el cual también se conoce como el modelo rueda. Se caracteriza por ser un modelo dinámico y no prescriptivo, en donde en el centro de éste, se encuentra el estudiante y su aprendizaje. Está formado por niveles, los que van desde los académicos y sus decisiones individuales en torno a la integración de la docencia y la investigación (nivel micro) hasta las decisiones de índole curricular de las facultades universitarias (nivel macro).

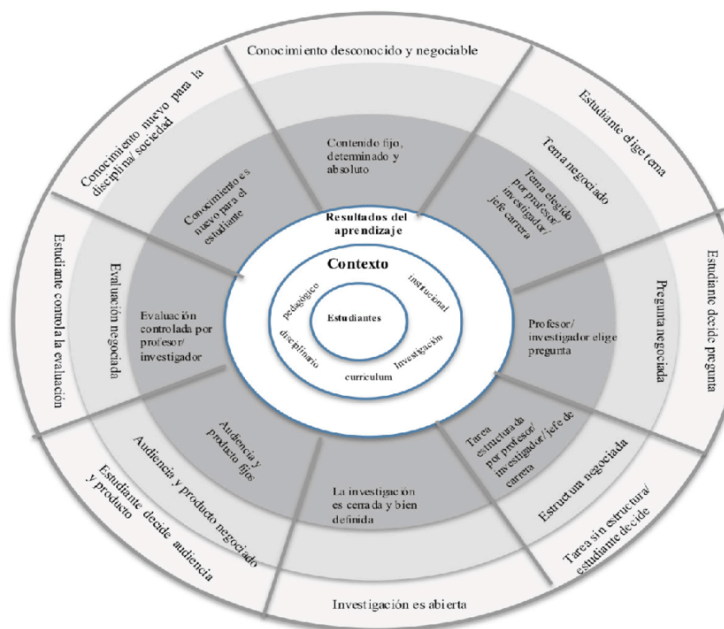


Imagen 3. Modelo de Brew. Fuente: González, Guzmán-Valenzuela y Montenegro, 2016.

El primer modelo, de Healey y Jenkins, es el único que se ha utilizado para alimentar los planes de estudios de algunas carreras de formación de profesores, así como para evaluar el estado de la investigación en ellas (Munthe y Rogne, 2015; Afdal y Spernes, 2018).

Tensiones y beneficios de la investigación en el ámbito educacional

Si nos enfocamos específicamente en la FID, encontramos que esta área no está exenta de la tensión existente entre investigación y docencia. De hecho, existen investigaciones que la han abordado en torno a diversas temáticas, como por ejemplo, el ámbito curricular (Diezmann, 2005), la construcción de capacidad investigativa en los docentes que imparten clases en formación inicial (Murray et al. 2009; Visser-Wijnveen, Van Driel, Van der Rijst, Verloop y Visser, 2010) y la necesidad del desarrollo de habilidades de investigación en estudiantes de pregrado (Gray, 2013)

Como una forma de responder a lo anterior, algunos países como Finlandia y Noruega han establecido en sus currículos de FID un enfoque basado en investigación (research-based teacher education), en donde la totalidad de las asignaturas tributan a aspectos ligados a la indagación. Estos enfoques se caracterizan por estar centrados en el estudiante, debido a que promueven un involucramiento activo por parte de ellos en la práctica investigativa (Afdal y Spernes, 2018; Munthe y Rogne, 2015; Krokfors, Kynäslähti, Stenberg, Toom, Maaranen, Jyrhämä, Byman y Kansanen, 2011; Jyrhämä, Kynäslähti, Krokfors, Byman, Maaranen, Toom y Kansanen, 2008). La finalidad de este tipo de currículo se centra en que una vez finalizado el proceso de formación inicial, el nuevo docente, a través de la formación en investigación desarrollada en pregrado, aborde aspectos esenciales como la toma de decisiones informadas (alejándose así de aquellas basadas meramente en la experiencia) y que utilicen las habilidades en investigación desarrolladas a favor del proceso enseñanza-aprendizaje (Westbury et al., 2005) con una actitud positiva hacia ésta (Krokfors et al., 2011).

Como se señaló anteriormente, si bien en FID se han hecho esfuerzos por fortalecer y consolidar la relación existente entre las actividades de docencia e investigación, esto no

ha sido un camino fácil, materializándose en instancias aisladas adoptadas por algunos países, manteniéndose así el desafío para su consolidación.

Desde hace ya décadas es posible evidenciar una distancia entre las actividades de docencia e investigación, las que no se centran exclusivamente en FID, sino que se relacionan a dos actores educativos: docentes en ejercicio e investigadores educacionales (ver, por ejemplo, Core, 1953; Stenhouse, 1975). La literatura internacional evidencia que ambos actores identifican tensiones. Por una parte, los investigadores educacionales consideran que los docentes no poseen las herramientas, conocimientos ni habilidades necesarias para poder llevar a cabo una investigación (Reis-Jorge, 2007). A la vez, perciben que sus investigaciones no han tenido un impacto que apoye la labor docente (Hargreaves, 1999, Vanderlinde y Braak, 2010). Por su parte, los docentes señalan tener dificultad para poder trabajar con las publicaciones de los investigadores educacionales, ya que la mayoría de ellos no poseen acceso a bases de datos (Borg, 2010). También mencionan que las publicaciones académicas no son de fácil comprensión y que lo que indagan los investigadores educacionales, tiene una escasa relación con su diaria labor (Vanderlinde y Braak, 2010). Finalmente mencionan que el escaso tiempo es otra variable que dificulta su trabajo en investigación, debido a que poseen una gran cantidad de trabajo que realizar tanto dentro como fuera del aula (Martell, 2016).

Como una forma de disminuir las tensiones establecidas anteriormente, se plantea como propuesta la promoción de la “Investigación en la práctica” (practitioner research) la cual posiciona al docente como un investigador activo en su contexto laboral inmediato (Gray, 2013). Con esto, se espera que los docentes no solo tengan un rol pasivo frente a la investigación, siendo principalmente consumidores de ésta, sino que posean un rol en donde sean productores de investigación y generadores de conocimiento, lo que se traduce en la

realización de investigaciones en su propio contexto laboral (Falk, 2004; Del Carlo y Hinkhouse, 2010; Cochran-Smith & Lytle, 2009; Yogev y Yogev, 2006; Leat, Reid, y Lofthouse, 2015; Mincu, 2015). Reafirmando lo mencionado anteriormente, Earl y Timperley (2008) señalan que investigar es una característica que posee un profesor de alta calidad, lo que se traduce en tener rol crucial como agente de mejora. En este sentido, la investigación y sus diversos estilos y modalidades juegan un papel fundamental en la labor docente. Algunos ejemplos son el trabajo con los datos (Wardrip y Herman, 2018), el estudio de la lección (Demir, Sutton.Brown y Czerniak, 2012) y el autoestudio (Lunenberg y Samaras, 2011).

Si bien estas tensiones se encuentran presentes, se establecen a la vez beneficios de su uso, los cuales han sido ampliamente estudiados (Blakemore, 2012; Sales, Traver y García, 2011; Hall, 2009). Estos beneficios se centran en tres grandes áreas: en la valoración que poseen de su profesión, en la labor que ejercen y, finalmente, en el desarrollo de competencias investigativas en sí. En relación con la valoración profesional, los y las docentes perciben que el uso de la investigación les permite transitar de un rol meramente técnico a uno profesional (Postholm, 2009), fortaleciendo así la valoración que poseen de su profesión. En relación con labor que desempeñan los docentes la investigación los beneficia, por ejemplo, a través de la lectura de literatura actualizada, en donde pueden fortalecer y conocer técnicas de enseñanza novedosas (Joram, 2007; Niemi y Negvi, 2014). A la vez, les permite identificar problemas que emerjan en sus salas de clase y buscar posibles soluciones a través de una toma de decisiones informada (Ersoy y Çengelci, 2008) y que promuevan ambientes prósperos de aprendizaje (Fareh y Saeed, 2011), identificando las necesidades que puedan tener cada uno de sus estudiantes (Parkison, 2009). También es importante señalar que es un insumo importante para su formación continua, beneficiando el desarrollo de una

actitud positiva para su desarrollo profesional (Dunn, Harrison y Coombe, 2008; Cartrette y Melroe-Lehrman, 2012). Finalmente, en relación a la adquisición de competencias propias de la investigación, ésta permite a los docentes desarrollar confianza, por ejemplo, en la lectura de artículos y en la adquisición y fortalecimiento de competencias más complejas como, por ejemplo, escritura académica, análisis de datos y desarrollo del pensamiento crítico (Healey y Jenkins, 2009; Hunter, Laursen y Seymour, 2007; Van der Linden, Bakx, Ros, Beijgaard y Vermeulen, 2012). Finalmente, se espera que transiten de ser meramente consumidores de investigación a un uso activo de estas competencias a través de la producción de investigación (Cochran-Smith y Lytle, 2009).

Resumen y foco del presente estudio

En resumen, la literatura revisada ha mostrado lo siguiente:

- La nueva carrera docente en Chile ha dado un énfasis importante al uso de la investigación por parte de los profesores del sistema escolar. Sin embargo, es menos claro cómo esto puede materializarse o qué tipo de herramientas deberán entregarse en la FID para que los futuros profesores puedan materializar la visión presentada en la ley.
- El rol de la investigación en la formación universitaria ha sido un tema de larga data en la literatura internacional, que se remonta a la idea Humboldtiana de Universidad. Sin embargo, esta no ha estado exenta de tensiones. Diversos modelos han planteado la posibilidad de la integración curricular de actividades de investigación como una alternativa para incorporarla en la formación universitaria a nivel de pregrado.

- En el ámbito de la profesión docente existen importantes tensiones entre investigación y formación profesional. Sin embargo, al mismo tiempo se destacan beneficios potenciales del uso de la investigación en la práctica profesional de los docentes.

En este estudio se indaga qué aprenden los y las estudiantes de pedagogía básica sobre investigación en su formación profesional y cómo visualizan que esta les puede servir en su futuro profesional. Esto es relevante pues permitirá conocer estos elementos con miras a fortalecer la relación existente entre investigación, formación profesional y práctica. Lo anterior, a través del desarrollo de habilidades de investigación desde la formación inicial docente, promoviendo así el cumplimiento de lo establecido en la Ley promulgada.

Metodología

Diseño Metodológico

El diseño metodológico reportado en este compendio realiza una descripción holística del estudio, estableciendo a la vez, cómo se materializan específicamente en los artículos que lo conforman el presente compendio.

Enfoque

El presente estudio indaga en las ganancias en investigación percibidas por los y las docentes en formación de la carrera de educación básica de una universidad tradicional-privada, una vez finalizado un curso basado en investigación. Junto a lo anterior, busca identificar el uso que le darán a la investigación en su futura labor docente. Para poder responder a lo anterior, se llevó a cabo una investigación de carácter mixto en donde se aplicaron instrumentos y analizaron datos de naturaleza cualitativa y cuantitativa (Creswell y Plano Clarke, 2011; Teddlie y Tashakkori, 2009). El diseño específico utilizado en este estudio corresponde al *paralelo convergente*, en donde se busca una mayor comprensión de la temática indagada (Creswell y Plano Clark, 2011).

A continuación, se presenta una descripción del curso basado en investigación al que atendieron los y las docentes en formación de educación básica.

Descripción del curso “Seminario de Investigación en Educación”

El curso Seminario de Investigación en Educación pertenece a la carrera de Educación Básica de una universidad tradicional-privada. Se imparte en el cuarto año de la carrera, es de carácter semestral y consta de dos módulos pedagógicos (1 hora 20 minutos cada módulo) que se realizan semanalmente. Debido a la cantidad de docentes en formación que componen cada cohorte, el curso se imparte en ambos semestres distribuidos en dos o tres secciones. Al momento de la investigación, el objetivo del curso residía en la identificación de un problema que emergiera de la Práctica III (el cual debe ser cursado de manera paralela), realizando posteriormente, el análisis o profundización de la(s) variable(s) que estuviesen indagando. Derivado de lo anteriormente mencionado, el principal insumo evaluativo corresponde a la elaboración de un artículo de investigación, el cual se construye en tres etapas a lo largo del curso.

La metodología del curso se describe a continuación:

- a. *Realización de Clases Magistrales:* Las clases son lideradas tanto por el docente de la cátedra como por los y las docentes en formación. Se trabajan contenidos teóricos como, por ejemplo, estilos de investigación. También se realizan análisis de artículos, presentaciones de trabajos y desarrollo de talleres de carácter práctico, siendo estos: lectura eficaz de artículos, escritura académica y Normas APA.
- b. *Formas de Evaluación:* En el curso estuvo se realizaron evaluaciones de carácter formativo y sumativo. La evaluación formativa se realizó en las presentaciones de adelanto de las investigaciones que cada grupo estaba realizando y, en general, a través de las tutorías (presenciales y en línea). Las evaluaciones sumativas se realizaron en cuatro momentos del curso:

- i. Trabajo estilos de investigación: entrega informe escrito y presentación. Ponderación de un 25% del curso.
 - ii. Sección Introducción del artículo: Integraba problema, marco teórico y revisión de literatura. Ponderación de un 25% del curso.
 - iii. Sección Metodología del artículo: Integraba diseño, participantes, instrumentos de recolección de datos y forma(s) de análisis de éstos. Ponderación de un 20% del curso.
 - iv. Entrega final del artículo: Entrega de las secciones que lo componen (introducción, metodologías, resultados y discusión). Ponderación de un 30% del curso.
- c. *Trabajo en Comunidades de aprendizaje*: Los y las docentes en formación realizan su investigación y, por ende, el artículo de investigación, en grupos pequeños que conforman comunidades de aprendizaje, favoreciendo y promoviéndose de esta manera, el trabajo colaborativo y el aprendizaje conjunto. Lo anterior también se aprecia en otras instancias en donde los y las docentes en formación debieron trabajar en grupos como, por ejemplo, para realizar análisis de artículos
- d. *Realización de Tutorías*: Se realizaron en dos modalidades: presenciales y en línea (online), a través de Google Drive. En relación con las tutorías presenciales, éstas comenzaron a mediados de semestre cuando los docentes en formación comenzaron a trabajar en las dos últimas secciones del artículo: Resultados y Discusión. Estas tutorías se realizaron en horario de clases, en donde cada grupo contaba con 20 minutos para poder realizar consultas y conversar sobre el trabajo. En relación con las tutorías en línea, estas comenzaron cuando los estudiantes iniciaron su investigación buscando el problema y se mantuvieron hasta la semana previa a la

entrega final. Este tipo de tutoría permitió a los estudiantes realizar consultas y recibir retroalimentación de lo trabajado fuera del horario regular de clases, permitiéndoles así avanzar sin necesidad de tener que esperar hasta la clase siguiente.

Instrumentos de Recolección de Datos

Dos instrumentos fueron utilizados para la recolección de datos, los que se detallan a continuación:

- a. *Cuestionario CURE* (Classroom Undergraduate Research Experience; 2008):
Elaborado por David Lopatto y colegas, perteneciente a Grinnell College en colaboración con Hope College, Harvey Mudd College y Wellesley College (todas de Estados Unidos de América). Este cuestionario ha sido utilizado como pre y post-test para medir las experiencias en investigación de los estudiantes. Su aplicación ha sido mayoritariamente en carreras de índole científica (Lopatto et al., 2008; Auchincloss et al., 2014; Perera et al., 2017; Ayella y Beck, 2018). Esta escala Likert de 5 puntos fue utilizada en el presente estudio con el objetivo de identificar las ganancias en investigación obtenidas por los participantes en el curso “Seminario de Investigación”. El instrumento se aplicó en dos instancias:
 - i. Inicio del curso (Pre-test): En esta instancia, el instrumento estaba compuesto por 24 ítems que buscaron identificar las experiencias en investigación que poseían los participantes de manera previa al inicio del curso.
 - ii. Término del curso (Post-test): una vez finalizado el curso, el instrumento que se aplicó se componía de dos partes. La primera estaba formada por los 24 ítems pertenecientes al pre-test. Estos buscaban identificar las

ganancias en experiencias de investigación obtenidas en el curso. La segunda parte está compuesta a la vez por 19 ítems adicionales, los que profundizaban en los beneficios obtenidos de la experiencia de llevar a cabo una investigación.

- b. *Entrevista:* Al finalizar el curso, se invitó a participar a los y las docentes en formación en entrevistas de carácter semi-estructurado, para poder así profundizar en diversos aspectos del curso (Venkat, Osman y Booth, 2009). A la vez, buscaron identificar y comprender las diversas experiencias vividas por parte de los entrevistados (Levy y Petrulis, 2012). La pauta original abordaba temáticas tales como la forma de estudio que tuvieron los participantes en el curso, evaluación de los académicos que impartieron el curso, uso de herramientas digitales, profundización del artículo de investigación que debían realizar, uso de la investigación en su futura labor docente, entre otras. Las entrevistas tuvieron una duración que osciló entre los 20 y los 45 minutos.

Participantes

121 docentes en formación, pertenecientes a la carrera de Educación Básica de una universidad tradicional-privada, asistieron al curso “Seminario de Investigación” durante el primer semestre de 2014 y primer y segundo semestre de 2015. En cada semestre, ellos y ellas fueron invitados a participar de manera voluntaria en el presente estudio. De éstos, 103 docentes en formación (94,2% de género femenino y 5,8% de género masculino) respondieron el cuestionario CURE en las dos instancias de aplicación, específicamente, al inicio y término del curso. Es importante señalar que, de manera previa a la aplicación de los instrumentos, cada uno de los participantes firmó un consentimiento informado, aprobado

por el comité de ética institucional. Al momento de la investigación, la media de edad de los participantes era de 21 años y todos se encontraban cursando su cuarto año de carrera. Una vez finalizado el curso, se los invitó a participar de manera voluntaria en una entrevista, la cual fue realizada finalmente a 33 docentes en formación que asistieron al curso (84,8% de género femenino y 15,2% de género masculino).

Análisis de Datos

Análisis Cuantitativo

Para analizar la primera parte del cuestionario CURE, la que busca identificar las ganancias en investigación obtenidas por los participantes una vez finalizado el curso, se utilizaron los siguientes estadísticos: en primer lugar, para verificar la distribución normal se utilizó la prueba Shapiro-Wilks. Los resultados muestran que no se cumple con el supuesto esperado (a un nivel de significancia de 0.05), por lo cual se decide la utilización de la prueba no paramétrica Wilcoxon Rank Test. La segunda parte del cuestionario forma parte del post-test por lo que se aplica una única vez. Ésta busca identificar los beneficios obtenidos por los docentes en formación luego de haber realizado una investigación. Su análisis se realizó a través del cálculo de las medias obtenidas en cada uno de los 19 ítems las que posteriormente fueron ordenadas desde aquellas en las que se declara la obtención de mayor beneficio hasta las de menor beneficio. Finalmente, es importante mencionar que solo se utilizaron aquellos cuestionarios en donde el pre y post test estaban emparejados

Análisis Cualitativo

En el presente estudio, el tratamiento cualitativo de los datos se realizó a través de dos formas de análisis: análisis temático y análisis fenomenográfico.

El análisis temático (Brown y Clarke, 2006) fue utilizado en el primer artículo de este compendio para dar respuesta a la primera pregunta orientadora de este compendio. Su finalidad fue identificar un conjunto de códigos que conforman temas, los que a la vez profundizan en los tópicos que aborda el cuestionario CURE. Para esto, se siguieron los pasos establecidos por Brown y Clarke (2006) en donde, en primer lugar, hubo una familiarización con las entrevistas a través de una lectura reiterada de ellas. A partir de esto, se generaron una serie de conjuntos de códigos iniciales, los que se fueron definiendo en la medida que se iban iterando revisiones. Una vez que los conjuntos de códigos se estabilizaron, cada uno de ellos pasó a formar parte del corpus de cada tema identificado, los que fueron descritos y sustentados a través de extractos específicos pertenecientes a las entrevistas.

El análisis fenomenográfico fue utilizado para el segundo artículo de este compendio. Es un enfoque que ha sido ampliamente utilizada en educación superior (Tight, 2016), y busca identificar y describir cómo los participantes de un estudio experimentan un fenómeno de maneras cualitativamente distintas (Ackerlind, 2005; Marton y Booth, 1997; Marton, 1986), basándose en la variación vivida de manera colectiva por los participantes y no en experiencias individuales del fenómeno (Reed, 2006). Este análisis permitió explorar las diversas maneras en que los docentes en formación usarán la investigación en su futura labor docente, respondiendo de esta manera, a la segunda pregunta orientadora de esta investigación. Para esto, se siguieron los pasos establecidos por Marton y Booth (1997) comenzando por una lectura reiterada para las entrevistas para extraer citas y así formar la “piscina de datos”, de la cual emergen las “categorías de descripción”. Estas categorías

representan las formas cualitativamente distintas en que se vivencia el fenómeno indagado, desde lo menos complejo a lo más complejo. Las categorías en conjunto conforman el “espacio de resultados”, el cual debe cumplir con los criterios de distinción, jerarquía y parsimonia.

Validez y Confiabilidad

Validez y confiabilidad en estudios con enfoque cuantitativo

La validez del instrumento CURE es abordada ampliamente por Corwin et al. (2014). Para asegurar su validez, se realizó la prueba Shapiro-Wilks para verificar la distribución normal y, debido a que no se cumplió con el supuesto esperado, se decidió utilizar una prueba no paramétrica (Wilcoxon Rank Test).

Validez y confiabilidad en estudios con enfoque cualitativo

En orden de dar respuesta a las amenazas a la validez que presentan los estudios de naturaleza cualitativa, en este estudio se reportan tres maneras para asegurarla. En primer lugar, la validez comunicativa (Guba, 1981), la cual hace referencia a la capacidad del investigador de presentar y convencer a una audiencia de las interpretaciones que hace de los datos obtenidos. En el caso de la presente investigación, ésta fue presentada en las Jornadas Doctorales organizadas por la Facultad de Educación de la Pontificia Universidad Católica de Chile y en el Congreso de la Australian Association for Research in Education (AARE). Es importante mencionar que en ambas instancias se recibió retroalimentación enriquecedora que robusteció el estudio. En segundo lugar, la validez pragmática (Entwistle, 1997) hace referencia a la utilidad y significancia de los resultados para la comunidad. Si bien esto se expande en el apartado Discusión y Conclusiones, es importante introducir que la presente

investigación es útil y significativa tanto para programas de Educación de Instituciones de Educación Superior, como para iniciativas relacionadas a políticas públicas. Finalmente, la validez comparativa (Åkerlind, 2005) la cual busca contrastar los resultados obtenidos con otras publicaciones o investigaciones. Para lo anterior, se puede establecer congruencia entre los resultados obtenidos en el presente estudio y en los reportados por la literatura consultada. Una mayor expansión de este ámbito se presenta en el apartado Discusión y Conclusiones del presente compendio.

Con respecto a la confiabilidad, Åkerlind (2005) establece que ésta posee una estrecha relación con el uso de procedimientos metodológicos adecuados que aseguren consistencia al análisis de los datos. En ambos análisis se siguieron fielmente los pasos establecidos por los autores. Específicamente, se utilizaron los lineamientos entregados por Braun y Clarke (2006) para el análisis temático (página 37 del presente compendio) y los de Åkerlind (2005) y Marton (1986) para el análisis fenomenográfico (página 62 del presente compendio). En cada uno de los artículos se describen los pasos seguidos para la realización de los análisis, de manera de hacer transparente para el lector el cómo fueron llevados a cabo.

Preguntas Orientadoras.

Como se estableció con anterioridad, las preguntas que orientan este estudio son las siguientes:

3. ¿Qué ganancias adquieren los docentes en formación de enseñanza básica luego de realizar un curso de investigación?
4. ¿Qué rol jugará la investigación en la futura labor docente de los profesores en formación de enseñanza básica?

En la siguiente sección se presentan los artículos que responden, cada uno, a estas preguntas.

Publicaciones

Publicación 1

Título:

Developing research skills in pre-service elementary teachers

Estado:

En revisión

Developing research skills in pre-service elementary teachers

It has been claimed that research skills play an important role in the teaching profession: as a powerful tool for teachers to positively impact their own classrooms and school communities. This is important in the context of Chile, where the creation of a new teaching profession emphasizes the importance of the role of research in teacher education and in their professional development. In order to explore how research is taught, this study aims to identify the gains obtained in a research course. 103 pre-service elementary teachers answered the CURE questionnaire (Lopatto et al, 2008) at the beginning and at the end of the course. Additionally, 33 of them participated in an interview to further explore these gains. Results show that students perceive their involvement in research positively, that some research skills are acquired but that these elements should be taught earlier in their degrees. Finally, the practical implications for research in teacher development are discussed.

Keywords: pre-service elementary teachers, research skills, practitioner research

Introduction

There are good arguments for strengthening the development of research skills in teacher education. First, at a societal level, teachers with research skills will be able to better prepare citizens for the challenges of the 21st century. Commentators have claimed that the constant updating of knowledge, technological development and new ways of dealing with information and processes at work require schools to change their teaching practices in order to foster new skills in their students (Binkley et al., 2012; Griffin; McGraw & Care, 2012). Binkley et al. (2012) states that skills such as critical thinking, collaboration, innovation and learning to learn are among those needed for citizens to be prepared for this century's

demands. Developing a solid research background in pre-service teachers will give them, in part, the above-mentioned skills and, thus, they will be prepared to, in turn, teach them to their students. To answer these imperatives and to improve teachers' own teaching practice, a vision has been strongly established of teachers as researchers (Cochrane- Smith, 2005; Tack and Vanderlinde, 2014). This needs to be encouraged from the initial teacher training (LaBoskey, 2004).

A second argument is that research skills will provide multiple benefits at the level of the teaching profession. First, attending research-based courses give students a greater understanding of and sense of self-efficacy regarding research. At the same time, it will help them to develop better attitudes and beliefs about research (van der Linden, Bakx, Ros, Beijaard & van der Bergh, 2015). For example, by acquiring high-level skills, such as academic writing, critical thinking and data analysis (Healey & Jenkins, 2009). Research skills will also allow teachers to identify problems in their classrooms, explore them in depth and find possible research or evidence-based solutions (Ersoy & Çengelci, 2008). Moreover, it will help future teachers to improve their practice by acquiring innovative teaching methods (Joram, 2007). In this way, research is suggested as being one characteristic of the high-quality teacher (Earl & Timperley, 2008), with the potential of positively impacting both the classroom and at the school community level (Harrison, 2013).

Despite the importance of research in teacher education and in teaching professional practice, its development has not been without difficulties.

On the one hand, in terms of teacher education, the role of teacher educators is highly relevant but it also a challenging one to perform. They should be capable of developing research knowledge and skills in their students and supervising them when conducting research (Geerdink, Boei, Willemse, Kools and Van Vlokhoven, 2016). Thus, Livingston,

Call & Morgado (2009) state that teacher educators must be 1) competent research consumers who can use research results in their own work; 2) able to produce research in order to improve and innovate in their own teaching practice and 3) able to stimulate an inquiring attitude in their student teachers. Therefore, they have to develop, at a higher level, the same skills as their students (Willemse & Boei, 2013; Healey et al., 2010). Nevertheless, teacher educators do not always exhibit this knowledge and skills. Consequently, developing pre-service teachers' research skills remains a major challenge, even for some research-based teaching programs, because their implementation of research has been relatively weak (Alvunger & Wahlström, 2017).

On the other hand, in terms of professional teacher practice, in-service teachers claim that there is a lack of support for improving of their research skills (Goodwin & Kosnik, 2013). At the same time, when teachers engage in practitioner research, they feel they are criticized for its quality, the objectives and methods they use (Cochran-Smith, 2005). Furthermore, although the literature claims that both teaching and research must be intertwined in teachers' professional practice (Barak, Gidron & Turniansky, 2010), a traditional approach still prevails: research and teaching are separate worlds, and when researchers intend to collaborate with teachers in research, it tends to be as external experts who take the leading role, reducing the role of teachers (Lunenberg, Dengerink & Korthagen, 2014).

These debates resonate strongly with the current implementation of the new national policy for the teaching profession in Chile. In fact, for many years now the country has been taking measures to improve the quality of the educational system, and improving the teaching profession is key to this. Thus, the new teaching profession (Act 20903) emphasizes that teachers possess skills such as reflection, innovation, collaborative work and research

capabilities. Even though the law establishes them as independent, research acts as a powerful articulator that promotes the development of reflection and critical thinking on teachers' own teaching practice (Henderson, 2012; Hall, 2009; Healey & Jenkins, 2009), collaborative work (Niemi & Nevgi, 2014; Darling-Hammond & Lieberman, 2012) and in general, strengthens and stimulates their professional development (Cartrette & Melroe-Lehrman, 2012; Henderson, 2012; Ballenger, 2009).

Despite the value the new teaching profession in Chile (Act 20.903) places on research skills and its promotion in pre-service education, there is no research to date on this matter. Therefore, studying what pre-service elementary teachers learn about research is both timely and relevant. It will provide evidence for aligning this area of teacher education with the new demands of the Chilean teaching profession. At the same time, it will allow dialogue with the extensive literature in the area, in order to align Chilean pre-service teacher research training with the best international practices. In this way, the purpose of this study is to identify the gains in the understanding of research and the research skills obtained by pre-service elementary teachers after attending a research course.

The rest of the article is structured as follows: the next section describes the methods employed, considering approach, participants, data collection and analysis. Subsequently, findings are presented related to the research benefits and gains obtained by the elementary pre-service teachers. Finally, it concludes by discussing the findings as well as its limitations and implications.

Methods and analysis

This study investigates what gains in understanding research and skills were made by pre-service teachers from a traditional Research Methods in Education course - currently the way

in which Chilean future teachers encounter research preparation. In order to achieve this aim, I conducted a mixed methods study. In this case, the quantitative methods allowed me to understand the perceived gains students reported in a number of dimensions related to research, while qualitative methods provided a deeper understanding of their experience and gains. This was done to achieve a more comprehensive and holistic view of the problem under investigation (Creswell & Plano Clarke, 2011).

The research methods in education course (RMiE)

The Research Methods in Education course is part of an Elementary Teaching Program in a traditional-private Chilean University. It is taught over one semester of the fourth year. Weekly sessions (3 hours) are conducted over a period of sixteen weeks. The purpose of the course is to develop pre-service teachers' research skills through designing and implementing a research project, which emerges from the practicum they are simultaneously enrolled in. The course comprises:

- (1) face to face classes: where the teacher educator and students engage in discussions about research styles, analyses of published articles, academic writing, etc.
- (2) group work: student teachers conduct their small-scale study, working in small groups.
- (3) tutorials: with the teacher educator, refining and carrying out their small-scale research project over its different stages. These tutorials were face-to-face, at regular class times, and online, as a follow-up.

The main assessment task for this course was a research report similar to a research paper. Formative assessment was provided during tutorials and summative assessment was associated with three tasks: writing the introduction section of the report (containing the problem, theoretical framework and literature review), the methods section (containing

research design, participants, instruments of data collection and data analysis) and the full report (containing the previous sections plus the results and discussion).

Participants

A total of 121 pre-service elementary teachers who had enrolled in the RMiE course over three semesters were invited to participate voluntarily in this study. They were all in their fourth year of the Elementary Teaching Program and enrolled in their third teaching practicum at the same time. From this group, 103 answered questionnaires (at the beginning and at the end of the course). 97 of them were females (94,2%) and 6 were males (5,8%); and on average they were 21 years old. In addition, the students were invited to participate in an interview at the end of each semester's course. Thirty-three agreed to participate voluntarily as interviewees (28 females and 5 males). Before answering both the questionnaire or the interviews, participants signed a consent form, previously approved by the University Ethics Committee.

Instruments

A questionnaire and an interview were employed for data gathering. The questionnaire is the Classroom Undergraduate Research Experience (CURE; Lopatto et al., 2008). The first section has 25 questions, for the students to rate themselves for a number of research skills at the beginning of the course and at the end of the course. For the beginning of the semester questionnaire, these questions are in the form of a Likert scale ranging from no experience-skill towards wide experience-skill. For the end of the semester questionnaire, these questions are in the form of a Likert scale ranging from no gain or very small gain to very large gain. The second section presents 19 statements. Students are asked, only at the end of the course,

to rate their perceived gains for achieved understanding of research, and research skills and abilities. These questions are also in the form of a Likert scale ranging from no gain or very small gain to very large gain. In both sections, the aim of the questionnaire is to inquire into students' perceived gains in their understanding of research activities and research skills and abilities. CURE has been widely used in natural sciences degrees (for example, Perera et al., 2017; Ayella & Beck, 2018), and so some items needed to be modified or deleted to be applied in the context of a social science degree, such as education. From the first section the “maintain lab notebook” item was changed to “maintain fieldwork notebook”. Also, the “computational modelling” item was deleted. From the second section the “learning laboratory techniques” item was modified to “learning fieldwork techniques”. References to working in a “lab” were deleted.

Furthermore, semi-structured interviews were also employed for data collection (Venkat, Osman & Booth, 2009). These were conducted once the course had been finished. Questions were directly related to the way participants understood their participation in a small-scale research project, issues related to the course structure and perspectives on the research skills obtained. Interviews were employed to get a deeper insight into the students' experiences and to complement and provide a further understanding of the data obtained from the questionnaire. Interviews were audio recorded and lasted between 20 and 45 minutes. Subsequently, each of them was transcribed verbatim.

Data Analysis

In order to see whether there were differences in gains at the beginning and at the end of the course – first section of the CURE questionnaire – a Wilcoxon Rank Test was performed for each item. This test is appropriate when the normality distribution assumption

has been violated, as it was the case in this study. For the second section of the CURE, aimed at asking students about the gains they perceived in a series of aspects related to research, a simple average score was calculated and then the items were ranked from the items with the most gains to the items with the least gains.

Interviews were analysed using thematic analysis. This was done in order to explore and deepen the perceptions of elementary pre-service teachers about the gains acquired in the RMiE course. The analysis was conducted following the guidelines given by Braun & Clarke (2006). First, the interviews were read repeatedly to gain a familiarity with them. This allowed an initial set of codes to be generated. Then, themes were searched for, reviewed, named, and finally described, each one being supported with pertinent quotes extracted from the interviews. To maintain students' anonymity, interview quotations are presented with the letter 'I' followed by the interview number.

With the aim of facilitating the results description, both quantitative and qualitative results were organized according to three dimensions: conducting a small-scale research project, issues related to the course structure, and perspectives on the research skills obtained.

Results

Quantitative findings

Results show that pre-service elementary teachers reported higher gains with a large effect size in the following items 1) conducting a small scale research project: a project in which the students know the expected outcome, pre ($M=1,83$) and post ($M=3,45$), $T=27$, $p<.05$, $r = -.79$; a project in which only the instructor knows the outcome, pre ($M=2,02$) and post ($M=3,22$), $T=57,5$, $p<.05$, $r = -.71$; a project where no one knows the outcome, pre ($M=1,81$) and post ($M=3,37$), $T=239$, $p<.05$, $r = -.70$; at least one project that is assigned and structured

by the instructor, pre ($M=2,89$) and post ($M=3,8$), $T=413$, $p<.05$, $r = -.52$; a project in which students have some input into the research process and/or what is being studied, pre ($M=2,17$) and post ($M=4,14$), $T=42$, $p<.05$, $r = -.80$; a project entirely of student design, pre ($M=1,85$) and post ($M=4,07$), $T=22,5$, $p<.05$, $r = -.81$; and become responsible for a part of a project, pre ($M=2,44$) and post ($M=4,46$), $T=114$, $p<.05$, $r = -.78$. 2) Course Structure: work as a whole class pre ($M=2,11$) and post ($M=3,27$), $T=235$, $p<.05$, $r = -.62$; work in small groups, pre ($M=3,46$) and post ($M=4,34$), $T=236$, $p<.05$, $r = -.57$; critique the work of other students, pre ($M=2,57$) and post ($M=3,74$), $T=258$, $p<.05$, $r = -.65$; and work on problem sets, pre ($M=2,76$) and post ($M=3,87$), $T=232,5$, $p<.05$, $r = -.66$. 3) Research Skills: read primary scientific literature, pre ($M=3,72$) and post ($M=4,51$), $T=295,5$, $p<.05$, $r = -.58$; write a research proposal, pre ($M=1,88$) and post ($M=4,44$), $T=0$, $p<.05$, $r = -.86$; collect data, pre ($M=3,13$) and post ($M=4,39$), $T=108$, $p<.05$, $r = -.72$; analyse data, pre ($M=3,18$) and post ($M=4,5$), $T=95$, $p<.05$, $r = -.77$; present results orally, pre ($M=2,94$) and post ($M=3,97$), $T=199$, $p<.05$, $r = -.63$; present results in written papers or reports, pre ($M=3,1$) and post ($M=4,39$), $T=35$, $p<.05$, $r = -.76$; and present posters pre ($M=2,09$) and post ($M=3,71$), $T=153$, $p<.05$, $r = -.72$.

Two items reported by pre-service elementary teachers have non-significant gains: (7) Work individually pre ($M=3,41$) and post ($M=3,25$), $T=893,5$, $p>.05$, $r = -.09$ and (24) Maintain fieldwork notebook pre ($M=2,21$) and post ($M=2,59$), $T=264,5$, $p>.05$, $r = -.24$. Finally, the mean decreases significantly in four items from the Course Structure category Course Structure: take a test in class, pre ($M=3,94$) and post ($M=2,44$), $T=138$, $p<.05$, $r = -.63$ (large effect size); read a textbook, pre ($M=4,11$) and post ($M=3,81$), $T=544$, $p<.05$, $r = -.31$ (medium effect size); and listen to lectures, pre ($M=4,42$) and post ($M=4,06$), $T=455$, $p<.05$, $r = -.26$ and discuss reading material in class, pre ($M=4,11$) and post ($M=3,81$),

$T=775$, $p<.05$, $r = -.20$ (both with small effect sizes). Graph 1 shows the gains as perceived by students.

GRAPH 1 HERE

Results from the second section of the questionnaire show that pre-service elementary teachers felt that they acquired research skills in a number of areas. Thus, in a scale from 1 to 5, the items of understanding that scientific assertions require supporting evidence, understanding of how scientists work on real problems, understanding the research process in your field, skill in science writing and learning ethical conduct in your field scored, on average, 4 points or more; the items of ability to integrate theory and practice, tolerance for obstacles faced in the research process, ability to read and understand primary literature, understanding how knowledge is constructed, skill in the interpretation of results, ability to analyze data and other information, self – confidence and skill in how to give an effective oral presentation scored in average between 3,5 and 3,9. Finally, learning fieldwork techniques, clarification of a career path, understanding science, understanding of how scientists think, readiness for a more demanding research and learning to work independently scored, on average, between 3 and 3,4. Table 2 presents these results.

TABLE 2 HERE

Qualitative findings

Firstly, when it comes to students' perceptions of their participation in a small-scale research project, they value the possibility of designing and conducting their own research project. Although they consider the process demanding, they report a sense of deep satisfaction with being able to engaging with research.

It was amazing, I thought think that we would not be able to finish it because it was very demanding. But we did it by ourselves. (I33)

We identified the problem, deepened of it... we designed the methodology, collected and analysed data... we wrote a paper...we felt very proud of ourselves. (I19)

Moreover, they start seeing research as something closer, that could be done by them as teachers, and not exclusively by researchers. In this way, research – in the form of practitioner research, focused on classroom problems – appears closer to their future professional practice.

At the beginning I thought that you had to have a PhD to do one (research), but I have realized that I, as a teacher, can do my small-scale research...that will give me objective evidence of some troubles that my class might be facing... so I will be able to design a plan to improve it and...why not? I can also publish it if it turns out (I28)

Thus, participating in small-scale studies and acquiring research skills will help them solve those educational-related problems and find possible solutions for improving their future professional practice.

It is not only to identify if the students have a good relationship with each other or not ... and that influences... in the end, it influences the learning process. With one simple question I can make a social network map and see who are the most isolated or the most popular children of the class. With that information I can figure a plan and try to improve that (I26)

There is also a change in their vision of the teachers' role. By being able to employ research for addressing classroom problems, they see themselves as moving towards a more professional role.

I feel that with research we move...we move from a mere technical role to a professional one (I29)
Using evidence and taking informed decisions...dealing with problems, facing them in a professional way...I think that my view of the teacher's role has changed so I can change the low value that he/she often has (I8)

Everybody sees teaching as a second-tier job, and it's not like that. This course reinforces to me the complexity of the teaching and learning process and all the things you have to do that goes beyond standing in front of the classroom (I11)

In addition, pre-service elementary teachers begin to understand that their work might not be limited to the classroom, identifying other contexts in which they could work.

Research will allow you to go beyond the classroom. You can work, for example, in universities with other researchers or conduct your own research in order to generate new knowledge (I5)

Secondly, regarding issues with the course structure, there were three important elements for students: application of what was learnt in classes, group work and feedback. In

relation to the first, pre-service elementary teachers valued the way in which classes were organized, as they were able to apply what they learnt.

(In class) we learnt about data collection... about different kind of instruments like questionnaires, focus groups and interviews....and then, for the project, we applied that, we did interviews, and we analysed them (I13)

We had a class where we learnt about the quality of an abstract, and then we analysed them...and we also had to write one for the paper (where we reported the results of our small-scale projects) (I9)

Students valued group work in class,

We worked a lot in small groups...in class and for the project...in the class it was a great task because, for example, we were discussing an article and one of my classmates said something that I had not realized before, so it was very enriching (I9)

and also in between classes. In this case, when they had problems getting together they employed digital technology to facilitate group work.

The work for the project was a little bit difficult because we have to work a lot during the week, so getting together was difficult because we have different classes due to being in different sections.

Anyway, we worked collaboratively and used the drive [google drive], we gave feedback in the drive and that I think that made for a stronger research project and therefore, a stronger research paper (I17)

But some of them state that their personal effort was diluted in the course tasks because all of them were done in small groups

I like to work in small groups, and my group did a great job, but I really don't know if I will be able to do the same by myself. In this course I did not study for a test, I have to apply what I learnt, but, because we worked in groups of 4 or 5, no one told me... like directly 'you are doing a good work' or 'careful, you have a misconception in this...' I think there must be a balance (I32)

Students also state that the constant feedback from the instructor was crucial for the progress of their work, particularly between classes when they continued with their small-scale studies and needed to check whether they were going in the right direction.

The teacher gave us feedback, not just in the face-to-face meetings, but also through the [google] drive and during the week. That help us to work more during the week and we didn't need to wait until the next meeting (I1)

Finally, concerning the development of research skills, students highlighted the use of bibliographic databases, reading scientific articles, using research instruments and writing academically. In the first place, they felt that learning to search for literature in bibliographic databases was very useful. It helped them not only to find papers of interest, but also to optimize their search through the search engines.

They teach us how to use search engines...how it works... we use Web of Science and they teach us all their tools...the use of keywords, how to refine, look topics or papers from a specific country or institution, use of Booleans...now I can look for papers faster (I3)

Using them (bibliographic databases), I spend less time looking for papers than before, when I looked in journals or in google scholar (I6)

In addition, they also mentioned that they had started to use bibliographic databases to look for scientific articles, not only for this course, but also for others they were attending.

And so far, I use databases when we have to use articles to do class work from other courses... I found it very useful. (I4)

Also, they declared that it would be very important and useful to employ bibliographic databases from the beginning of the degree. They feel that it would help to complete higher quality tasks and projects.

This is something that we have to learn from the very beginning of the program (I28)

I think that this is something that must be taught from our first year...if I had known how to use them from the beginning...I don't know...maybe my works and projects might have been better...better papers, better quality (I20)

In the second place, reading articles is another research skill developed by pre-service elementary teachers. They mention that the course gave them better knowledge about how to discern the elements of a good paper.

We did an activity where we had to judge if a paper was good or not. For that, we analyse each section to identify which elements were present or absent. For example, in the methods sections we looked for specific information like if the sample was declared and characterized, the instruments...ehhh... if they were explained ... the way to analyse the data also (I30)

They also learnt specific ways of identifying the usefulness of a particular paper. In this way, focusing on the abstract emerged as a key element.

To see if a paper is useful or not, now I only read the abstract and not the whole paper as I did before (I13)

At the same time, they obtained a new perspective on reading academic papers. They now see them as a source for getting information to deal with problems in their classroom and for updating their teaching strategies

The papers show you what is going on... now...so they show you different ways to deal with topics that can be problems in your classrooms...or they can show you strategies, very good strategies that will improve the way you teach (I1)

In third place, academic writing was another research skill that pre-service elementary teachers valued. Students see this is a different way of writing, which helped them to better organize their ideas. It is recognized as an important gain because it is something difficult for them and sufficient course time was devoted to developing this skill.

This is another way to write, another way to organize ideas...you have to concentrate to do it. I think that I learnt a lot about this, but it was really difficult (I11).

I learnt that when you write you have to start from the general ideas and start to deepen from there. I had the ideas organized in my head, but it was difficult to write them. Anyway, I think that we work a lot on this in classes and for me, it was a huge gain (I33)

Finally, students value having learnt skills associated with developing data gathering instruments and data analysis. They see them useful in their future teaching practice.

I feel that learning how to make interview guidelines goes beyond the research work. It will be useful for other things at school, like preparing the interviews with my children's parents (...)The analysis of the parents' interviews will allow me to identify trends... trends of things that can be happening in my classroom... common children's difficulties or also good things that are going on (I 11)

That specific class...the one about the use of data made a lot of sense to me. The use that the school gave to the children's test is incredible... they use it to improve, not as a final assessment...it's an opportunity for children's learning, to leave no gaps (I 32)

Discussion

These results show that students value their involvement in research. Firstly, in relation to conducting small-scale research, items with higher size effects are related to students taking part in or having most of the responsibility for conducting a research study (a scripted project in which the students know the expected outcome, a project in which students have some input into the research process and/or what is being studied, a project entirely of student design, and being responsible for a part of a project). Also, qualitative results deepen these perspectives, showing that pre-service teachers now feel capable of conducting their own small investigations and see that it will help them to gather evidence to better support their teaching practice. This is consistent with the sense of self-efficacy in relation to research established by Vanderlinde, Bakx, Ros, Beijaard & van der Bergh (2015). At the same time, it is aligned with the idea that research may help teachers to have a positive impact on the educational environments where they work (Ersoy & Çengelci, 2008; Joram, 2007; Earl & Timperley, 2008; Harrison, 2013). Secondly, concerning research skills, students reported higher effect sizes in the items of writing a research proposal, collecting data, presenting results in written papers or reports, and presenting posters. Also, they reported gains in understanding how research works in their area, using research for supporting evidence and

ethical issues related to research. Qualitative research also highlights the acquisition of skills in reading papers, writing academically and in data gathering and analysis. All these elements are in line with studies showing that pre-service teachers must learn about research, not only for using it to improve their teaching practice but also for teaching their own future school students the abilities needed to productively work in contemporary society (Binkley et al., 2012; Griffin; McGraw & Care, 2012). Thirdly, in relation to course structure, items with higher size effects are critiquing the work of other students and working on problem sets. Qualitative results show that students valued applying the knowledge learnt in class, the group work and the feedback provided.

The results obtained are not without limitations. The sample was relatively small and belongs to a single Chilean university; however, it is important to note that these findings do not seek to be generalizable. Instead, I claim that the usefulness of this study lies in exploring how research is part of the teacher education in one program in Chile. This may be relevant in the context of the new teaching profession in Chile (law 20.903), which emphasizes the role of research, and could be used to compare the current situation with other countries' experiences. Indeed, students claim that some of the research skills obtained in this course could be taught earlier in their degrees. Some countries, such as Norway and Finland, give research a leading role in their educational teaching programs' curricula (Afdal & Spernes, 2018; Munthe & Rogne, 2015). In this way, research is progressively incorporated in the pre-service teacher educators' courses. This could be considered for Chilean programs in order to strengthen research formation and respond to demands from students, who would like to see research elements introduced earlier in their degrees.

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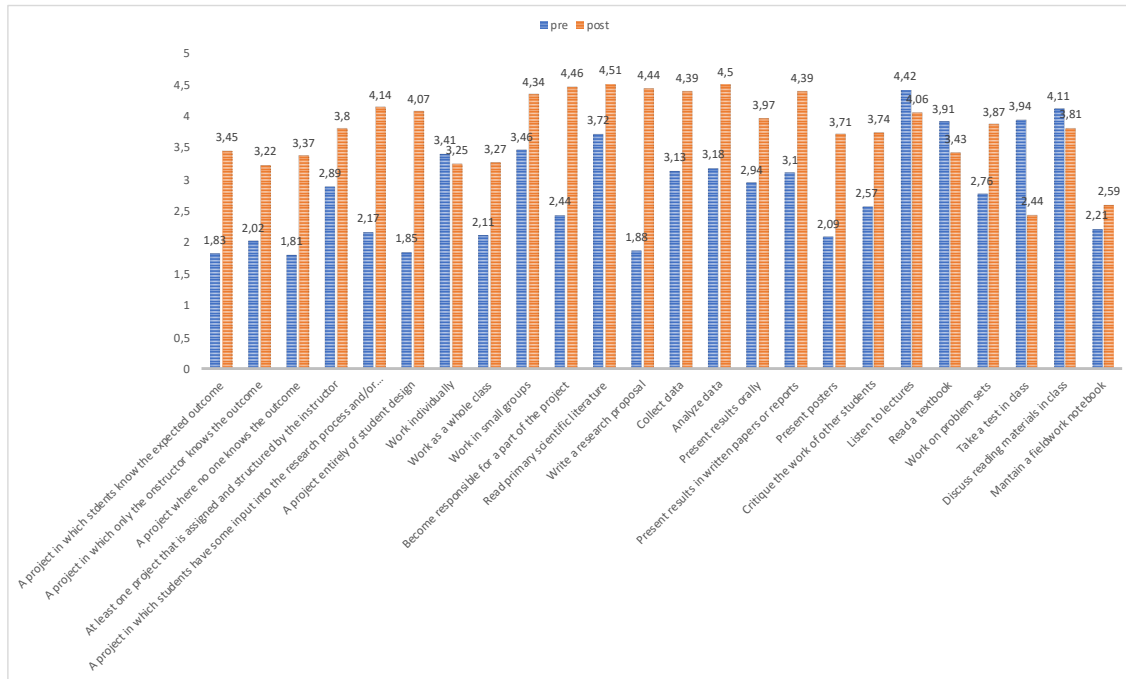
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Graph 1: Pre – post mean responses to gains from the RMiE course experience



Source: own elaboration. Responses were on a scale of 1 (no experience-skill) to 5 (wide experience-skill) for the beginning of the semester survey; and of 1 (no gain or very small gain) to 5 (very large gain) for the end of the semester survey.

Table 1: Mean responses to gains from the RMiE course experience

Item	Mean	SD
Understanding that scientific assertions require supporting evidence	4,2	0,82
Understanding of how scientists work on real problems	4,1	0,91
Understanding of the research process in your field	4,1	0,84
Skill in science writing	4,0	0,93
Learning ethical conduct in your field	4,0	0,96
Ability to integrate theory and practice	3,9	0,85
Tolerance for obstacles faced in the research process	3,9	0,95
Ability to read and understand primary literature	3,8	0,92
Understanding how knowledge is constructed	3,8	0,94
Skill in the interpretation of results	3,8	0,93
Ability to analyze data and other information	3,8	1,01
Self - confidence	3,7	1,01
Skill in how to give an effective oral presentation	3,5	0,98
Learning fieldwork techniques	3,4	1,18
Clarification of a career path	3,3	1,28
Understanding science	3,3	1,14
Understanding of how scientists think	3,2	1,11
Readiness for a more demanding research	3,1	1,03
Learning to work independently	3,0	1,22

Source: own elaboration. Responses were on a scale of 1 (no gain) to 5 (very large gain).

Publicación 2

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Pre-service elementary teachers' perceptions of conducting and consuming research in their future professional practice

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Pre-service elementary teachers' perceptions of conducting and consuming research in their future professional practice

This study aims to explore what pre-service elementary teachers think about the use they will give to research in their future teaching professional practice. Thirty-three pre-service elementary teachers from a Chilean university were interviewed using a phenomenographic approach. Analysis yielded four categories of description, ranging from research as something disconnected from their teaching practice to research as something useful to create educational related knowledge. Three dimensions of variation, namely use of research, foreseen impact and teachers' role in relation to research, provide a richer picture of the outcome space. Results may guide curricular developers to think of the place of research in teacher education, thus have relevant practical implications.

Keywords: pre-service elementary teachers, academic research, practitioner research, phenomenography

Highlights

Developing research knowledge and skills benefits pre-service teachers.

The relationship between research and teaching practice has not been smooth.

The paper explores what uses teachers will give to research in their practice.

It ranges from non-use to creation of educational knowledge.

Results may be used to support teachers to better use research.

Introduction

In Chile, there has been an intense debate on the teaching profession; particularly in the context of the broader discussion about the quality of the educational system. While some

scholars have addressed the professional standards of current teachers (Sisto, Montecinos y Ahumada, 2013), others have highlighted low social valuation (Cabezas & Claro, 2011) or found issues related to teachers' wellbeing, particularly high levels of burnout (Jimenez, Jara & Miranda, 2012). These are themes permanently raised in the public debate.

For some years now, the country has been working on improving the quality of education and there is an awareness that enhancing the teaching profession is central. In this direction, a new national policy for the teaching profession consolidated in 2016, when the Chilean Ministry of Education enacted the N° 20903 Act. The new law addresses three main foci: improvement of working conditions, higher requirements for institutions that provide teacher education degrees and strengthening the continuous professional development. As regards the last focus, teachers are expected to participate in pedagogical innovations, work collaboratively with other teachers to solve educational problems, reflect on their own practice, and engage in pedagogical research (Act N° 20903, 2016).

In light of the above, research is enunciated as a pivotal practice in the teaching profession. This generates questions on how to develop research knowledge and skills as early as initial teacher education, particularly considering that the international literature shows that the relationship between research and teachers' professional practice is problematic (Vanderlinde & Braak, 2010). Indeed, it is hard to transform research findings into teaching innovations. Somehow, teachers perceive research as something far from their practice needs, and they not always have the knowledge and skills to productively use research (Reis-Jorge, 2007).

At present, Chilean teacher education programmes usually include courses on educational research and, in some cases, a research thesis as a capstone activity for graduation. However, we do not know if pre-service teachers perceive this research training

as useful in their future professional practice and whether their ideas are aligned with what the new professional standards expect from them. Therefore, in the context of the current teaching profession reform, conducting research that addresses this issue is relevant. In this article, I study this matter by exploring future teachers' perceptions of research and its foreseen relation with their professional practice.

The rest of the paper is structured as follows: in the next section I describe the international literature on the relationship between educational research and the teaching professional practice. I then present the research design, i.e., approach, participants, context, data collection and analysis. The following section presents findings on teacher education students' perspectives about how research will be useful in their professional practice. The article finishes with a discussion of results.

Educational research and teaching professional practice

Prior studies have stated that developing research knowledge and skills in teacher education benefits pre-service teachers. Furthermore, its fundamental role in the promotion of lifelong learning and professional development has been argued (Waite & Davis, 2006; Cartrette & Melroe-Lehrman, 2012). Research knowledge and skills will also help future teachers identify possible solutions to problems they might face in their own classrooms (Rogers, 2004; Ersoy & Çengelci, 2008, Toom et al., 2010), as well as improve teaching and learning by being in contact with evidence to improve their teaching methods, thus strengthening their practice through the acquisition of new teaching methods (Campbell, McNamara & Gilroy, 2004). Such research expertise will give them confidence in reading research articles and in the acquisition of high level skills e.g., data analysis, writing, collaboration, critical thinking. (Healey & Jenkins, 2009; Hunter, Laursen & Seymour, 2007), additionally contributing to

the analysis of their own development and learning processes (Medwell & Wray; 2014). Therefore, it will have a role in their personal development, professional competence and research competence (Aspfors & Eklund, 2017).

At the same time, it has been claimed that the involvement in research is good for the schools and schools' community promoting the creation of a research culture (Gu & Wang, 2006; Harrison, 2013) that may lead to an evidence based teaching practice. Further, studies suggest that the use of research is one of the characteristics of a high-quality teacher (Earl & Timperley, 2008), allowing them to move from a mere technician role to a more critical and professional one (Postholm, 2009). Thus, the literature presents a high level of agreement that research is important in teacher education and in teachers' professional practice.

Despite the above-mentioned benefits of research in teacher education, the actual relationship between academic research and teachers' professional practice has not been straightforward. This discussion can be traced back to many decades ago (e.g. Corey, 1953; Stenhouse, 1975) with criticism focusing on the minor influence that research conducted by academic researchers has had on teaching practice (Foster, 1999; Hargreaves, 1999). This limited influence has led to both actors feeling frustrated. On the one hand, researchers experience the lack of impact their research has on in-service teachers' teaching practice, even though they disseminate it in practitioners' journals (Vanderlinde & Braak, 2010). On the other, in-service teachers mention that research outcomes are confusing, that few research questions have practical relevance (Vanderlinde & Braak, 2010), that publications are inaccessible for them (Borg, 2010) and the lack of time prevents them from being involved in research (Martell, 2016). Another argument is related to in-service teachers' research training, i.e. teachers do not have the necessary tools and skills to conduct research (Reis-Jorge, 2007), even if they have completed a Master programme (Borg, 2010; Volk, 2010).

While there is relative agreement on the importance of research for both pre-service teacher education and in-service teacher professional practice, there are, at the same time, tensions between research and teachers' professional practice. Consequently, there have been some proposals to make this relation more fluid. In fact, some have stated that academic researchers should establish a closer relationship and work together with in-service teachers (Gu & Wang, 2006; Edwards, Sebba & Rickinson, 2007), for instance, by creating professional learning communities and carrying out design-based research (Vanderlinde & Braak, 2010). Others claim that strengthening 'practitioner research' i.e., research based on problems that practitioners face in a particular context or in their practices (Cochran-Smith & Lytle, 2009), is an empowering way to improve the teaching and learning process besides bringing research closer to the teaching practice (Volk, 2010; Blakemore, 2012). Besides, reporting their own research will allow other teachers to get access to this new knowledge (Altrichter, Posch & Somekh, 2005). This would also allow them to change their role by moving from being constant consumers of knowledge to active producers of it (Cochran-Smith & Lytle, 2009). As described, the literature has suggested alternatives for a better alignment between teachers' professional practice and research. However, it seems said the relationship has not become smooth yet.

The aim of this study is to explore pre-service elementary teachers' perceptions about how useful research will be in their future professional practice. By unpacking pre-service teachers' perspectives, we may add to our understanding of the relationship between educational research and teachers' professional practice. However, it seems that there are no prior studies with this focus, as previous research has focused on pre-service teachers' current perceptions of research (for example, Guilbert, Lane & Van Bergen, 2016) and not on the foreseen impact on their practice. As far as the Chilean context is concerned, this is also a

relevant study, given the teaching profession reform has emphasised the role of research. Hence, at the local level, results are intended to help, with aligning teacher education research training with the new demands of the teaching profession. At an international level, the results may shed light on how to better approach the relation between research and teaching practice, thus overcoming the problems reported in the literature.

Method

Aim and approach

As previously stated, I aim to explore pre-service teachers' perspectives of research and its foreseen relation with their professional practice. I used a phenomenographic approach to identify qualitative variation in the uses that pre-service teachers foresee they will give to research. With Tight (2016) I claim that phenomenography is a key research approach, widely used in higher education. In teacher education, as a disciplinary area within higher education research, there are studies using this approach, mostly focusing on pre-service teachers' conceptions of teaching and learning (e.g. Demir, Sutton-Brown & Czerniak, 2012) and on curricular implementations, e.g. Koenen, Dochy & Berghmans, (2015). I am not aware of any previous phenomenographic study aiming at describing pre-services teachers' perceptions about the role of research in their future professional practice.

Since phenomenography intends to identify the qualitatively different ways in which participants experience, perceive or conceive a phenomenon (Marton, 1986; Marton & Booth, 1997), the option is consistent with the objective of this study, namely, exploring variation on pre-service teachers' perceptions of how research will be useful in their future professional practice. Following guidelines by Marton & Booth (1997) and Tan (2004), I present the found variation as a set of logically related and hierarchically inclusive 'categories

of descriptions'. They represent the progressive awareness of the studied phenomenon, from least complex or advanced to most complex or advanced uses that pre-service teachers foresee they will give to research. All together, these categories conformed the 'outcome space', wherein I followed Marton & Booth's (1997) criteria for its construction: distinction, hierarchy and parsimony.

Participants and data collection

Thirty-three pre-service elementary teachers (28 females and 5 males) from one Chilean university were interviewed. At the time of the interview, their average age was 21 years old and all of them were in their fourth year of the elementary teaching programme. The participants number is greater than Trigwell's (2000) suggestion (fifteen to twenty) because the sample had fairly homogeneous characteristics. Therefore, employing a bigger sample allowed me to find variation in this context, similar to what Çiltas & Isik (2013) did.

All the interviewees had recently completed the Research Seminar course, aimed to develop research knowledge and skills towards understanding and interpreting educational research results. The course lasted one academic semester and it additionally sought to develop research capabilities feasible to be applied in the elementary teachers' professional practice. As part of this course, students conducted a small-scale research on an educational problem associated with their practicum, that should be investigated using tools developed in the course.

Participants were invited to take part voluntarily and signed a consent form. To maintain participants' privacy and anonymity, I present interview quotations with the letter "I" followed by a number.

Semi-structured interviews, usually conducted in phenomenographic studies, were employed for data collection. In fact, this method enables participants to describe and reflect about their own experience of the phenomenon (Prosser, 2000). Questions were directly related to the students' ideas on how they will use research in their future teaching professional practice. Follow-up questions were also employed to deepen reflection on their own awareness of the studied phenomenon. Interviews lasted between 20 and 45 minutes.

Data analysis

Four steps were followed:

First, all interviews were transcribed verbatim and analysed in an iterative manner, reading the transcripts repeatedly (Åkerlind, 2005). This allowed me to identify paragraphs and quotations that refer to the pre-service teachers' different experiences about the phenomenon. As Marton (1986) noted, I maintained an open attitude to find common elements without imposing predetermined categories.

Second, this collection of paragraphs and quotations formed the 'pool of meaning' (Marton, 1986) which, upon analysis, led to the emergence of initial 'categories of descriptions' that revealed the qualitatively different forms in which the phenomenon was experienced.

Third, interviews were read again against the initial set of categories. This allowed me to contrast them against the data and to make adjustments until the meaning system stabilised and formed the 'outcome space' (Marton, 1986). The latter was constructed considering Marton & Booth's (1997) criteria of distinction, hierarchy and parsimony.

Finally, to enrich and make the logical relationship between the categories of description visible, I identified three dimensions of variation (Brew, 2001).

Findings

Four categories of description emerged from the analysis. Elementary pre-service teachers see the usefulness of research in their future teaching practice as follows:

Not useful: as an activity, research is disconnected from the future professional teaching practice.

Research is useful to understand educational related problems and improve professional teaching practice.

Research is useful to solve educational related problems.

Research is useful to create educational related knowledge.

Categories of description are shown below. In developing them, each was sustained by quotations. At the end of each quotation, a number was provided to identify them in the transcripts while keeping interviewees anonymous.

Category A: Not useful: as an activity research is disconnected from future professional teaching practice

In this category, pre-service elementary teachers do not present a clear understanding of the use that they will give to research in their future professional teaching practice. They perceive that even if they learnt about research in the course, they do not clearly understand how to carry it out to solve a problem that may emerge inside their classrooms.

‘If I find a problem... I do not know... I think I would do it using common sense... eh, ... I do not know if... mmm...’ (I7)

‘... I learnt a lot... but I think that I don’t know specifically how to do an investigation to solve that...’ (I3)

They also see research as an activity disconnected from their classroom work, mentioning that it is not an activity they will do being a school teacher.

‘I do not find the sense of doing research while being a teacher...my job will be focused on children’s learning’
(I2)

‘I don’t think I will dedicate myself to doing research... It doesn’t make sense in my teaching job’ (I24)

Besides, pre-service elementary teachers mention that the time required to conduct a research would hinder its implementation.

‘I don’t know if it’s possible to do a research while I’m working, there is no time for that...’ (I1)

In summary, this category of description shows research as an activity participants will not conduct in their future professional practice. This is due to the perceived disconnection between teaching and research and, to some difficulties they perceive in its implementation, such as the lack of time.

Category B: Research is useful to understand educational related problems and improve professional teaching practice

In this category, the use of research focuses on employing others’ research, using educational knowledge from books and/or research articles. This information will help pre-service teachers to accomplish two purposes. The first goal is related to knowing how to deal with educational problems they might find in their classrooms. In this way, using research will

allow them to obtain relevant information, and hence, understand the issues they are facing better.

‘It will help you to identify problems from the reality that you are living inside the classroom. Through theory you will have more background about it, to know more about it’ (I4)

‘This helps us to understand a problem... I mean... if a child has different types of behaviour, we can look for literature that can help us know that behaviour, to know the parameters or our limitations’ (I27)

The second purpose focuses on deepening pre-service teachers’ understanding and updating knowledge on themes related to their teaching work. In fact, they mention that acquiring new knowledge about teaching and learning is relevant to strengthen their teaching professional development.

‘To know the latest (teaching) strategies. I don’t know, teaching and learning strategies as all this evolves increasingly... how a person learns. The, these tools, these new technical strategies will allow you to grow as a teacher’ (I15)

‘I learnt to identify and how to read articles that can improve my professional development as a teacher, you know...’ (I20)

Stated briefly, pre-service elementary teachers perceive research as a tool that, through the existent and novel literature, will help them to understand problems that might arise in their future teaching professional practice. Furthermore, research will be useful to update and deepen emerging teaching strategies that in turn, may improve the learning and teaching process.

Category C: Research is useful to solve educational related problems

In this category, elementary pre-service teachers think research gives them the necessary tools to detect and find solutions to problems in their own classrooms.

‘Research will help me to take care of different problems that I will find in my classroom and it will give me the tools to face and deal with it. I can generate a question and through it, find an answer...it will guide me...so this question will be more mine, will guide me to overcome the problem’ (I12)

From their perspective, research will help them take more informed decisions.

‘You can detect problems in your classroom and be able to find solutions having a theoretical and methodological basis that guide this work’ (I17)

They also mention that research is not necessarily an isolated task. It can also be done in collaboration with other school community members. Collaboration enriches the process as it provides different perspectives and ideas to find solutions.

‘I think research will help me to make pedagogical decisions. I already know that you have to evaluate and from that, make pedagogical decisions. But as a teacher, you can’t stay just with the results. You have to investigate what happened with those results, why they were obtained, get the problem. You can also get other teachers involve, have different opinions and points of view and, from that make decisions and implement solutions. Then evaluate if they were appropriate or not’ (I5)

‘It is not just to know the problem or about the problem. You have to study it, to analyse it, to discuss it with other teachers or heads, working as a team. You have to put it on the table and work on it...and through research, through stages’ (I6)

Knowing about research may allow pre-service elementary teachers to solve problems that go beyond the classroom, but nevertheless, influence them as teachers. As a result, they think in a more systemic way, considering the institutional level. In other words, participants feel research enable them to detect school problems and find possible ways to solve them.

‘Conducting research in the school, not only in a classroom. This can help us to solve problems related to the school resources, or how much the library is being used, why students use it so little, how can we promote its use. Same with workshops among other things’ (I8)

‘... Maybe children from other classes or grades can have the same problems as mine or others’...so maybe with other colleagues we can say that we have a problem that affect the whole school, a school problem so, how can we work together to overcome it and be better. So, in summary, with research you can identify problems but you can also give a solution to them’ (I22)

In this category of description, research is seen as a tool that will help them to solve problems in their classrooms or schools. They also think that through research, they will take more informed decisions. They mention that this activity does not have to be exclusively an individual one, but it can also be conducted in a collaborative way.

Category D: Research is useful to create educational related knowledge

In this category, pre-service elementary teachers perceive research as a powerful activity that will allow them to generate new knowledge.

‘The amount of knowledge is not the only thing that should be considered. How children learn and new effective teaching strategies are also important and I think they are key. Research will allow me to know, prove and why not? may be create some new teaching strategy’ (I10)

‘As a future teacher, I have many ideas about generating changes and something new... so, I need to have foundations to generate changes, to create something new that pursues a change, because our educational system needs to change’ (I25)

They also think that knowledge creation redefines their role, moving from a technician role of being a mere transmitter of knowledge towards a more professional one.

‘A teacher may be able to create knowledge. Sometimes I feel that we are seen as technicians. Well, of course we teach and transmit knowledge, but it does not mean that we are not able to also create something’ (I9)

They also think that research will expand their professional field, opening new horizons that will give them the opportunity to continue working in education in another setting outside the classroom.

‘Many classmates are interested in research. If you want to follow that path and conduct educational research in a University, knowing about research will be very helpful’ (I14)

‘Research gives you new horizons in terms of career opportunities, because the teacher’s work may not necessarily be inside a classroom, but also can be related, for example, to do research in a University’ (I16)

‘A teacher should be seen as more than a simple knowledge broker. I think that a teacher has to understand that he also has the chance to create knowledge’ (I23)

In this category, research is seen as a space for knowledge production as well as an aid to creating new teaching strategies. In addition, research is seen as something that may

take them outside the classroom and connect them with more academic forms of research. This dimension together with the vision of evolution of the teaching role, are the main characteristics conforming this category.

Dimensions of variation between categories of description

The above defined categories of description show their complex relationship through the variation between each of them in accordance to three different aspects as shown in Table 1.

TABLE 1 APPROXIMATELY HERE

Use of Research

In this dimension, the way in which pre-service teachers will use the research knowledge acquired during the course varies between the categories. In category A, this aspect is not present as they do not have a clear understanding of how they can use it in their future teaching practice or because they see both activities independently. Contrary to the above, in category B pre-service teachers appear as consumers of research, using exclusively the work done by other researchers, to understand or deepen certain educational themes. In category C, future teachers complement the aforementioned use with conducting research, applying the knowledge and skills learnt in the course. This is done in order to attempt solving problems that may exist inside their classrooms or schools. Finally, category D goes beyond the classroom and school. The future use of research is linked to the production of new knowledge related, for example, to creating new teaching strategies to afford a specific topic or to move to another setting, e.g. Universities.

Foreseen Impact.

This dimension of variation shows where pre-service teachers' future use of research should impact. In category A there is an absence of impact due to the non-utilisation of research. In Category B the impact will be exclusively in the classroom, where they will understand and deepen different phenomena or learn about new teaching methods to strengthen their teaching practice. In category C, research will not only impact the classroom, but also the school community. Future teachers will try to solve the problems that might emerge in their classrooms, by applying different research techniques to collect data and evaluating whether or not the identified problem improved. They might also participate with their colleagues to improve problems detected in the school community as well. Finally, in category D, besides their own classrooms, this use will impact the school and society, where the knowledge produced by them could cross borders and benefit people outside their school community.

Teachers' role in relation to research

This dimension of variation represents an expanding focus from an inexistent role towards a role as consumer and producer. In category A, no role is seen since research and teaching practice are perceived as disconnected. In category B, the teachers' role is seen as a research consumer. The future teachers will use research produced by others to understand elements related to their practice. In category C, the role advances towards consumer and producer through practitioner research. This implies that future teachers will engage in small scale practitioner research for improving problems emerging from their practice. Finally, in category D future teachers will engage in practitioner research as well as more academic forms of research. In the latter, research may be not focused only on solving classroom issues but inquiring on broader educational themes.

Discussion

In this study, I aimed to unpack what pre-service elementary teachers' perceptions are, regarding how useful research will be in their future professional practice. Four categories of description were identified and research perceived accordingly: (i) research as not useful and disconnected from future professional teaching practice; (ii) research as useful to understand educational related problems and improve professional teaching practice; (iii) research as useful to solve educational related problems; and (iv) research as useful to create educational related knowledge. Three dimensions of variation provided a richer picture of the phenomenon: use of research, foreseen impact and teacher's role in relation to research.

As far as category A is concerned— research is not useful as well as disconnected from teaching practice –, I am not aware of any previous investigations presenting similar results. In this particular group of interviewees, this lack of connection is associated with their perceived role as promoting children's learning – with no reference to research helping them with that aim – and perceived lack of time to do research, which is consistent with what Martell stated (2016). In relation to categories B and C, some elements from prior studies on the benefits of research for pre-service teacher education may be suitable here for discussion. Category B – research to understand educational related problems and improve professional teaching practice – is aligned with previous studies that claim that research allows pre-service teachers to identify and read academic articles (Hunter, Laursen & Seymour's, 2007) and that this will enable them to acquire new teaching methods (Campbell, McNamara & Gilroy, 2004); and deepen specific topics (Aspfors & Elund, 2017) that will strengthen their teaching practice. At the same time, studies have claimed that involvement with research may allow future teachers to detect and solve problems that may arise in their classroom or in their

schools (Rogers, 2004; Ersoy & Çengelci, 2008; Gu & Wang, 2006; Toom et al., 2010; Harrison, 2013). This is consistent with category C – research to solve educational related problems –. Finally, category D – research as something useful to create educational related knowledge – shows that pre-service elementary teachers perceived that research will allow them to move their roles in two ways. First, moving from a technician role to a more professional one (Postholm, 2009), and second, from being consumers of knowledge to producers of knowledge (Cochran-Smith & Lytle, 2009).

As stated, in the new Chilean national policy for the teaching profession, research is positioned as a fundamental practice. As such, teacher education must address this issue. Therefore, it is important to ask whether the categories emerging from this study are in line with this policy. Regarding this matter, category A appears as disaligned since research and practice are perceived disconnected. Category B, on the other hand, is closer to what is expected. It focuses on teachers using knowledge for understanding educational problems and developing their practice. However, research is perceived as something external so teachers emerged as research consumers. The spirit of the new policy promotes agency in research, in other words, advancing from a mere consumers' role. Thus, category C seems to be the most aligned for it highlights the role of research in the improvement of teaching and learning through the detection and resolution of problems that may emerge in the classroom or in the school. It regards the teachers' role as a more active one besides being linked to practitioner research, which, in turn, is at the core of the new law. Lastly, while the most advanced category emerging from the analysis, D paradoxically seems not completely aligned with the new law. This category perceives research as something actively done by teachers, nonetheless, it may bring them to a more academic research space. Thus conceived, research is not necessarily related to improving their own practice.

This study highlights some relevant points that may have important implications for practice. The categories presented in this study may, for example, be used as a model for teacher education programmes to better understand the ideas about research they convey to their students. From this viewpoint, alignment between teacher education programmes and research standards is essential, particularly in Chile, given the new research standards put forth by the new policy for future elementary teachers. Thus, redesigning and strengthening the curriculum in the pursuit of educating high quality teachers (Earl & Timperley, 2008). At the same time, the benefits of research in teacher education – in terms of professionalism, personal development and research competence – have been demonstrated in the literature. Curriculum reform should also consider these positive outcomes.

I am aware this study is not exempt from limitations. The most obvious is that it explores the perceptions of a relatively small group of pre-service teachers from one university only. Yet, results do not claim to be generalizable. Then, as stated before, I would prefer to think of them as conceptual tools that may serve to reflect upon teacher education and align this to the desired learning outcomes of pre-service teachers in relation to research. Further research may explore whether these categories are consistent in other contexts, by studying this phenomenon in pre-service elementary teachers from different universities or countries. Likewise, a follow-up study exploring how these elementary pre-service teachers actually use research once they are already working, could shed light on the field. Indeed, such a follow up may enable us to further understand the complexities informing how teachers use research once they become practitioners. Consequently, it might be possible to delve into elements that promote or hinder the uses of research aligned with the new teacher profession in Chile, as well as with the benefits of engaging elementary school teachers with research, as evidenced by the literature.

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Table 1. Dimensions of variation and their relationship with the categories of description.

	Use of research	Foreseen impact	Teacher role in relation to research
A	Absent	Absent	Absent
B	External	School's Classroom	Consumer
C	External and Internal	School's Classroom and School	Consumer and producer (practitioner research)
D	External and Internal	School's Classroom, School and Society	Consumer and producer (practitioner research and academic research)

Source: own elaboration

Discusión y conclusiones

La presente investigación tuvo como objetivo, por un lado, identificar las ganancias en investigación que obtuvieron los y las docentes en formación de enseñanza básica, luego de haber realizado un curso que aborda de manera directa esta actividad (primera pregunta orientadora). Por otro lado, indagó en la percepción que ellos y ellas tienen sobre el rol que la investigación jugará en su futura labor docente, una vez finalizado el curso (segunda pregunta orientadora). Como principales hallazgos, y en relación con la primera pregunta orientadora, se puede mencionar que los y las docentes en formación percibieron mayores ganancias relacionadas al trabajo en investigación a pequeña escala y al desarrollo de habilidades de investigación (ej: escritura académica). Respecto a la segunda pregunta orientadora, los y las docentes en formación de la carrera de Educación Básica consideran que la investigación les será de utilidad en su futura práctica docente de cuatro maneras: que no les será útil, que les permitirá comprender problemas educativos y mejorar las prácticas docentes, solucionar problemas educativos y, finalmente, crear conocimiento. Lo anterior es complementado por tres dimensiones de variación, que se integran de manera transversal en cada una de las categorías de descripción: uso de la investigación (desde su ausencia en la primera categoría hasta el uso en nuevos contextos o en la elaboración de nuevas estrategias en la última categoría), impacto previsto (desde su ausencia, en la primera categoría, hasta un impacto en la escuela y sociedad, en la última) y, finalmente, el rol del docente en relación a la investigación (desde una ausencia de este rol en la primera categoría, hasta ser investigador académico en la última).

Ambas preguntas poseen especial relevancia con la promulgación, en el año 2016, de la ley N° 20903, la cual entrega a la investigación un importante rol en la labor docente. Lo

anterior establece la necesidad de poder identificar las competencias en investigación que adquieren los y las estudiantes de pedagogía en su proceso de formación inicial y, dependiendo de su estado, poder intencionar su óptimo desarrollo para poder así asegurar que cuenten con los insumos necesarios que les permitan responder a las exigencias actualmente establecidas. Es así como dentro de las ganancias declaradas por los y las docentes en formación de la carrera de pedagogía en educación básica, luego de realizar un curso basado en investigación, se pudo establecer que valoraron las experiencias vividas en el curso, especialmente aquellas relacionadas con la autonomía en la conducción de los proyectos, en donde ellos eran los principales responsables en la totalidad del proceso. Adicionalmente, declaran que, con lo adquirido en el curso, son capaces de poder llevar a cabo investigaciones dentro de su contexto laboral que les permita apoyar y mejorar su labor docente, lo cual robustece su rol docente al ser un agente de mejora, tal como lo señalan Earl y Timperley (2008). En este sentido, los y las docentes en formación presentan un sentido de autoeficacia en relación a la investigación sumado a la presencia significativa de una actitud abierta y positiva en relación a su uso una vez que ejerzan como docentes de aula (Van der linden et al., 2015; Krokfors et al., 2011). Junto a esto, ellos y ellas declaran haber adquirido comprensión sobre cómo funciona la investigación en el ámbito de la Educación y perciben la importancia de contar con evidencia que sustenten los problemas educativos que se detecten para poder así intencionar la toma de decisiones informadas y mejorar así los ambientes de aprendizaje, tal como lo plantean Ersoy y Çengelci, (2008), Earl y Timperley (2008) y Harrison (2013). Otra ganancia enunciada por los y las docentes en formación tiene relación con el cambio de visión sobre la naturaleza del rol docente que experimentaron, transitando de uno meramente técnico a uno más profesional, en donde se complejiza la naturaleza de la profesión, lo cual se condice con Postholm (2009). Finalmente, los y las

docentes perciben que, en su futura labor docente, el uso que le darán a la investigación varía desde el no uso de ésta hasta su uso para la creación de conocimiento (Gray, 2013). Dentro de las razones que esgrimen para el no uso de la investigación se encuentra la desconexión que perciben con la práctica docente (Vanderlinde y Braak, 2010) y por la carencia de tiempo para poder llevarlas a cabo (Martell, 2016). La siguiente categoría muestra que los docentes en formación hacen uso de la investigación para comprender problemas de índole educativo y mejorar su práctica docente, lo cual es consistente con lo mencionado por Hunter, Laursen & Seymour (2007) y Campbell, McNamara y Gilroy (2004). La tercera categoría establece que los docentes en formación utilizarán la investigación para poder resolver problemas educativos que emerjan en sus contextos laborales, a través de la toma de decisiones informadas, lo cual es consistente con lo establecido por Ersoy y Çengelci (2008). Finalmente, la última categoría expresa la transición del rol docente, en donde es posible apreciar la compleja evolución percibida por ellos y ellas, en donde transitan de ser simples consumidores de investigación a ser activos productores de esta (Cochran-Smith y Lytle, 2009).

Implicancias

En esta investigación se señaló previamente que la ley N° 20903, promulgada el año 2016, establece la necesidad de contar con docentes que cuenten con competencias en investigación, estando éstas al servicio de su labor en el ámbito educativo (información más específica en el segundo artículo de este compendio). La mayoría de los docentes que se encuentran en ejercicio en la actualidad cursaron, durante su proceso de formación inicial, uno o dos cursos aislados de investigación, siendo su acercamiento mayor, el proceso de culminación de carrera en donde elaboraron sus tesis conducentes a la obtención del grado

y/o título profesional. Para poder promover la adquisición y desarrollo óptimo de estas competencias, se vuelve necesario trabajarlo de manera holística desde el proceso de formación inicial. Países como Finlandia y Noruega han materializado esta necesidad a través del establecimiento de un plan de estudio de formación inicial docente basado en investigación (ver Jyrhämä et al., 2008; Toom et al, 2010; Krokfors et al., 2011; Munthe y Rogne, 2015; Afdal y Spernes, 2018). Estos programas buscan formar docentes con un foco investigativo en el contexto educativo, colocando el énfasis en el desarrollo de una actitud que indague en su labor docente. Para esto, promueven formar profesionales de la educación autónomos, que consuman y produzcan investigación y que sean capaces de tomar decisiones informadas (Toom et al., 2010). Como forma de responder a lo anterior, sería importante que las carreras de educación de nuestro país atiendan estas competencias de manera similar a la de los países nórdicos, promoviendo así, la formación de profesionales de la educación que posean una sólida base en investigación que respondan a las necesidades y requerimientos establecidos en la actualidad. Un ejemplo de lo anterior es que la carrera de Educación Básica de una universidad particular pagada, la cual es dirigida por la candidata a doctor a cargo de la presente investigación, comenzó el año 2017 su proceso de actualización de plan de estudios el cual será oficial a contar de 2019. Este nuevo plan de estudios aborda la investigación de dos maneras: Por una parte, se caracteriza por ser basado en investigación, teniendo como base el modelo establecido por Healey y Jenkins (2009). De esta manera, cada una de las asignaturas que lo compone tributa a una o más de las cuatro categorías que conforman el modelo asegurando así, su presencia y desarrollo a lo largo de la totalidad de la carrera. Por otra parte, la investigación como “practitioner research” se aborda de manera directa a través de las prácticas educativas, las cuales se caracterizan por ser el eje articulador de la carrera. Específicamente, este eje aborda esta temática de dos maneras. En primer lugar,

y de manera transversal, se encuentra presente la reflexión docente (Medwell y Wray, 2014), siendo ésta una habilidad necesaria para el óptimo desarrollo de un proceso indagativo. En segundo lugar, se promueve explícitamente el desarrollo de la investigación en la práctica (practitioner research) como instancia de mejora y fortalecimiento de la propia práctica en tres de sus asignaturas: una de ellas aborda el estudio de la lección (Lesson Study), la segunda, el autoestudio (Self-study) y finalmente, la tercera, el manejo de datos (basado en el modelo Data Wise). Finalmente, la investigación se encarna a la vez en los dos Seminario de Investigación que posee el Plan de Estudios, los cuales se imparten en cuarto año ya que el trabajo que en ellos se realiza tributa de manera directa al grado académico de Licenciado en Educación. Toda esta reforma realizada desde el núcleo del plan de estudios busca dotar a los futuros docentes de las habilidades y competencias necesarias por poder ser agentes activos, proactivos y responsables en pro de la mejora de la calidad del proceso de enseñanza-aprendizaje de cada uno de sus estudiantes (Westbury et al, 2005).

Implicancias para la Política Pública

A continuación, se presentan implicancias para la política pública en diversas dimensiones.

- Con respecto a la Carrera Docente, materializada a través de la ley 20.903, el presente estudio puede entregar insumos que promoverán lo establecido en la ley, específicamente en el fomento de las capacidades de investigación, innovación y reflexión pedagógica de los docentes a través de sus prácticas de aula. Lo anterior puede materializarse de dos maneras. En primer lugar, integrar la investigación en los planes de estudio de pregrado, ya sea a través de cursos que desarrollen competencias o, a través de planes de estudio basados en investigación (como en Finlandia y Noruega). En segundo lugar, capacitar a los docentes en servicio en el desarrollo de

estas competencias, para que puedan así dar cumplimiento al ámbito explicitado en la ley. Esto puede ser realizado, por ejemplo, en los programas de mentorías o cursos promovidos por el Centro de Perfeccionamiento, Experimentación e Investigaciones Pedagógicas (CPEIP)

- Con respecto a los Estándares Orientadores, que se encuentran en discusión y reformulación en la actualidad, el presente estudio podría enriquecer el debate y dar una orientación de los elementos de esta línea que son necesarios para la formación docente. Con esto, se aseguraría el desarrollo de los conocimientos y competencias en investigación desde la formación inicial. Esto, permitirá que los nuevos docentes entren al aula con una mirada crítica de su labor y propongan y realicen mejoras a los procesos de enseñanza-aprendizaje en base al uso de evidencias.

Limitaciones del estudio

La investigación realizada no está exenta de limitaciones. Una de ellas es que, si bien este estudio no pretende ser generalizable, busca identificar las ganancias en investigación de un grupo relativamente pequeño de docentes en formación, que pertenecen a una única institución de Educación Superior y carrera. Una segunda limitación hace referencia a la metodología utilizada, la cual se centra exclusivamente en el uso de instrumentos de recolección de datos referidos al auto reporte. La decisión de utilizar este tipo de mecanismo responde a poder levantar información que provenga de la riqueza de las diversas percepciones de los y las docentes en formación, basadas en las experiencias que cada uno de ellos experimentó durante el desarrollo del curso.

Proyecciones futuras

Como futura investigación y, respondiendo a la primera limitación mencionada previamente, sería de interés el poder identificar las ganancias que obtengan los docentes en formación de las diversas instituciones de Educación Superior que imparten carreras de Educación. Óptimo sería poder indagar no sólo en los estudiantes de Educación Básica, sino que también incluir a aquellos de Educación de Párvulos, Programas de Formación Pedagógica, Pedagogía media y de diversas disciplinas específicas como, por ejemplo, Pedagogía en Educación Física

También sería de relevancia el poder hacer seguimiento a los y las docentes en formación que participaron en la asignatura, para así indagar en si, una vez trabajando como docentes de aula, mantienen y se materializan las ganancias en investigación declaradas para la presente investigación por cada uno de ellos

Finalmente, sería de interés el poder evaluar el plan de estudios perteneciente a la carrera que dirige la candidata a doctor que realiza la presente investigación, el cual se implementará a partir de 2019, para así poder identificar las ganancias en investigación que obtengan los y las docentes en formación y su correspondiente estado de desarrollo, tal como lo plantean Afdal y Spernes (2018).

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28-Sep-2018

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Yours sincerely,

Sarah Delmas
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Developing research skills in pre-service elementary teachers

It has been claimed that research skills play an important role in the teaching profession: as a powerful tool for teachers to positively impact their own classrooms and school communities. This is important in the context of Chile, where the creation of a new teaching profession emphasizes the importance of the role of research in teacher education and in their professional development. In order to explore how research is taught, this study aims to identify the gains obtained in a research course. 103 pre-service elementary teachers answered the CURE questionnaire (Lopatto et al, 2008) at the beginning and at the end of the course. Additionally, 33 of them participated in an interview to further explore these gains. Results show that students perceive their involvement in research positively, that some research skills are acquired but that these elements should be taught earlier in their degrees. Finally, the practical implications for research in teacher development are discussed.

Keywords: pre-service elementary teachers, research skills, practitioner research

Introduction

There are good arguments for strengthening the development of research skills in teacher education. First, at a societal level, teachers with research skills will be able to better prepare citizens for the challenges of the 21st century. Commentators have claimed that the constant updating of knowledge, technological development and new ways of dealing with information and processes at work require schools to change their teaching practices in order to foster new skills in their students (Binkley et al., 2012; Griffin; McGraw & Care, 2012). Binkley et al. (2012) states that skills such as critical thinking, collaboration, innovation and learning to learn are among those needed for citizens to be prepared for this century’s demands. Developing a solid research background in pre-service teachers will give them, in part, the above-mentioned skills and, thus, they will be prepared to, in turn, teach them to their students. To answer these imperatives and to improve teachers’ own teaching practice, a vision has been strongly

established of teachers as researchers (Cochrane- Smith, 2005; Tack and Vanderlinde, 2014). This needs to be encouraged from the initial teacher training (LaBoskey, 2004).

A second argument is that research skills will provide multiple benefits at the level of the teaching profession. First, attending research-based courses give students a greater understanding of and sense of self-efficacy regarding research. At the same time, it will help them to develop better attitudes and beliefs about research (van der Linden, Bakx, Ros, Beijaard & van der Bergh, 2015). For example, by acquiring high-level skills, such as academic writing, critical thinking and data analysis (Healey & Jenkins, 2009). Research skills will also allow teachers to identify problems in their classrooms, explore them in depth and find possible research or evidence-based solutions (Ersoy & Çengelci, 2008). Moreover, it will help future teachers to improve their practice by acquiring innovative teaching methods (Joram, 2007). In this way, research is suggested as being one characteristic of the high-quality teacher (Earl & Timperley, 2008), with the potential of positively impacting both the classroom and at the school community level (Harrison, 2013).

Despite the importance of research in teacher education and in teaching professional practice, its development has not been without difficulties.

On the one hand, in terms of teacher education, the role of teacher educators is highly relevant but it also a challenging one to perform. They should be capable of developing research knowledge and skills in their students and supervising them when conducting research (Geerdink, Boei, Willemse, Kools and Van Vlokhoven, 2016). Thus, Livingston, Call & Morgado (2009) state that teacher educators must be 1) competent research consumers who can use research results in their own work; 2) able to produce research in order to improve and innovate in their own teaching practice and 3) able to stimulate an inquiring attitude in their student teachers. Therefore, they have

to develop, at a higher level, the same skills as their students (Willemse & Boei, 2013; Healey et al., 2010). Nevertheless, teacher educators do not always exhibit this knowledge and skills. Consequently, developing pre-service teachers' research skills remains a major challenge, even for some research-based teaching programs, because their implementation of research has been relatively weak (Alvunger & Wahlström, 2017).

On the other hand, in terms of professional teacher practice, in-service teachers claim that there is a lack of support for improving of their research skills (Goodwin & Kosnik, 2013). At the same time, when teachers engage in practitioner research, they feel they are criticized for its quality, the objectives and methods they use (Cochran-Smith, 2005). Furthermore, although the literature claims that both teaching and research must be intertwined in teachers' professional practice (Barak, Gidron & Turniansky, 2010), a traditional approach still prevails: research and teaching are separate worlds, and when researchers intend to collaborate with teachers in research, it tends to be as external experts who take the leading role, reducing the role of teachers (Lunenberg, Dengerink & Korthagen, 2014).

These debates resonate strongly with the current implementation of the new national policy for the teaching profession in Chile. In fact, for many years now the country has been taking measures to improve the quality of the educational system, and improving the teaching profession is key to this. Thus, the new teaching profession (Act 20903) emphasizes that teachers possess skills such as reflection, innovation, collaborative work and research capabilities. Even though the law establishes them as independent, research acts as a powerful articulator that promotes the development of reflection and critical thinking on teachers' own teaching practice (Henderson, 2012; Hall, 2009; Healey & Jenkins, 2009), collaborative work (Niemi & Nevgi, 2014;

Darling-Hammond & Lieberman, 2012) and in general, strengthens and stimulates their professional development (Cartrette & Melroe-Lehrman, 2012; Henderson, 2012; Ballenger, 2009).

Despite the value the new teaching profession in Chile (Act 20.903) places on research skills and its promotion in pre-service education, there is no research to date on this matter. Therefore, studying what pre-service elementary teachers learn about research is both timely and relevant. It will provide evidence for aligning this area of teacher education with the new demands of the Chilean teaching profession. At the same time, it will allow dialogue with the extensive literature in the area, in order to align Chilean pre-service teacher research training with the best international practices. In this way, the purpose of this study is to identify the gains in the understanding of research and the research skills obtained by pre-service elementary teachers after attending a research course.

The rest of the article is structured as follows: the next section describes the methods employed, considering approach, participants, data collection and analysis. Subsequently, findings are presented related to the research benefits and gains obtained by the elementary pre-service teachers. Finally, it concludes by discussing the findings as well as its limitations and implications.

Methods and analysis

This study investigates what gains in understanding research and skills were made by pre-service teachers from a traditional Research Methods in Education course - currently the way in which Chilean future teachers encounter research preparation. In order to achieve this aim, I conducted a mixed methods study. In this case, the quantitative methods allowed me to understand the perceived gains students reported in

a number of dimensions related to research, while qualitative methods provided a deeper understanding of their experience and gains. This was done to achieve a more comprehensive and holistic view of the problem under investigation (Creswell & Plano Clarke, 2011).

The research methods in education course (RMiE)

The Research Methods in Education course is part of an Elementary Teaching Program in a traditional-private Chilean University. It is taught over one semester of the fourth year. Weekly sessions (3 hours) are conducted over a period of sixteen weeks. The purpose of the course is to develop pre-service teachers’ research skills through designing and implementing a research project, which emerges from the practicum they are simultaneously enrolled in. The course comprises:

- (1) face to face classes: where the teacher educator and students engage in discussions about research styles, analyses of published articles, academic writing, etc.
- (2) group work: student teachers conduct their small-scale study, working in small groups.
- (3) tutorials: with the teacher educator, refining and carrying out their small-scale research project over its different stages. These tutorials were face-to-face, at regular class times, and online, as a follow-up.

The main assessment task for this course was a research report similar to a research paper. Formative assessment was provided during tutorials and summative assessment was associated with three tasks: writing the introduction section of the report (containing the problem, theoretical framework and literature review), the methods section (containing research design, participants, instruments of data collection

and data analysis) and the full report (containing the previous sections plus the results and discussion).

Participants

A total of 121 pre-service elementary teachers who had enrolled in the RMiE course over three semesters were invited to participate voluntarily in this study. They were all in their fourth year of the Elementary Teaching Program and enrolled in their third teaching practicum at the same time. From this group, 103 answered questionnaires (at the beginning and at the end of the course). 97 of them were females (94,2%) and 6 were males (5,8%); and on average they were 21 years old. In addition, the students were invited to participate in an interview at the end of each semester's course. Thirty-three agreed to participate voluntarily as interviewees (28 females and 5 males). Before answering both the questionnaire or the interviews, participants signed a consent form, previously approved by the University Ethics Committee.

Instruments

A questionnaire and an interview were employed for data gathering. The questionnaire is the Classroom Undergraduate Research Experience (CURE; Lopatto et al., 2008). The first section has 25 questions, for the students to rate themselves for a number of research skills at the beginning of the course and at the end of the course. For the beginning of the semester questionnaire, these questions are in the form of a Likert scale ranging from no experience-skill towards wide experience-skill. For the end of the semester questionnaire, these questions are in the form of a Likert scale ranging from no gain or very small gain to very large gain. The second section presents 19 statements. Students are asked, only at the end of the course, to rate their perceived gains for achieved understanding of research, and research skills and abilities. These questions

are also in the form of a Likert scale ranging from no gain or very small gain to very large gain. In both sections, the aim of the questionnaire is to inquire into students' perceived gains in their understanding of research activities and research skills and abilities. CURE has been widely used in natural sciences degrees (for example, Perera et al., 2017; Ayella & Beck, 2018), and so some items needed to be modified or deleted to be applied in the context of a social science degree, such as education. From the first section the "maintain lab notebook" item was changed to "maintain fieldwork notebook". Also, the "computational modelling" item was deleted. From the second section the "learning laboratory techniques" item was modified to "learning fieldwork techniques". References to working in a "lab" were deleted.

Furthermore, semi-structured interviews were also employed for data collection (Venkat, Osman & Booth, 2009). These were conducted once the course had been finished. Questions were directly related to the way participants understood their participation in a small-scale research project, issues related to the course structure and perspectives on the research skills obtained. Interviews were employed to get a deeper insight into the students' experiences and to complement and provide a further understanding of the data obtained from the questionnaire. Interviews were audio recorded and lasted between 20 and 45 minutes. Subsequently, each of them was transcribed verbatim.

Data Analysis

In order to see to see whether there were differences in gains at the beginning and at the end of the course – first section of the CURE questionnaire – a Wilcoxon Rank Test was performed for each item. This test is appropriate when the normality distribution assumption has been violated, as it was the case in this study. For the second section of

the CURE, aimed at asking students about the gains they perceived in a series of aspects related to research, a simple average score was calculated and then the items were ranked from the items with the most gains to the items with the least gains.

Interviews were analysed using thematic analysis. This was done in order to explore and deepen the perceptions of elementary pre-service teachers about the gains acquired in the RMiE course. The analysis was conducted following the guidelines given by Braun & Clarke (2006). First, the interviews were read repeatedly to gain a familiarity with them. This allowed an initial set of codes to be generated. Then, themes were searched for, reviewed, named, and finally described, each one being supported with pertinent quotes extracted from the interviews. To maintain students' anonymity, interview quotations are presented with the letter 'I' followed by the interview number.

With the aim of facilitating the results description, both quantitative and qualitative results were organized according to three dimensions: conducting a small-scale research project, issues related to the course structure, and perspectives on the research skills obtained.

Results

Quantitative findings

Results show that pre-service elementary teachers reported higher gains with a large effect size in the following items 1) conducting a small scale research project: a project in which the students know the expected outcome, pre ($M=1,83$) and post ($M=3,45$), $T=27$, $p<.05$, $r = -,79$; a project in which only the instructor knows the outcome, pre ($M=2,02$) and post ($M=3,22$), $T=57,5$, $p<.05$, $r = -,71$; a project where no one knows the outcome, pre ($M=1,81$) and post ($M=3,37$), $T=239$, $p<.05$, $r = -,70$; at least one project

that is assigned and structured by the instructor, pre ($M=2,89$) and post ($M=3,8$), $T=413$, $p<.05$, $r = -.52$; a project in which students have some input into the research process and/or what is being studied, pre ($M=2,17$) and post ($M=4,14$), $T=42$, $p<.05$, $r = -.80$; a project entirely of student design, pre ($M=1,85$) and post ($M=4,07$), $T=22,5$, $p<.05$, $r = -.81$; and become responsible for a part of a project, pre ($M=2,44$) and post ($M=4,46$), $T=114$, $p<.05$, $r = -.78$. 2) Course Structure: work as a whole class pre ($M=2,11$) and post ($M=3,27$), $T=235$, $p<.05$, $r = -.62$; work in small groups, pre ($M=3,46$) and post ($M=4,34$), $T=236$, $p<.05$, $r = -.57$; critique the work of other students, pre ($M=2,57$) and post ($M=3,74$), $T=258$, $p<.05$, $r = -.65$; and work on problem sets, pre ($M=2,76$) and post ($M=3,87$), $T=232,5$, $p<.05$, $r = -.66$. 3) Research Skills: read primary scientific literature, pre ($M=3,72$) and post ($M=4,51$), $T=295,5$, $p<.05$, $r = -.58$; write a research proposal, pre ($M=1,88$) and post ($M=4,44$), $T=0$, $p<.05$, $r = -.86$; collect data, pre ($M=3,13$) and post ($M=4,39$), $T=108$, $p<.05$, $r = -.72$; analyse data, pre ($M=3,18$) and post ($M=4,5$), $T=95$, $p<.05$, $r = -.77$; present results orally, pre ($M=2,94$) and post ($M=3,97$), $T=199$, $p<.05$, $r = -.63$; present results in written papers or reports, pre ($M=3,1$) and post ($M=4,39$), $T=35$, $p<.05$, $r = -.76$; and present posters pre ($M=2,09$) and post ($M=3,71$), $T=153$, $p<.05$, $r = -.72$.

Two items reported by pre-service elementary teachers have non-significant gains: (7) Work individually pre ($M=3,41$) and post ($M=3,25$), $T=893,5$, $p>.05$, $r = -.09$ and (24) Maintain fieldwork notebook pre ($M=2,21$) and post ($M=2,59$), $T=264,5$, $p>.05$, $r = -.24$.

Finally, the mean decreases significantly in four items from the Course Structure category Course Structure: take a test in class, pre ($M=3,94$) and post ($M=2,44$), $T=138$, $p<.05$, $r = -.63$ (large effect size); read a textbook, pre ($M=4,11$) and post ($M=3,81$), $T=544$, $p<.05$, $r = -.31$ (medium effect size); and listen to lectures, pre ($M=4,42$) and

post ($M=4,06$), $T=455$, $p<.05$, $r = -,26$ and discuss reading material in class, pre ($M=4,11$) and post ($M=3,81$), $T=775$, $p<.05$, $r = -,20$ (both with small effect sizes). Graph 1 shows the gains as perceived by students.

GRAPH 1 HERE

Results from the second section of the questionnaire show that pre-service elementary teachers felt that they acquired research skills in a number of areas. Thus, in a scale from 1 to 5, the items of understanding that scientific assertions require supporting evidence, understanding of how scientists work on real problems, understanding the research process in your field, skill in science writing and learning ethical conduct in your field scored, on average, 4 points or more; the items of ability to integrate theory and practice, tolerance for obstacles faced in the research process, ability to read and understand primary literature, understanding how knowledge is constructed, skill in the interpretation of results, ability to analyze data and other information, self – confidence and skill in how to give an effective oral presentation scored in average between 3,5 and 3,9. Finally, learning fieldwork techniques, clarification of a career path, understanding science, understanding of how scientists think, readiness for a more demanding research and learning to work independently scored, on average, between 3 and 3,4. Table 2 presents these results.

TABLE 1 HERE

Qualitative findings

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2
3 Firstly, when it comes to students' perceptions of their participation in a small-scale
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5 research project, they value the possibility of designing and conducting their own
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7 research project. Although they consider the process demanding, they report a sense of
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9 deep satisfaction with being able to engaging with research.
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13 It was amazing, I thought think that we would not be able to finish it because it was very
14
15 demanding. But we did it by ourselves. (I33)
16

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18
19 We identified the problem, deepened of it... we designed the methodology, collected and analysed
20
21 data... we wrote a paper...we felt very proud of ourselves. (I19)
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24 Moreover, they start seeing research as something closer, that could be done by them as
25
26 teachers, and not exclusively by researchers. In this way, research – in the form of
27
28 practitioner research, focused on classroom problems – appears closer to their future
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30 professional practice.
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35 At the beginning I thought that you had to have a PhD to do one (research), but I have realized that
36
37 I, as a teacher, can do my small-scale research...that will give me objective evidence of some
38
39 troubles that my class might be facing... so I will be able to design a plan to improve it and...why
40
41 not? I can also publish it if it turns out (I28)
42

43
44 Thus, participating in small-scale studies and acquiring research skills will help them
45
46 solve those educational-related problems and find possible solutions for improving their
47
48 future professional practice.
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51
52 It is not only to identify if the students have a good relationship with each other or not ... and that
53
54 influences... in the end, it influences the learning process. With one simple question I can make a
55
56

social network map and see who are the most isolated or the most popular children of the class.

With that information I can figure a plan and try to improve that (126)

There is also a change in their vision of the teachers' role. By being able to employ research for addressing classroom problems, they see themselves as moving towards a more professional role.

I feel that with research we move...we move from a mere technical role to a professional one (129)

Using evidence and taking informed decisions...dealing with problems, facing them in a professional way...I think that my view of the teacher's role has changed so I can change the low value that he/she often has (18)

Everybody sees teaching as a second-tier job, and it's not like that. This course reinforces to me the complexity of the teaching and learning process and all the things you have to do that goes beyond standing in front of the classroom (111)

In addition, pre-service elementary teachers begin to understand that their work might not be limited to the classroom, identifying other contexts in which they could work.

Research will allow you to go beyond the classroom. You can work, for example, in universities with other researchers or conduct your own research in order to generate new knowledge (15)

Secondly, regarding issues with the course structure, there were three important elements for students: application of what was learnt in classes, group work and feedback. In relation to the first, pre-service elementary teachers valued the way in which classes were organized, as they were able to apply what they learnt.

(In class) we learnt about data collection... about different kind of instruments like questionnaires, focus groups and interviews...and then, for the project, we applied that, we did interviews, and we analysed them (I13)

We had a class where we learnt about the quality of an abstract, and then we analysed them...and we also had to write one for the paper (where we reported the results of our small-scale projects) (I9)

Students valued group work in class,

We worked a lot in small groups...in class and for the project...in the class it was a great task because, for example, we were discussing an article and one of my classmates said something that I had not realized before, so it was very enriching (I9)

and also in between classes. In this case, when they had problems getting together they employed digital technology to facilitate group work.

The work for the project was a little bit difficult because we have to work a lot during the week, so getting together was difficult because we have different classes due to being in different sections.

Anyway, we worked collaboratively and used the drive [google drive], we gave feedback in the drive and that I think that made for a stronger research project and therefore, a stronger research paper (I17)

But some of them state that their personal effort was diluted in the course tasks because all of them were done in small groups

I like to work in small groups, and my group did a great job, but I really don't know if I will be able to do the same by myself. In this course I did not study for a test, I have to apply what I learnt, but, because we worked in groups of 4 or 5, no one told me... like directly 'you are doing a good work' or 'careful, you have a misconception in this...' I think there must be a balance (I32)

Students also state that the constant feedback from the instructor was crucial for the progress of their work, particularly between classes when they continued with their small-scale studies and needed to check whether they were going in the right direction.

The teacher gave us feedback, not just in the face-to-face meetings, but also through the [google] drive and during the week. That help us to work more during the week and we didn't need to wait until the next meeting (I1)

Finally, concerning the development of research skills, students highlighted the use of bibliographic databases, reading scientific articles, using research instruments and writing academically. In the first place, they felt that learning to search for literature in bibliographic databases was very useful. It helped them not only to find papers of interest, but also to optimize their search through the search engines.

They teach us how to use search engines...how it works... we use Web of Science and they teach us all their tools...the use of keywords, how to refine, look topics or papers from a specific country or institution, use of Booleans...now I can look for papers faster (I3)

Using them (bibliographic databases), I spend less time looking for papers than before, when I looked in journals or in google scholar (I6)

In addition, they also mentioned that they had started to use bibliographic databases to look for scientific articles, not only for this course, but also for others they were attending.

And so far, I use databases when we have to use articles to do class work from other courses... I found it very useful. (I4)

Also, they declared that it would be very important and useful to employ bibliographic databases from the beginning of the degree. They feel that it would help to complete higher quality tasks and projects.

This is something that we have to learn from the very beginning of the program (I28)

I think that this is something that must be taught from our first year...if I had known how to use them from the beginning...I don't know...maybe my works and projects might have been better...better papers, better quality (I20)

In the second place, reading articles is another research skill developed by pre-service elementary teachers. They mention that the course gave them better knowledge about how to discern the elements of a good paper.

We did an activity where we had to judge if a paper was good or not. For that, we analyse each section to identify which elements were present or absent. For example, in the methods sections we looked for specific information like if the sample was declared and characterized, the instruments...ehhh... if they were explained ... the way to analyse the data also (I30)

They also learnt specific ways of identifying the usefulness of a particular paper. In this way, focusing on the abstract emerged as a key element.

To see if a paper is useful or not, now I only read the abstract and not the whole paper as I did before (I13)

At the same time, they obtained a new perspective on reading academic papers. They now see them as a source for getting information to deal with problems in their classroom and for updating their teaching strategies

The papers show you what is going on... now...so they show you different ways to deal with topics that can be problems in your classrooms...or they can show you strategies, very good strategies that will improve the way you teach (I1)

In third place, academic writing was another research skill that pre-service elementary teachers valued. Students see this is a different way of writing, which helped them to better organize their ideas. It is recognized as an important gain because it is something difficult for them and sufficient course time was devoted to developing this skill.

This is another way to write, another way to organize ideas...you have to concentrate to do it. I think that I learnt a lot about this, but it was really difficult (I11).

I learnt that when you write you have to start from the general ideas and start to deepen from there. I had the ideas organized in my head, but it was difficult to write them. Anyway, I think that we work a lot on this in classes and for me, it was a huge gain (I33)

Finally, students value having learnt skills associated with developing data gathering instruments and data analysis. They see them useful in their future teaching practice.

I feel that learning how to make interview guidelines goes beyond the research work. It will be useful for other things at school, like preparing the interviews with my children’s parents (...)The analysis of the parents’ interviews will allow me to identify trends... trends of things that can be happening in my classroom... common children’s difficulties or also good things that are going on (I 11)

That specific class...the one about the use of data made a lot of sense to me. The use that the school gave to the children’s test is incredible... they use it to improve, not as a final assessment...it’s an opportunity for children’s learning, to leave no gaps (I 32)

Discussion

These results show that students value their involvement in research. Firstly, in relation to conducting small-scale research, items with higher size effects are related to students taking part in or having most of the responsibility for conducting a research study (a scripted project in which the students know the expected outcome, a project in which students have some input into the research process and/or what is being studied, a project entirely of student design, and being responsible for a part of a project). Also, qualitative results deepen these perspectives, showing that pre-service teachers now feel capable of conducting their own small investigations and see that it will help them to gather evidence to better support their teaching practice. This is consistent with the sense of self-efficacy in relation to research established by Vanderlinde, Bakx, Ros, Beijjaard & van der Bergh (2015). At the same time, it is aligned with the idea that research may help teachers to have a positive impact on the educational environments where they work (Ersoy & Çengelci, 2008; Joram, 2007; Earl & Timperley, 2008; Harrison, 2013). Secondly, concerning research skills, students reported higher effect sizes in the items of writing a research proposal, collecting data, presenting results in written papers or reports, and presenting posters. Also, they reported gains in

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3 understanding how research works in their area, using research for supporting evidence
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5 and ethical issues related to research. Qualitative research also highlights the acquisition
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7 of skills in reading papers, writing academically and in data gathering and analysis. All
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9 these elements are in line with studies showing that pre-service teachers must learn
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11 about research, not only for using it to improve their teaching practice but also for
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13 teaching their own future school students the abilities needed to productively work in
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15 contemporary society (Binkley et al., 2012; Griffin; McGraw & Care, 2012). Thirdly, in
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17 relation to course structure, items with higher size effects are critiquing the work of
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19 other students and working on problem sets. Qualitative results show that students
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21 valued applying the knowledge learnt in class, the group work and the feedback
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23 provided.
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25

26 The results obtained are not without limitations. The sample was relatively small
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28 and belongs to a single Chilean university; however, it is important to note that these
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30 findings do not seek to be generalizable. Instead, I claim that the usefulness of this study
31
32 lies in exploring how research is part of the teacher education in one program in Chile.
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34 This may be relevant in the context of the new teaching profession in Chile (law
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36 20.903), which emphasizes the role of research, and could be used to compare the
37
38 current situation with other countries' experiences. Indeed, students claim that some of
39
40 the research skills obtained in this course could be taught earlier in their degrees. Some
41
42 countries, such as Norway and Finland, give research a leading role in their educational
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44 teaching programs' curricula (Afdal & Spernes, 2018; Munthe & Rogne, 2015). In this
45
46 way, research is progressively incorporated in the pre-service teacher educators'
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48 courses. This could be considered for Chilean programs in order to strengthen research
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50 formation and respond to demands from students, who would like to see research
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52 elements introduced earlier in their degrees.
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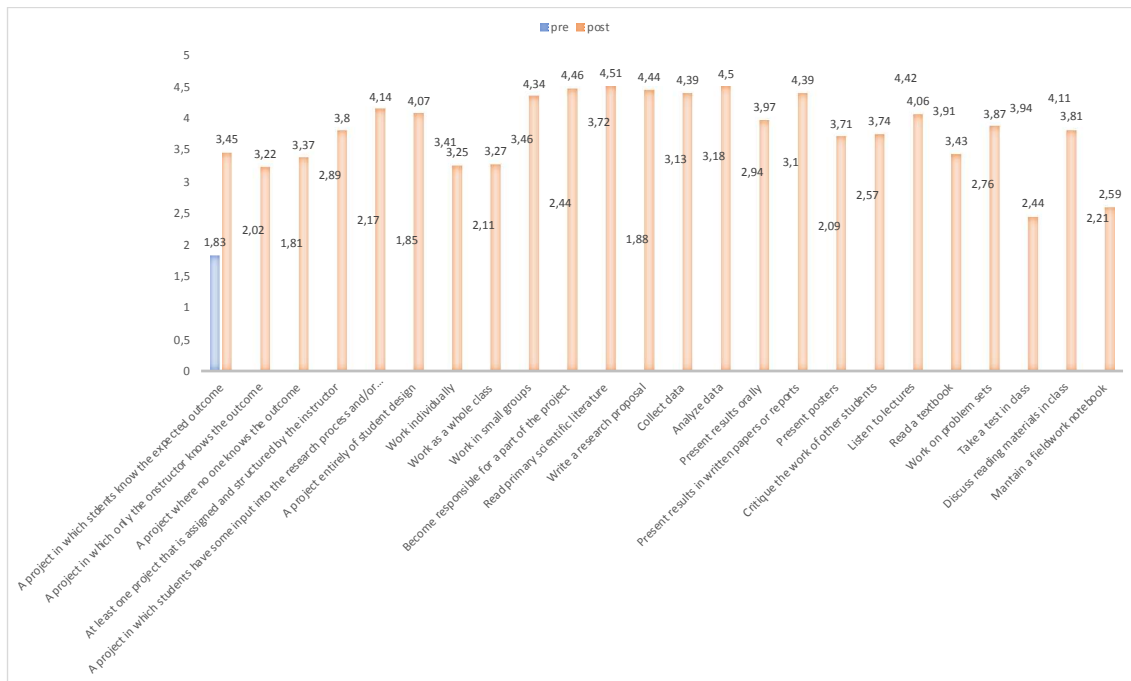
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Table 1: Mean responses to gains from the RMiE course experience

Item	Mean	SD
Understanding that scientific assertions require supporting evidence	4,2	0,82
Understanding of how scientists work on real problems	4,1	0,91
Understanding of the research process in your field	4,1	0,84
Skill in science writing	4,0	0,93
Learning ethical conduct in your field	4,0	0,96
Ability to integrate theory and practice	3,9	0,85
Tolerance for obstacles faced in the research process	3,9	0,95
Ability to read and understand primary literature	3,8	0,92
Understanding how knowledge is constructed	3,8	0,94
Skill in the interpretation of results	3,8	0,93
Ability to analyze data and other information	3,8	1,01
Self - confidence	3,7	1,01
Skill in how to give an effective oral presentation	3,5	0,98
Learning fieldwork techniques	3,4	1,18
Clarification of a career path	3,3	1,28
Understanding science	3,3	1,14
Understanding of how scientists think	3,2	1,11
Readiness for a more demanding research	3,1	1,03
Learning to work independently	3,0	1,22

Responses were on a scale of 1 (no gain) to 5 (very large gain).

Graph 1: Pre – post mean responses to gains from the RMiE course experience

Responses were on a scale of 1 (no experience-skill) to 5 (wide experience-skill) for the beginning of the semester survey; and of 1 (no gain or very small gain) to 5 (very large gain) for the end of the semester survey.



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2 de febrero de 2018, 13:10

Responder a: christopher.day@nottingham.ac.uk

Para: myancovi@uc.cl

02-Feb-2018

Dear Dr Yancovic:

Ref: Pre-service elementary teachers' perceptions of conducting and consuming research in their future professional practice

Our referees have now considered your revised paper and have recommended publication in Teachers and Teaching: Theory and Practice. We are pleased to accept your paper in its current form and it will shortly be forwarded to the publisher for copy editing and typesetting. The reviewer comments are included at the bottom of this letter.

You will receive proofs for checking, and instructions for transfer of copyright in due course. The publisher requests that proofs are checked and returned within 48 hours of receipt and we would appreciate your support in this matter.

Thank you for your contribution to Teachers and Teaching: Theory and Practice; we look forward to receiving further submissions from you.

Sincerely,

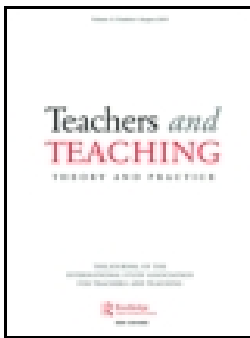
Professor Christopher Day
Editor-in-Chief, Teachers and Teaching: Theory and Practice
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Reviewer(s)' Comments to Author:

Reviewer: 1

Comments to the Author

The manuscript was well revised. Additional literature is included and its implications for teachers' research are taken into account.



Pre-service elementary teachers' perceptions of conducting and consuming research in their future professional practice

Macarena Yancovic-Allen

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Pre-service elementary teachers' perceptions of conducting and consuming research in their future professional practice

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ABSTRACT

This study aims to explore what pre-service elementary teachers think about the use they will give to research in their future teaching professional practice. Thirty-three pre-service elementary teachers from a Chilean university were interviewed using a phenomenographic approach. Analysis yielded four categories of description, ranging from research as something disconnected from their teaching practice to research as something useful to create educational related knowledge. Three dimensions of variation, namely use of research, foreseen impact and teachers' role in relation to research, provide a richer picture of the outcome space. Results may guide curricular developers to think of the place of research in teacher education, and thus have relevant practical implications.

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Pre-service elementary teachers; academic research; practitioner research; phenomenography

Introduction

In Chile, there has been an intense debate on the teaching profession, particularly in the context of the broader discussion about the quality of the educational system. While some scholars have addressed the professional standards of current teachers (Sisto, Montecinos, & Ahumada, 2013), others have highlighted low social valuation (Cabezas & Claro, 2011) or found issues related to teachers' well-being, particularly high levels of burnout (Jiménez Figueroa, Jara Gutiérrez, & Celis, 2012). These are themes permanently raised in the public debate.

For some years now, the country has been working on improving the quality of education and there is an awareness that enhancing the teaching profession is central. In this direction, a new national policy for the teaching profession consolidated in 2016, when the Chilean Ministry of Education enacted the N° 20903 Act. The new law addresses three main foci: improvement of working conditions, higher requirements for institutions that provide teacher education degrees and strengthening the continuous professional development. As regards the last focus, teachers are expected to participate in pedagogical innovations, work collaboratively with other teachers to solve educational problems, reflect on their own practice and engage in pedagogical research (Act N° 20903, 2016).

In the light of the above, research is enunciated as a pivotal practice in the teaching profession. This generates questions on how to develop research knowledge and skills as early as initial teacher education, particularly considering that the international literature shows that the relationship between research and teachers' professional practice is problematic (Vanderlinde & van Braak, 2010). Indeed, it is hard to transform research findings into teaching innovations. Somehow, teachers perceive research as something far from their practice needs, and they not always have the knowledge and skills to productively use research (Reis-Jorge, 2007).

At present, Chilean teacher education programmes usually include courses on educational research and, in some cases, a research thesis as a capstone activity for graduation. However, we do not know if pre-service teachers perceive this research training as useful in their future professional practice and whether their ideas are aligned with what the new professional standards expect from them. Therefore, in the context of the current teaching profession reform, conducting research that addresses this issue is relevant. In this article, I study this matter by exploring future teachers' perceptions of research and its foreseen relation with their professional practice.

The rest of the paper is structured as follows: in the next section, I describe the international literature on the relationship between educational research and the teaching professional practice. I then present the research design, i.e. approach, participants, context, data collection and analysis. The following section presents findings on teacher education students' perspectives about how research will be useful in their professional practice. The article finishes with a discussion of results.

Educational research and teaching professional practice

Prior studies have stated that developing research knowledge and skills in teacher education benefits pre-service teachers. Furthermore, its fundamental role in the promotion of lifelong learning and professional development has been argued (Cartrette & Melroe-Lehrman, 2012; Waite & Davis, 2006). Research knowledge and skills will also help future teachers identify possible solutions to problems they might face in their own classrooms (Ersoy & Çengelci, 2008; Rogers, 2004; Toom et al., 2010), as well as improve teaching and learning by being in contact with evidence to improve their teaching methods, thus strengthening their practice through the acquisition of new teaching methods (Campbell, McNamara, & Gilroy, 2004). Such research expertise will give them confidence in reading research articles and in the acquisition of high-level skills, e.g. data analysis, writing, collaboration, critical thinking. (Healey & Jenkins, 2009; Hunter, Laursen, & Seymour, 2007), additionally contributing to the analysis of their own development and learning processes (Medwell & Wray, 2014). Therefore, it will have a role in their personal development, professional competence and research competence (Aspfors & Elund, 2017).

At the same time, it has been claimed that the involvement in research is good for the schools and schools' community promoting the creation of a research culture (Gu & Wang, 2006; Harrison, 2013) that may lead to an evidence-based teaching practice. Further, studies suggest that the use of research is one of the characteristics of a high-quality teacher (Earl & Timperley, 2008), allowing them to move from a mere technician role to a more critical and professional one (Postholm, 2009). Thus, the literature presents a high level of agreement that research is important in teacher education and in teachers' professional practice.

Despite the above-mentioned benefits of research in teacher education, the actual relationship between academic research and teachers' professional practice has not been straightforward. This discussion can be traced back to many decades ago (e.g. Corey, 1953; Stenhouse, 1975) with criticism focusing on the minor influence that research conducted by academic researchers has had on teaching practice (Foster, 1999; Hargreaves, 1999). This limited influence has led to both actors feeling frustrated. On the one hand, researchers experience the lack of impact their research has on in-service teachers' teaching practice, even though they disseminate it in practitioners' journals (Vanderlinde & van Braak, 2010). On the other, in-service teachers mention that research outcomes are confusing, that few research questions have practical relevance (Vanderlinde & van Braak, 2010), that publications are inaccessible for them (Borg, 2010) and the lack of time prevents them from being involved in research (Martell, 2016). Another argument is related to in-service teachers' research training, i.e. teachers do not have the necessary tools and skills to conduct research (Reis-Jorge, 2007), even if they have completed a Master programme (Borg, 2010; Volk, 2010).

While there is relative agreement on the importance of research for both pre-service teacher education and in-service teacher professional practice, there are, at the same time, tensions between research and teachers' professional practice. Consequently, there have been some proposals to make this relation more fluid. In fact, some have stated that academic researchers should establish a closer relationship and work together with in-service teachers (Edwards, Sebba, & Rickinson, 2007; Gu & Wang, 2006), for instance, by creating professional learning communities and carrying out design-based research (Vanderlinde & van Braak, 2010). Others claim that strengthening 'practitioner research' i.e. research based on problems that practitioners face in a particular context or in their practices (Cochran-Smith & Lytle, 2009), is an empowering way to improve the teaching and learning process besides bringing research closer to the teaching practice (Blakemore, 2012; Volk, 2010). Besides, reporting their own research will allow other teachers to get access to this new knowledge (Altrichter, Posch, & Somekh, 2005). This would also allow them to change their role by moving from being constant consumers of knowledge to active producers of it (Cochran-Smith & Lytle, 2009). As described, the literature has suggested alternatives for a better alignment between teachers' professional practice and research. However, it seems said the relationship has not become smooth yet.

The aim of this study is to explore pre-service elementary teachers' perceptions about how useful research will be in their future professional practice. By unpacking pre-service teachers' perspectives, we may add to our understanding of the relationship between educational research and teachers' professional practice. However, it seems that there are no prior studies with this focus, as previous research has focused on pre-service teachers' current perceptions of research e.g. Guilbert, Lane, & Van Bergen, 2016) and not on the foreseen impact on their practice. As far as the Chilean context is concerned, this is also a relevant study, given the teaching profession reform has emphasised the role of research. Hence, at the local level, results are intended to help, with aligning teacher education research training with the new demands of the teaching profession. At an international level, the results may shed light on how to better approach the relation between research and teaching practice, thus overcoming the problems reported in the literature.

Method

Aim and approach

As previously stated, I aim to explore pre-service teachers' perspectives of research and its foreseen relation with their professional practice. I used a phenomenographic approach to identify qualitative variation in the uses that pre-service teachers foresee they will give to research. With Tight (2016) I claim that phenomenography is a key research approach, widely used in higher education. In teacher education, as a disciplinary area within higher education research, there are studies using this approach, mostly focusing on pre-service teachers' conceptions of teaching and learning (e.g. Demir, Sutton-Brown, & Czerniak, 2012) and on curricular implementations, e.g. Koenen, Dochy, and Berghmans (2015). I am not aware of any previous phenomenographic study aiming at describing pre-services teachers' perceptions about the role of research in their future professional practice.

Since phenomenography intends to identify the qualitatively different ways in which participants experience, perceive or conceive a phenomenon (Marton, 1986; Marton & Booth, 1997), the option is consistent with the objective of this study, namely, exploring variation on pre-service teachers' perceptions of how research will be useful in their future professional practice. Following guidelines by Marton and Booth (1997) and Tan (2004), I present the found variation as a set of logically related and hierarchically inclusive 'categories of descriptions'. They represent the progressive awareness of the studied phenomenon, from least complex or advanced to most complex or advanced uses that pre-service teachers foresee they will give to research. All together, these categories confirmed the 'outcome space', wherein I followed Marton and Booth's (1997) criteria for its construction: distinction, hierarchy and parsimony.

Participants and data collection

Thirty-three pre-service elementary teachers (28 females and 5 males) from one Chilean university were interviewed. At the time of the interview, their average age was 21 years old and all of them were in their fourth year of the elementary teaching programme. The participants' number is greater than Trigwell's (2000) suggestion (15 to 20) because the sample had fairly homogeneous characteristics. Therefore, employing a bigger sample allowed me to find variation in this context, similar to what Çiltas and Isik (2013) did.

All the interviewees had recently completed the Research Seminar course, aimed to develop research knowledge and skills towards understanding and interpreting educational research results. The course lasted one academic semester and it additionally sought to develop research capabilities feasible to be applied in the elementary teachers' professional practice. As part of this course, students conducted a small-scale research on an educational problem associated with their practicum that should be investigated using tools developed in the course.

Participants were invited to take part voluntarily and signed a consent form. To maintain participants' privacy and anonymity, I present interview quotations with the letter 'T' followed by a number.

Semi-structured interviews, usually conducted in phenomegraphic studies, were employed for data collection. In fact, this method enables participants to describe and reflect about their own experience of the phenomenon (Prosser, 2000). Questions were

directly related to the students' ideas on how they will use research in their future teaching professional practice. Follow-up questions were also employed to deepen reflection on their own awareness of the studied phenomenon. Interviews lasted between 20 and 45 min.

Data analysis

Four steps were followed:

- First, all interviews were transcribed verbatim and analysed in an iterative manner, reading the transcripts repeatedly (Åkerlind, 2005). This allowed me to identify paragraphs and quotations that refer to the pre-service teachers' different experiences about the phenomenon. As Marton (1986) noted, I maintained an open attitude to find common elements without imposing predetermined categories.
- Second, this collection of paragraphs and quotations formed the 'pool of meaning' (Marton, 1986) which, upon analysis, led to the emergence of initial 'categories of descriptions' that revealed the qualitatively different forms in which the phenomenon was experienced.
- Third, interviews were read again against the initial set of categories. This allowed me to contrast them against the data and to make adjustments until the meaning system stabilised and formed the 'outcome space' (Marton, 1986). The latter was constructed considering Marton and Booth's (1997) criteria of distinction, hierarchy and parsimony.
- Finally, to enrich and make the logical relationship between the categories of description visible, I identified three dimensions of variation (Brew, 2001).

Findings

Four categories of description emerged from the analysis. Elementary pre-service teachers see the usefulness of research in their future teaching practice as follows:

- (1) Not useful: as an activity, research is disconnected from the future professional teaching practice.
- (2) Research is useful to understand educational related problems and improve professional teaching practice.
- (3) Research is useful to solve educational related problems.
- (4) Research is useful to create educational related knowledge.

Categories of description are shown below. In developing them, each was sustained by quotations. At the end of each quotation, a number was provided to identify them in the transcripts while keeping interviewees anonymous.

Category A: not useful: as an activity research is disconnected from future professional teaching practice

In this category, pre-service elementary teachers do not present a clear understanding of the use that they will give to research in their future professional teaching practice. They perceive that even if they learnt about research in the course, they do not clearly understand how to carry it out to solve a problem that may emerge inside their classrooms.

If I find a problem... I do not know... I think I would do it using common sense... eh, ... I do not know if... mmm... (I7)

... I learnt a lot... but I think that I don't know specifically how to do an investigation to solve that... (I3)

They also see research as an activity disconnected from their classroom work, mentioning that it is not an activity they will do being a school teacher.

I do not find the sense of doing research while being a teacher... my job will be focused on children's learning. (I2)

I don't think I will dedicate myself to doing research... It doesn't make sense in my teaching job. (I24)

Besides, pre-service elementary teachers mention that the time required to conduct a research would hinder its implementation.

I don't know if it's possible to do a research while I'm working, there is no time for that... (I1)

In summary, this category of description shows research as an activity participants will not conduct in their future professional practice. This is due to the perceived disconnection between teaching and research and to some difficulties they perceive in its implementation, such as the lack of time.

Category B: research is useful to understand educational related problems and improve professional teaching practice

In this category, the use of research focuses on employing others' research, using educational knowledge from books and/or research articles. This information will help pre-service teachers accomplish two purposes. The first goal is related to knowing how to deal with educational problems they might find in their classrooms. In this way, using research will allow them to obtain relevant information, and hence understand the issues they are facing better.

It will help you to identify problems from the reality that you are living inside the classroom. Through theory you will have more background about it, to know more about it. (I4)

This helps us to understand a problem... I mean... if a child has different types of behaviour, we can look for literature that can help us know that behaviour, to know the parameters or our limitations. (I27)

The second purpose focuses on deepening pre-service teachers' understanding and updating knowledge on themes related to their teaching work. In fact, they mention that acquiring new knowledge about teaching and learning is relevant to strengthen their teaching professional development.

To know the latest (teaching) strategies. I don't know, teaching and learning strategies as all this evolves increasingly... how a person learns. The, these tools, these new technical strategies will allow you to grow as a teacher. (I15)

I learnt to identify and how to read articles that can improve my professional development as a teacher, you know... (I20)

Stated briefly, pre-service elementary teachers perceive research as a tool that, through the existent and novel literature, will help them understand problems that might arise in their future teaching professional practice. Furthermore, research will be useful to update and

deepen emerging teaching strategies that in turn may improve the learning and teaching process.

Category C: research is useful to solve educational related problems

In this category, elementary pre-service teachers think research gives them the necessary tools to detect and find solutions to problems in their own classrooms.

Research will help me to take care of different problems that I will find in my classroom and it will give me the tools to face and deal with it. I can generate a question and through it, find an answer...it will guide me...so this question will be more mine, will guide me to overcome the problem. (I12)

From their perspective, research will help them take more informed decisions.

You can detect problems in your classroom and be able to find solutions having a theoretical and methodological basis that guide this work. (I17)

They also mention that research is not necessarily an isolated task. It can also be done in collaboration with other school community members. Collaboration enriches the process as it provides different perspectives and ideas to find solutions.

I think research will help me to make pedagogical decisions. I already know that you have to evaluate and from that, make pedagogical decisions. But as a teacher, you can't stay just with the results. You have to investigate what happened with those results, why they were obtained, get the problem. You can also get other teachers involve, have different opinions and points of view and, from that make decisions and implement solutions. Then evaluate if they were appropriate or not. (I5)

It is not just to know the problem or about the problem. You have to study it, to analyse it, to discuss it with other teachers or heads, working as a team. You have to put it on the table and work on it...and through research, through stages. (I6)

Knowing about research may allow pre-service elementary teachers to solve problems that go beyond the classroom, but nevertheless influence them as teachers. As a result, they think in a more systemic way, considering the institutional level. In other words, participants feel research enables them to detect school problems and find possible ways to solve them.

Conducting research in the school, not only in a classroom. This can help us to solve problems related to the school resources, or how much the library is being used, why students use it so little, how can we promote its use. Same with workshops among other things. (I8)

... Maybe children from other classes or grades can have the same problems as mine or others'... so maybe with other colleagues we can say that we have a problem that affect the whole school, a school problem so, how can we work together to overcome it and be better. So, in summary, with research you can identify problems but you can also give a solution to them. (I22)

In this category of description, research is seen as a tool that will help them solve problems in their classrooms or schools. They also think that through research, they will take more informed decisions. They mention that this activity does not have to be exclusively an individual one, but it can also be conducted in a collaborative way.

Category D: research is useful to create educational related knowledge

In this category, pre-service elementary teachers perceive research as a powerful activity that will allow them to generate new knowledge.

The amount of knowledge is not the only thing that should be considered. How children learn and new effective teaching strategies are also important and I think they are key. Research will allow me to know, prove and why not? may be create some new teaching strategy. (I10)

As a future teacher, I have many ideas about generating changes and something new ... so, I need to have foundations to generate changes, to create something new that pursues a change, because our educational system needs to change. (I25)

They also think that knowledge creation redefines their role, moving from a technician role of being a mere transmitter of knowledge towards a more professional one.

A teacher may be able to create knowledge. Sometimes I feel that we are seen as technicians. Well, of course we teach and transmit knowledge, but it does not mean that we are not able to also create something. (I9)

They also think that research will expand their professional field, opening new horizons that will give them the opportunity to continue working in education in another setting outside the classroom.

Many classmates are interested in research. If you want to follow that path and conduct educational research in a University, knowing about research will be very helpful. (I14)

Research gives you new horizons in terms of career opportunities, because the teacher's work may not necessarily be inside a classroom, but also can be related, for example, to do research in a University. (I16)

A teacher should be seen as more than a simple knowledge broker. I think that a teacher has to understand that he also has the chance to create knowledge. (I23)

In this category, research is seen as a space for knowledge production as well as an aid to creating new teaching strategies. In addition, research is seen as something that may take them outside the classroom and connect them with more academic forms of research. This dimension together with the vision of evolution of the teaching role is the main characteristic confirming this category.

Dimensions of variation between categories of description

The above-defined categories of description show their complex relationship through the variation between each of them in accordance to three different aspects as shown in Table 1.

Use of research

In this dimension, the way in which pre-service teachers will use the research knowledge acquired during the course varies between the categories. In category A, this aspect is not present as they do not have a clear understanding of how they can use it in their future teaching practice or because they see both activities independently. Contrary to the above,

Table 1. Dimensions of variation and their relationship with the categories of description.

	Use of research	Foreseen impact	Teacher role in relation to research
A	Absent	Absent	Absent
B	External	School's classroom	Consumer
C	External and internal	School's classroom and school	Consumer and producer (practitioner research)
D	External and internal	School's classroom, school and society	Consumer and producer (practitioner research and academic research)

in category B, pre-service teachers appear as consumers of research, using exclusively the work done by other researchers, to understand or deepen certain educational themes. In category C, future teachers complement the aforementioned use with conducting research, applying the knowledge and skills learnt in the course. This is done in order to attempt solving problems that may exist inside their classrooms or schools. Finally, category D goes beyond the classroom and school. The future use of research is linked to the production of new knowledge related, for example, to creating new teaching strategies to afford a specific topic or to move to another setting, e.g. Universities.

Foreseen impact

This dimension of variation shows where pre-service teachers' future use of research should impact. In category A, there is an absence of impact due to the non-utilisation of research. In Category B, the impact will be exclusively in the classroom, where they will understand and deepen different phenomena or learn about new teaching methods to strengthen their teaching practice. In category C, research will not only impact the classroom, but also the school community. Future teachers will try to solve the problems that might emerge in their classrooms, by applying different research techniques to collect data and evaluating whether or not the identified problem improved. They might also participate with their colleagues to improve problems detected in the school community as well. Finally, in category D, besides their own classrooms, this use will impact the school and society, where the knowledge produced by them could cross borders and benefit people outside their school community.

Teachers' role in relation to research

This dimension of variation represents an expanding focus from an inexistent role towards a role as consumer and producer. In category A, no role is seen since research and teaching practice are perceived as disconnected. In category B, the teachers' role is seen as a research consumer. The future teachers will use research produced by others to understand elements related to their practice. In category C, the role advances towards consumer and producer through practitioner research. This implies that future teachers will engage in small-scale practitioner research for improving problems emerging from their practice. Finally, in category D, future teachers will engage in practitioner research as well as more academic forms of research. In the latter, research may be not focused only on solving classroom issues but inquiring on broader educational themes.

Discussion

In this study, I aimed to unpack what pre-service elementary teachers' perceptions are, regarding how useful research will be in their future professional practice. Four categories of description were identified and research perceived accordingly: (i) research as not useful and disconnected from future professional teaching practice; (ii) research as useful to understand educational related problems and improve professional teaching practice; (iii) research as useful to solve educational related problems; and (iv) research as useful to create educational related knowledge. Three dimensions of variation provided a richer picture of the phenomenon: use of research, foreseen impact and teacher's role in relation to research.

As far as category A is concerned – research is not useful as well as disconnected from teaching practice – I am not aware of any previous investigations presenting similar results.

In this particular group of interviewees, this lack of connection is associated with their perceived role as promoting children's learning – with no reference to research helping them with that aim – and perceived lack of time to do research, which is consistent with what Martell stated (2016). In relation to categories B and C, some elements from prior studies on the benefits of research for pre-service teacher education may be suitable here for discussion. Category B – research to understand educational related problems and improve professional teaching practice – is aligned with previous studies that claim that research allows pre-service teachers to identify and read academic articles (Hunter et al., 2007) and that this will enable them to acquire new teaching methods (Campbell et al., 2004) and deepen specific topics (Aspfors & Elund, 2017) that will strengthen their teaching practice. At the same time, studies have claimed that involvement with research may allow future teachers to detect and solve problems that may arise in their classroom or in their schools (Ersoy & Çengelci, 2008; Gu & Wang, 2006; Harrison, 2013; Rogers, 2004; Toom et al., 2010). This is consistent with category C – research to solve educational related problems –. Finally, category D – research as something useful to create educational related knowledge – shows that pre-service elementary teachers perceived that research will allow them to move their roles in two ways. First, moving from a technician role to a more professional one (Postholm, 2009), and second, from being consumers of knowledge to producers of knowledge (Cochran-Smith & Lytle, 2009).

As stated, in the new Chilean national policy for the teaching profession, research is positioned as a fundamental practice. As such, teacher education must address this issue. Therefore, it is important to ask whether the categories emerging from this study are in line with this policy. In regard to this matter, category A appears as disaligned since research and practice are perceived disconnected. Category B, on the other hand, is closer to what is expected. It focuses on teachers using knowledge for understanding educational problems and developing their practice. However, research is perceived as something external so teachers emerged as research consumers. The spirit of the new policy promotes agency in research, in other words, advancing from a mere consumers' role. Thus, category C seems to be the most aligned for it highlights the role of research in the improvement of teaching and learning through the detection and resolution of problems that may emerge in the classroom or in the school. It regards the teachers' role as a more active one besides being linked to practitioner research, which, in turn, is at the core of the new law. Lastly, while the most advanced category emerging from the analysis, D paradoxically seems not completely aligned with the new law. This category perceives research as something actively done by teachers; nonetheless, it may bring them to a more academic research space. Thus conceived, research is not necessarily related to improving their own practice.

This study highlights some relevant points that may have important implications for practice. The categories presented in this study may, for example, be used as a model for teacher education programmes to better understand the ideas about research they convey to their students. From this viewpoint, alignment between teacher education programmes and research standards is essential, particularly in Chile, given the new research standards put forth by the new policy for future elementary teachers, thus redesigning and strengthening the curriculum in the pursuit of educating high-quality teachers (Earl & Timperley, 2008). At the same time, the benefits of research in teacher education – in terms of professionalism, personal development and research competence – have been demonstrated in the literature. Curriculum reform should also consider these positive outcomes.

I am aware this study is not exempt from limitations. The most obvious is that it explores the perceptions of a relatively small group of pre-service teachers from one university only. Yet, results do not claim to be generalisable. Then, as stated before, I would prefer to think of them as conceptual tools that may serve to reflect upon teacher education and align this to the desired learning outcomes of pre-service teachers in relation to research.

Further research may explore whether these categories are consistent in other contexts, by studying this phenomenon in pre-service elementary teachers from different universities or countries. Likewise, a follow-up study exploring how these elementary pre-service teachers actually use research once they are already working could shed light on the field. Indeed, such a follow-up may enable us to further understand the complexities informing how teachers use research once they become practitioners. Consequently, it might be possible to delve into elements that promote or hinder the uses of research aligned with the new teacher profession in Chile, as well as with the benefits of engaging elementary school teachers with research, as evidenced by the literature.

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Encuesta Inicio de Semestre

Por favor contesta las siguientes preguntas:

Nombre	
Número de alumno/a	

Por favor, lee los elementos aparecen en la siguiente tabla. Para cada uno, entrega un estimado de tu nivel actual de experiencia o habilidad (usando las alternativas que van desde ninguna experiencia/habilidad hasta amplia experiencia/habilidad). Tu nivel actual de experiencia o habilidad puede ser el resultado de cursos en la enseñanza media o en la universidad, o puede ser resultado de otras experiencias, tales como trabajos como ayudante o programas especiales (por ejemplo, investigación de pregrado)

	Ninguna experiencia/habilidad	Poca experiencia/habilidad	Algo de experiencia/Habilidad	Mucha experiencia /habilidad	Amplia experiencia /habilidad
Proyectos en los cuales los estudiantes conocen de antemano el resultado esperado					
Experiencias de campo o proyectos en los cuales solo el/la profesor/a conoce de antemano el resultado					
Experiencias de campo o proyectos en los que nadie sabe el resultado de antemano					
Proyectos asignados y estructurados por el/la profesor/a					
Proyectos en los cuales los estudiantes tienen alguna capacidad de decisión sobre el proceso de investigación y/o lo que se está estudiando					
Proyectos diseñado enteramente por los estudiantes					
Trabajo académico individual					
Trabajo académico como curso completo					
Trabajo académico en grupos pequeños					
Hacerse responsable por una parte de un proyecto					
Leer literatura científica primaria (artículos de investigación)					
Escribir una propuesta de investigación					
Recolectar datos					
Analizar datos					
Presentar resultados de una investigación oralmente					
Presentar resultados de investigación por escrito a través de artículos o informes					
Presentar posters					
Criticar el trabajo de otros estudiantes					
Escuchar clases					
Leer libros de texto (el libro central de un curso)					
Trabajo académico en base a resolución de problemas					
Realizar exámenes en clase					
Discutir material de lectura en clases					
Generar y mantener notas de laboratorio					

Encuesta Fin de Semestre

Por favor contesta las siguientes preguntas:

Nombre	
Número de alumno/a	

Por favor, selecciona la alternativa que mejor refleje cuanto ganaste en aprendizaje, a partir de tu experiencia en este curso, para cada uno de los elementos mencionados. Las posibilidades van desde “una ganancia muy pequeña o ninguna” hasta “una ganancia muy grande”. Algunos de los elementos mencionados puede que no hayan ocurrido en el curso. Si esto sucede con algunos de los ítems, por favor, selecciona la opción “no aplica”.

	Una ganancia muy pequeña o ninguna	Una pequeña ganancia	Una ganancia moderada	Una ganancia grande	Una ganancia muy grande	No aplica
Proyectos en los cuales los estudiantes conocen de antemano el resultado esperado						
Experiencias de campo o proyectos en los cuales solo el/la profesor/a conoce de antemano el resultado						
Experiencias de campo o proyectos en los que nadie sabe el resultado de antemano						
Proyectos asignados y estructurados por el/la profesor/a						
Proyectos en los cuales los estudiantes tienen alguna capacidad de decisión sobre el proceso de investigación y/o lo que se está estudiando						
Proyectos diseñado enteramente por los estudiantes						
Trabajo académico individual						
Trabajo académico como curso completo						
Trabajo académico en grupos pequeños						
Hacerse responsable por una parte de un proyecto						
Leer literatura científica primaria (artículos de investigación)						
Escribir una propuesta de investigación						
Recolectar datos						
Analizar datos						
Presentar resultados de investigación oralmente						
Presentar resultados de investigación por escrito a través de artículos o informes						
Presentar posters						
Criticar el trabajo de otros estudiantes						
Escuchar clases						
Leer libros de texto (el libro central de un curso)						
Trabajo académico en base a resolución de problemas						
Realizar exámenes en clase						
Discutir material de lectura en clases						
Generar y mantener notas de laboratorio						

En esta sección de la encuesta te pedimos que consideres los beneficios que tu percibes obtuviste al participar en el curso.

	Una ganancia muy pequeña o ninguna	Una pequeña ganancia	Una ganancia moderada	Una ganancia grande	Una ganancia muy grande
Clarificación de mis opciones de carrera					
Habilidades para la interpretación de resultados					
Tolerancia a obstáculos encontrados en el proceso de investigación					
Sentirse listo para investigación más demandante					
Comprensión sobre cómo se construye el conocimiento					
Comprensión sobre cómo se investiga en tu área					
Habilidad para integrar teoría y práctica					
Comprender cómo los investigadores trabajan en problemas reales					
Comprender que las afirmaciones de las ciencias sociales requieren evidencia que las apoye					
Habilidad para analizar datos y otros tipos de información					
Comprender las ciencias sociales					
Aprender como trabajar éticamente en mi área					
Aprender técnicas de campo					
Habilidad para leer y entender literatura primaria					
Habilidad para hacer presentaciones orales efectivas					
Habilidad para escribir académicamente					
Auto-confianza en el proceso de investigación					
Comprensión sobre como piensan los científicos sociales					
Aprender a trabajar individualmente					

```

EXAMINE VARIABLES=PRE1
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE1	100	100,0%	0	0,0%	100	100,0%

Descriptivos

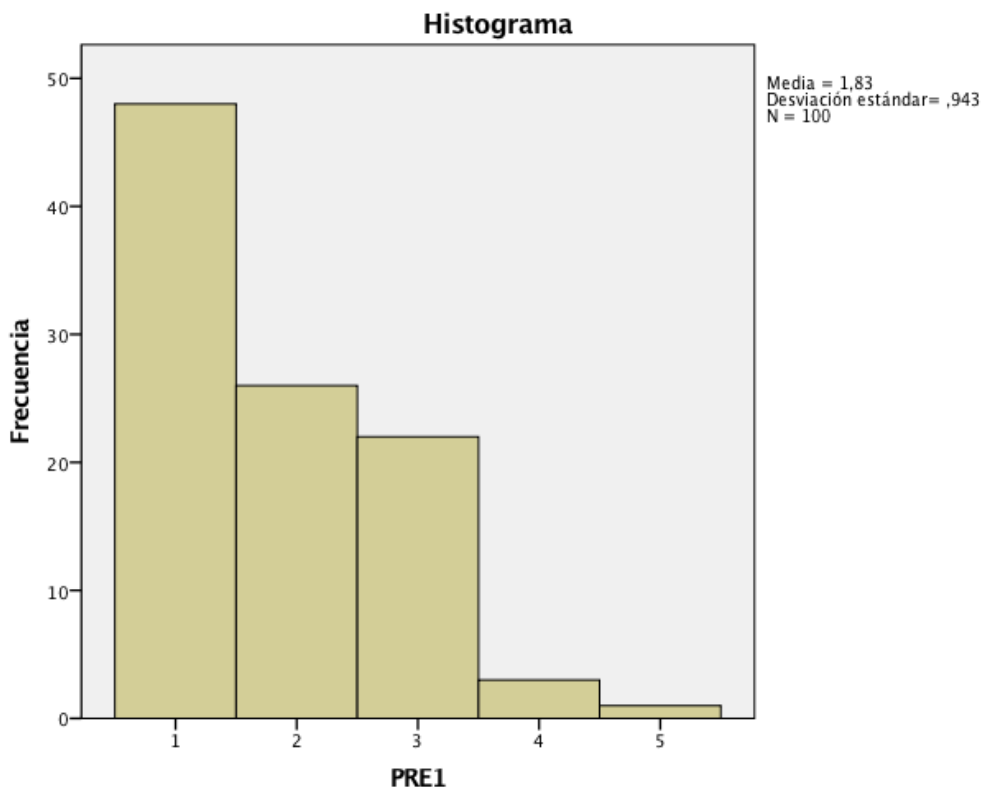
			Estadístico	Error estándar
PRE1	Media		1,83	,094
	95% de intervalo de confianza para la media	Límite inferior	1,64	
		Límite superior	2,02	
	Media recortada al 5%		1,76	
	Mediana		2,00	
	Varianza		,890	
	Desviación estándar		,943	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		,865	,241
	Curtosis		,044	,478

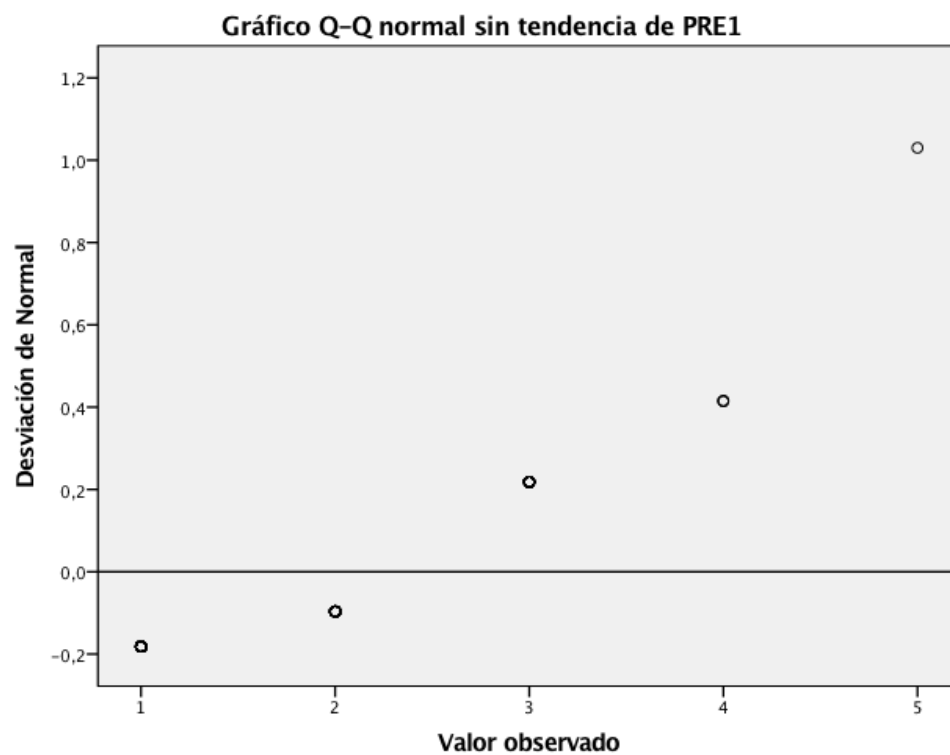
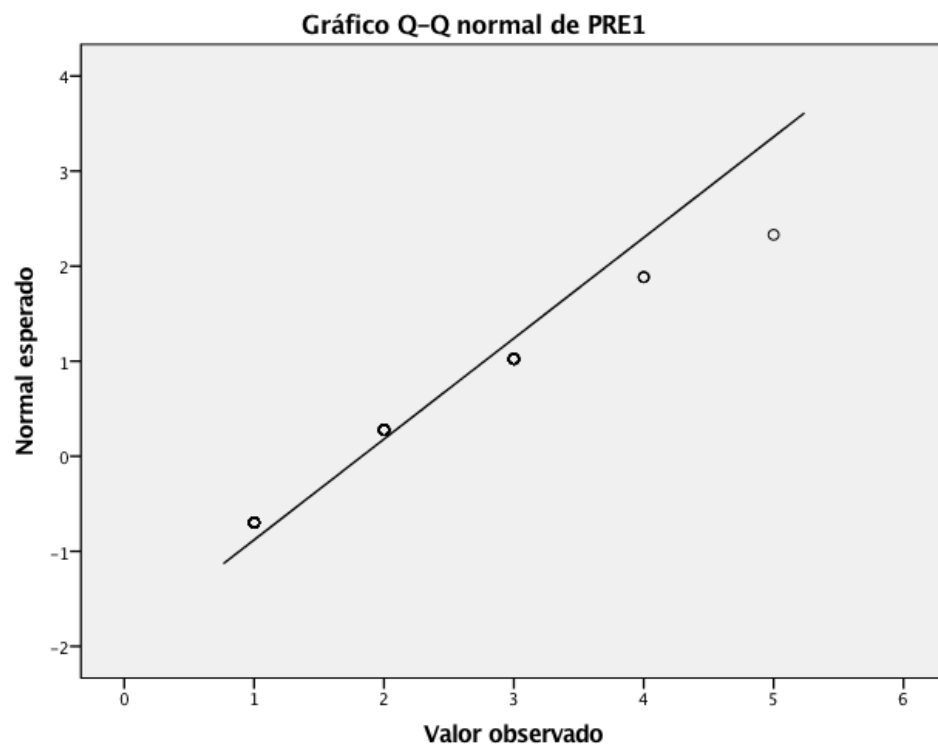
Pruebas de normalidad

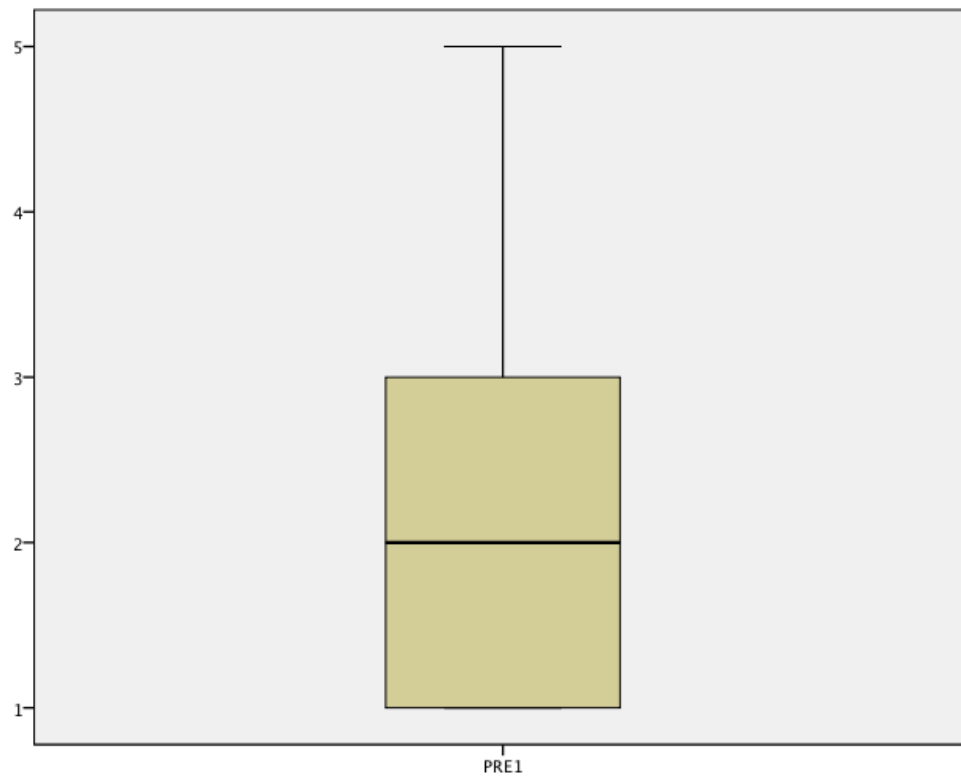
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
PRE1	,291	100	,000	,794	100	,000

a. Corrección de significación de Lilliefors

PRE1







```
EXAMINE VARIABLES=POST1
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 1	89	89,0%	11	11,0%	100	100,0%

Descriptivos

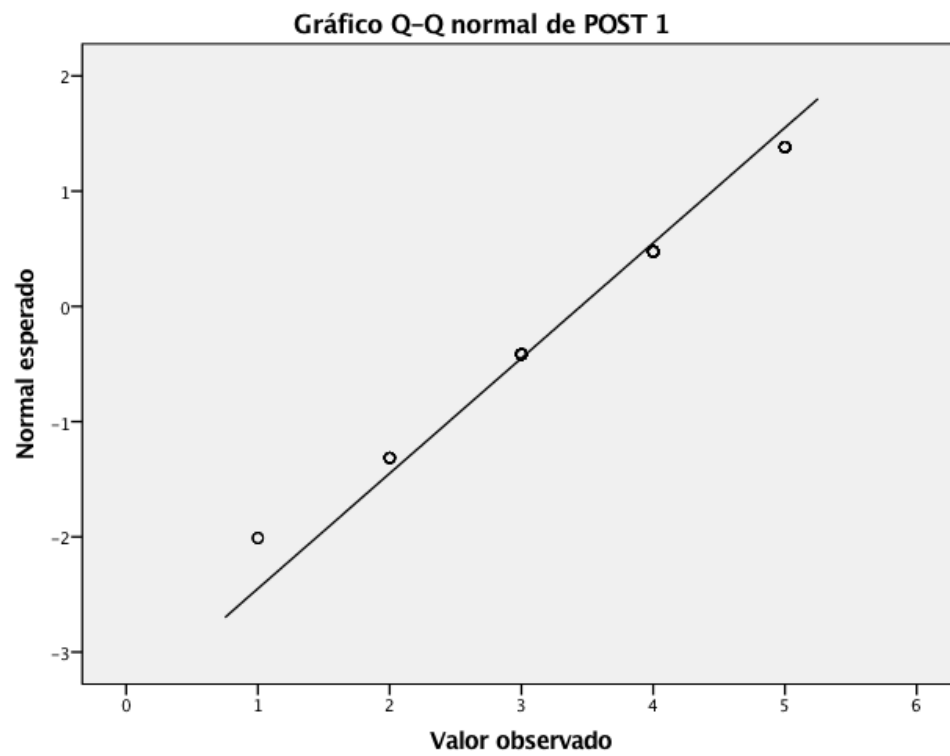
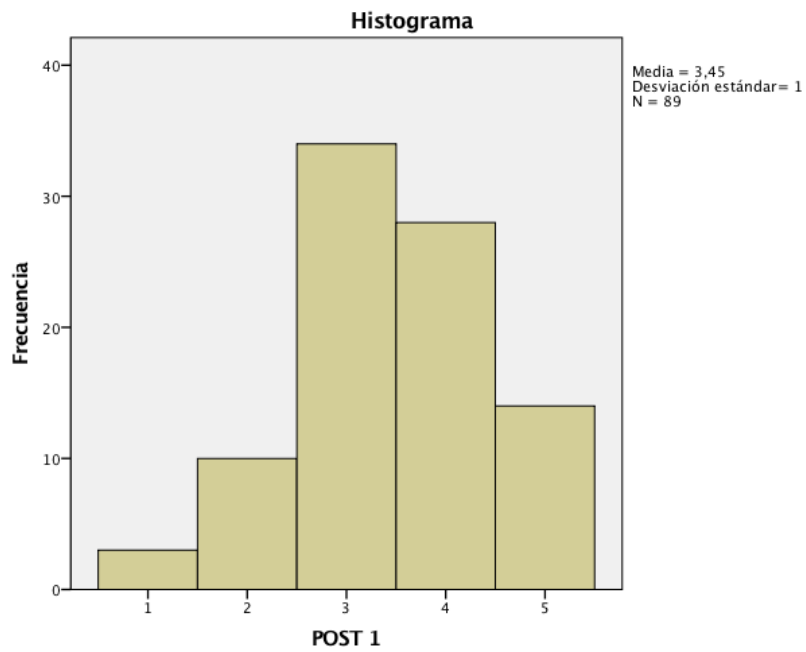
			Estadístico	Error estándar
POST 1	Media		3,45	,106
	95% de intervalo de confianza para la media	Límite inferior	3,24	
		Límite superior	3,66	
	Media recortada al 5%		3,48	
	Mediana		3,00	
	Varianza		1,000	
	Desviación estándar		1,000	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		-,241	,255
	Curtosis		-,223	,506

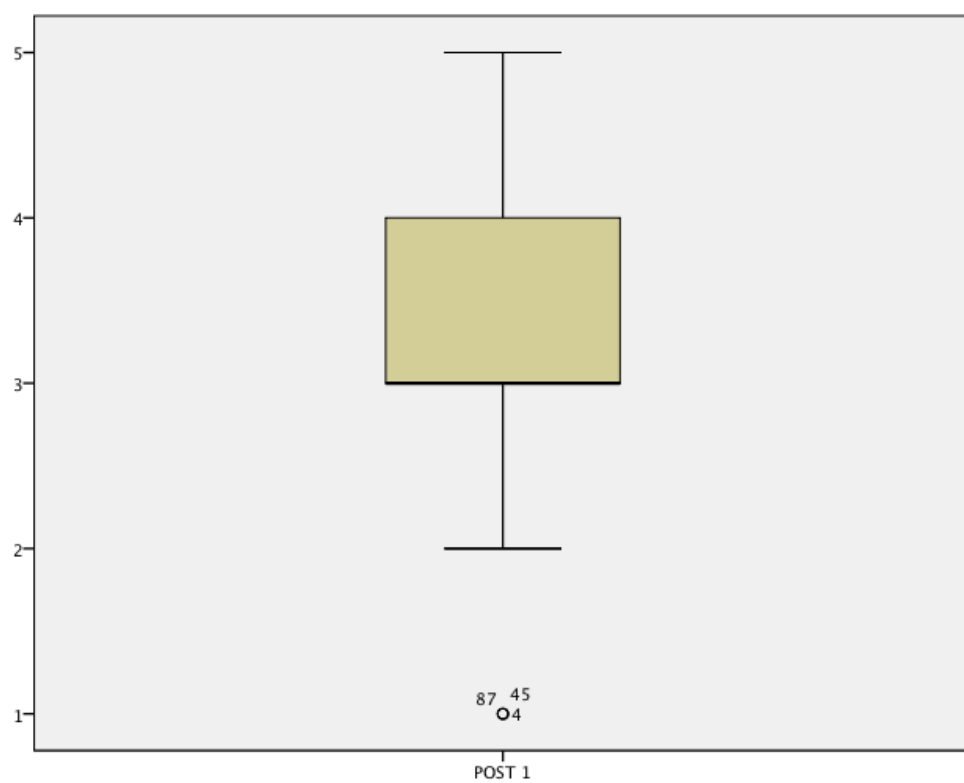
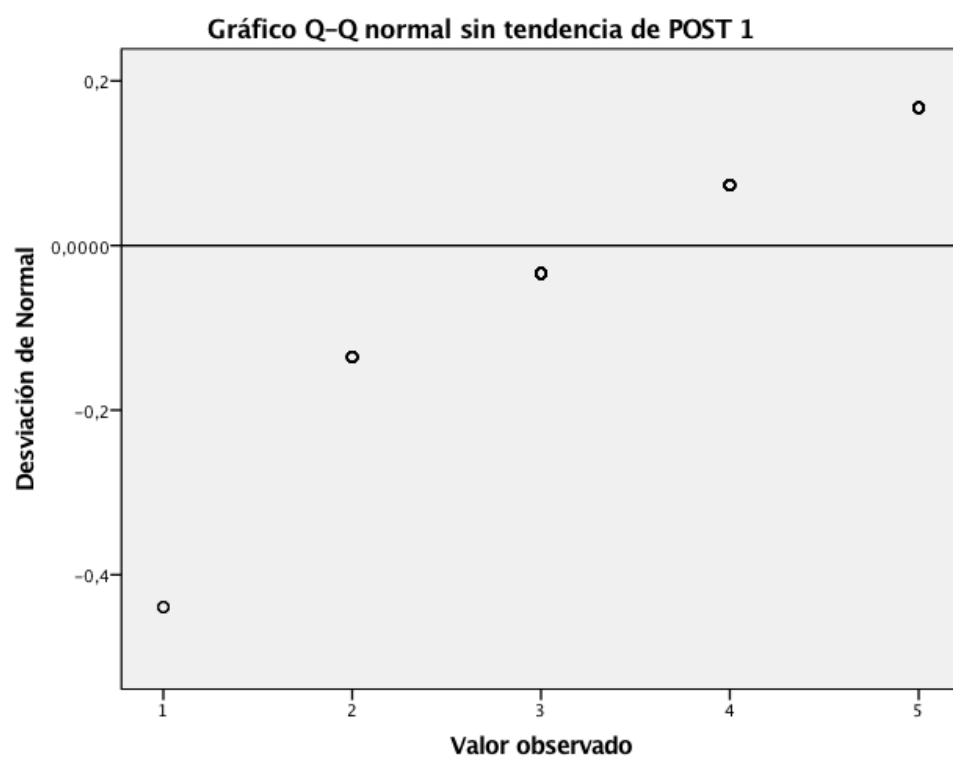
Pruebas de normalidad

Kolmogorov-Smirnov ^a				Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 1	,202	89	,000	,899	89	,000

a. Corrección de significación de Lilliefors

POST 1





NPART TESTS

/WILCOXON=PRE1 WITH POST1 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE1	100	1,83	,943	1	5
POST 1	89	3,45	1,000	1	5

Prueba de rangos con signo de Wilcoxon

Rangos

		N	Rango promedio	Suma de rangos
POST 1 - PRE1	Rangos negativos	2 ^a	13,50	27,00
	Rangos positivos	73 ^b	38,67	2823,00
	Empates	14 ^c		
	Total	89		

a. POST 1 < PRE1

b. POST 1 > PRE1

c. POST 1 = PRE1

Estadísticos de prueba^a

POST 1 -
PRE1

Z	-7,474 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE2
/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE2	98	98,0%	2	2,0%	100	100,0%

Descriptivos

			Estadístico	Error estándar
PRE2	Media		2,02	,102
	95% de intervalo de confianza para la media	Límite inferior	1,82	
		Límite superior	2,22	
	Media recortada al 5%		1,97	

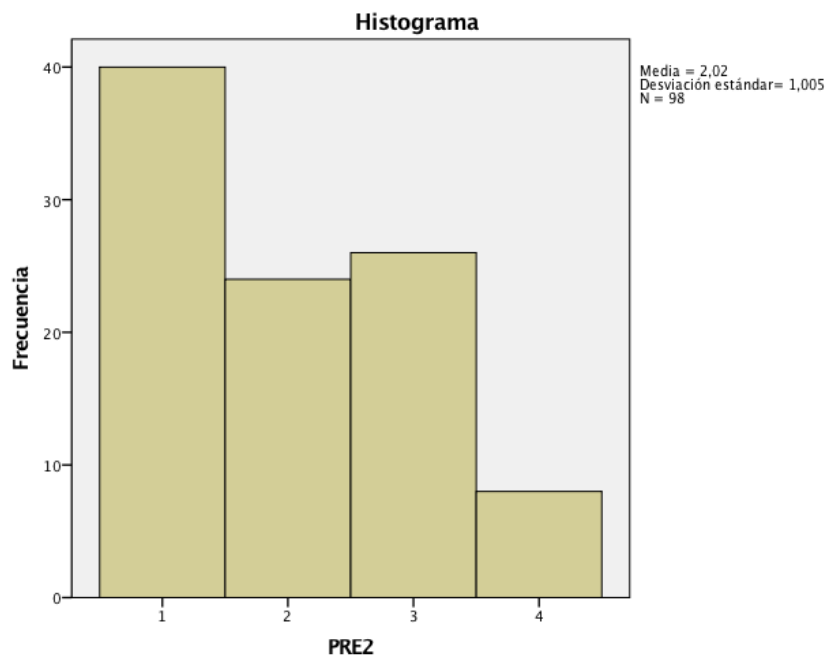
Mediana	2,00	
Varianza	1,010	
Desviación estándar	1,005	
Mínimo	1	
Máximo	4	
Rango	3	
Rango intercuartil	2	
Asimetría	,456	,244
Curtosis	-1,050	,483

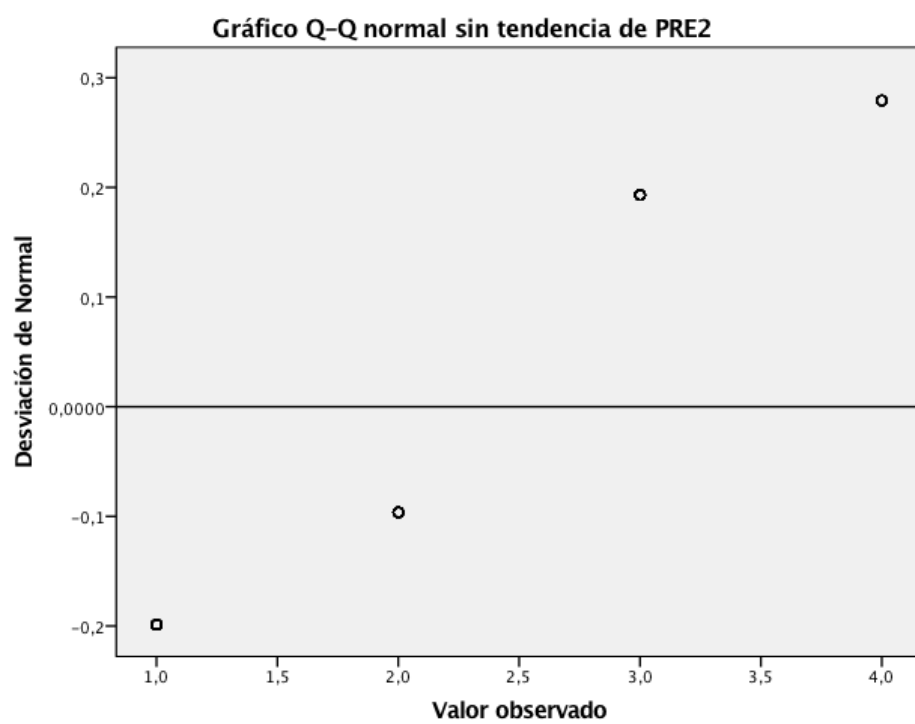
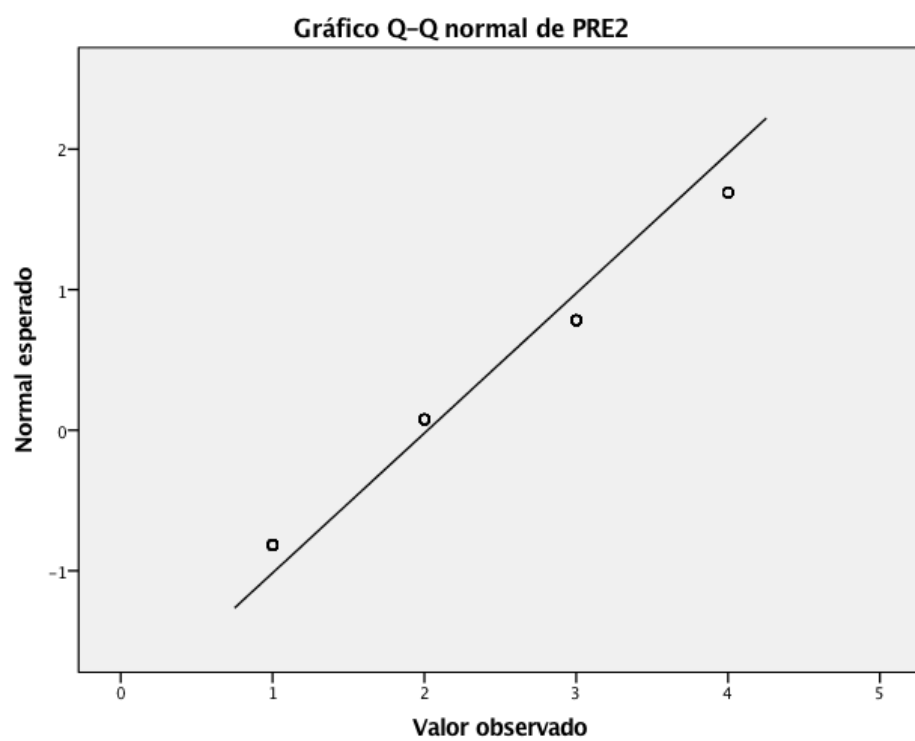
Pruebas de normalidad

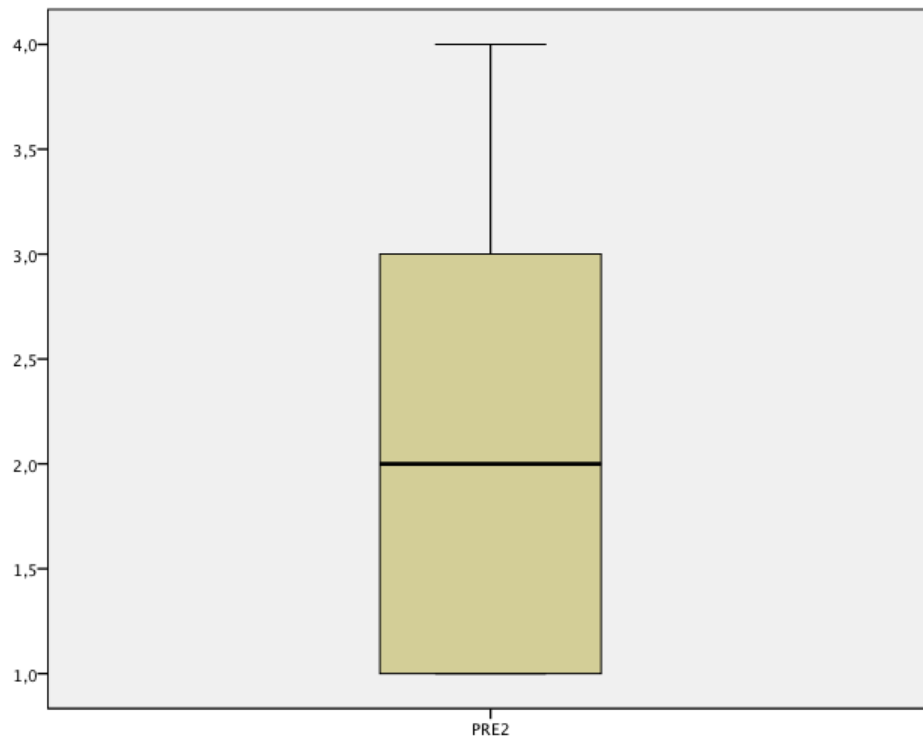
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic	gl	Sig.	Estadístic	gl	Sig.
	o			o		
PRE2	,253	98	,000	,826	98	,000

a. Corrección de significación de Lilliefors

PRE2







```
EXAMINE VARIABLES=POST2
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 2	87	87,0%	13	13,0%	100	100,0%

Descriptivos

			Estadístico	Error estándar
POST 2	Media		3,22	,099
	95% de intervalo de confianza para la media	Límite inferior	3,02	
		Límite superior	3,41	
	Media recortada al 5%		3,21	
	Mediana		3,00	
	Varianza		,847	
	Desviación estándar		,920	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		,097	,258
	Curtosis		-,147	,511

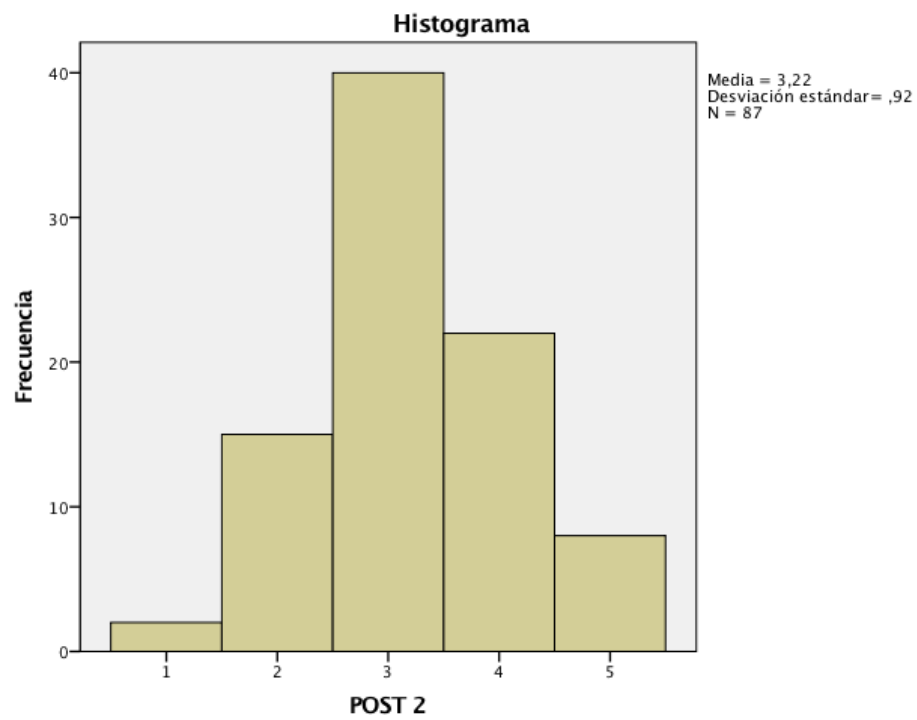
Pruebas de normalidad

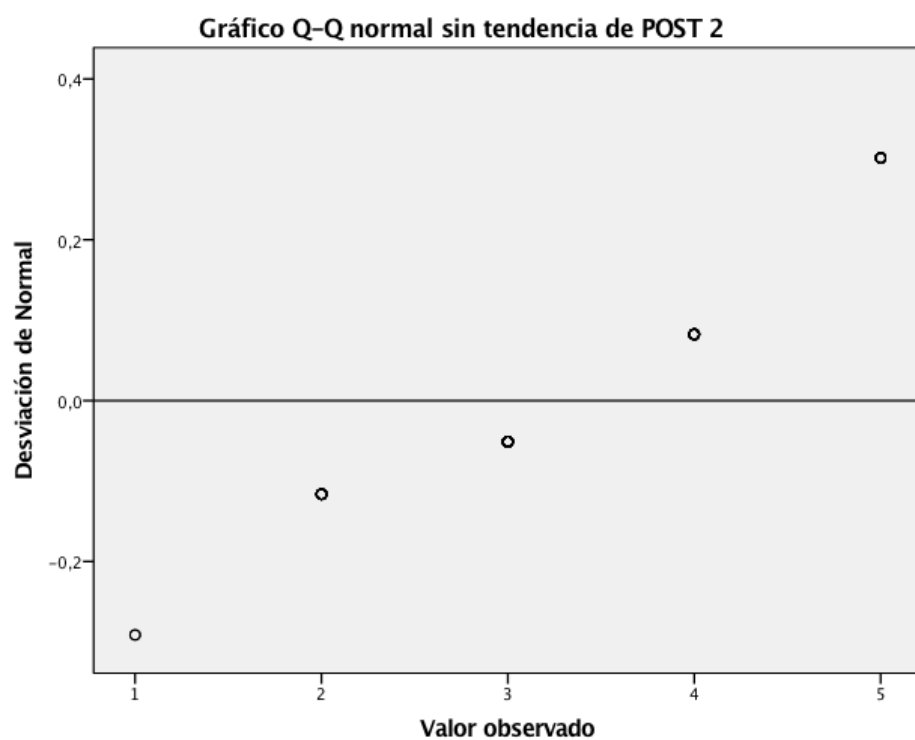
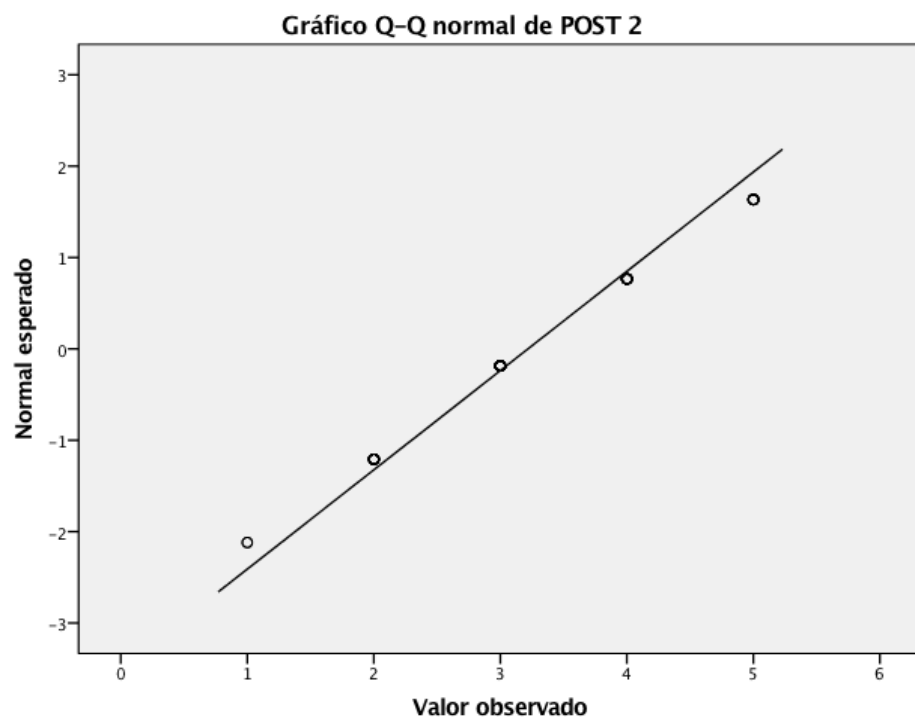
Kolmogorov-Smirnov ^a			Shapiro-Wilk		
Estadístico	gl	Sig.	Estadístico	gl	Sig.

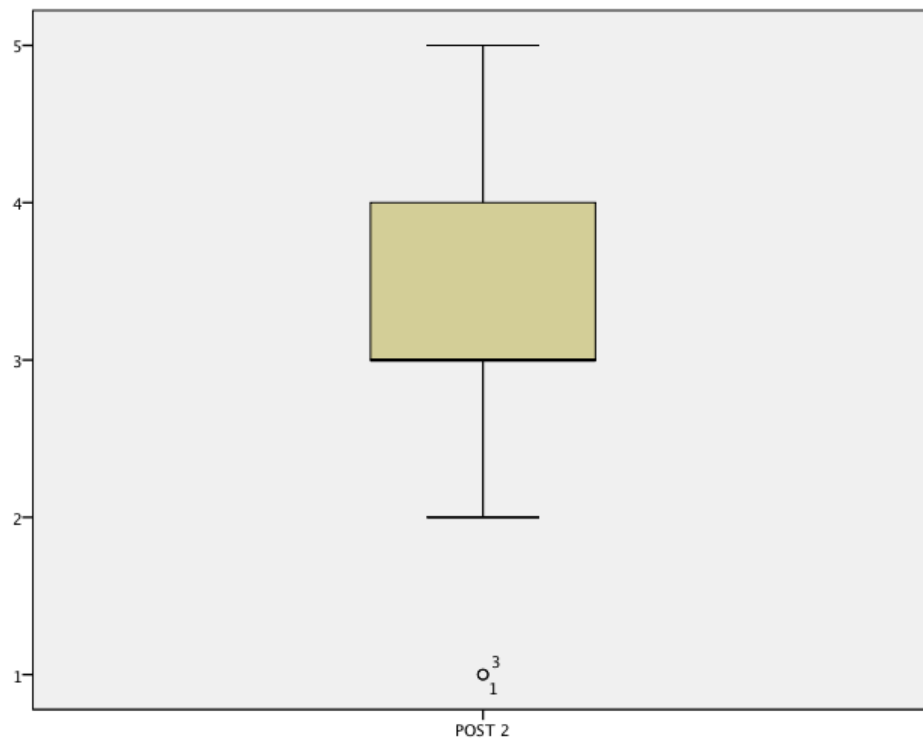
POST 2	,249	87	,000	,893	87	,000
-----------	------	----	------	------	----	------

a. Corrección de significación de Lilliefors

POST 2







```

NPAR TESTS
  /WILCOXON=PRE2 WITH POST2 (PAIRED)
  /STATISTICS DESCRIPTIVES
  /MISSING ANALYSIS.

```

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE2	98	2,02	1,005	1	4
POST 2	87	3,22	,920	1	5

Prueba de rangos con signo de Wilcoxon

		Rangos		
		N	Rango promedio	Suma de rangos
POST 2 - PRE2	Rangos negativos	5 ^a	11,50	57,50
	Rangos positivos	56 ^b	32,74	1833,50
	Empates	24 ^c		
	Total	85		

a. POST 2 < PRE2

b. POST 2 > PRE2

c. POST 2 = PRE2

Estadísticos de prueba^a

POST 2 - PRE2	
Z	-6,503 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE3
/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE3	97	97,0%	3	3,0%	100	100,0%

Descriptivos

			Estadístico	Error estándar
PRE3	Media		1,81	,098
	95% de intervalo de confianza para la media	Límite inferior	1,62	
		Límite superior	2,01	
	Media recortada al 5%		1,74	
	Mediana		1,00	
	Varianza		,924	
	Desviación estándar		,961	
	Mínimo		1	
	Máximo		4	
	Rango		3	
	Rango intercuartil		2	
	Asimetría		,815	,245
	Curtosis		-,548	,485

Pruebas de normalidad

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístico	gl	Sig.	Estadístico	gl	Sig.
PRE3	,307	97	,000	,779	97	,000

a. Corrección de significación de Lilliefors

PRE3

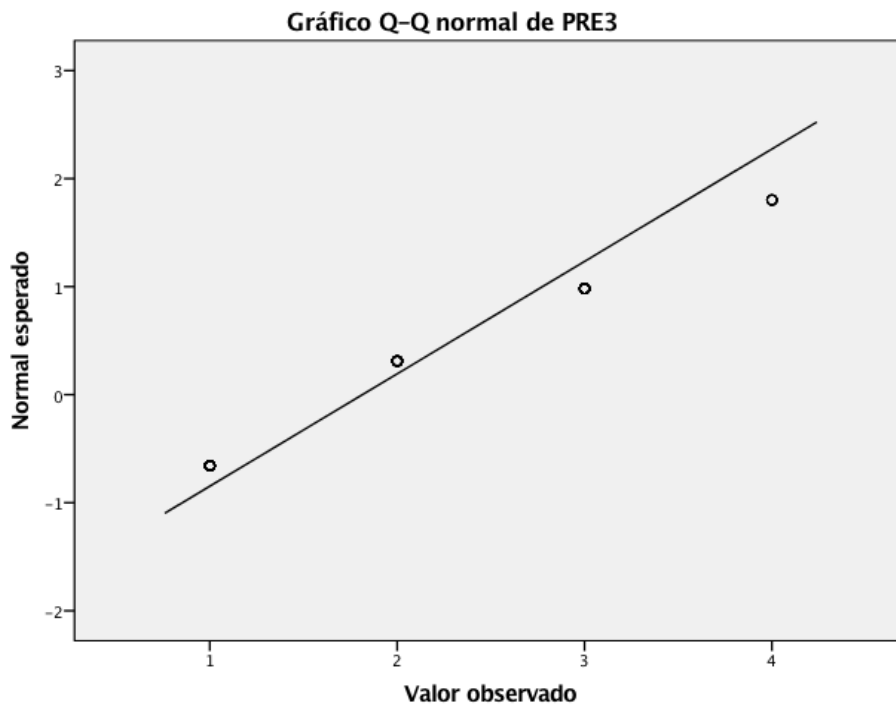
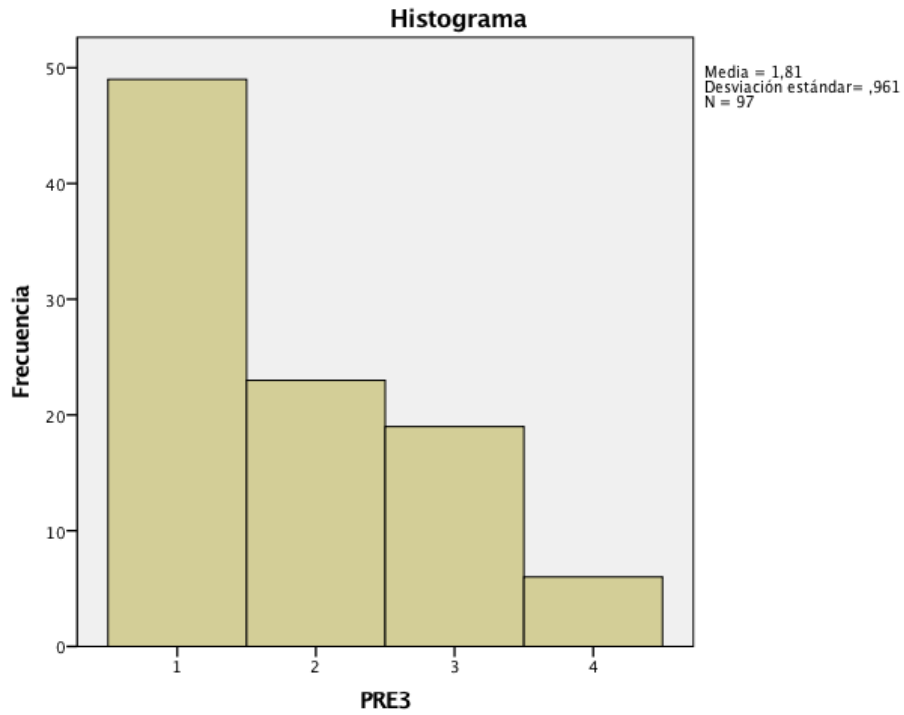
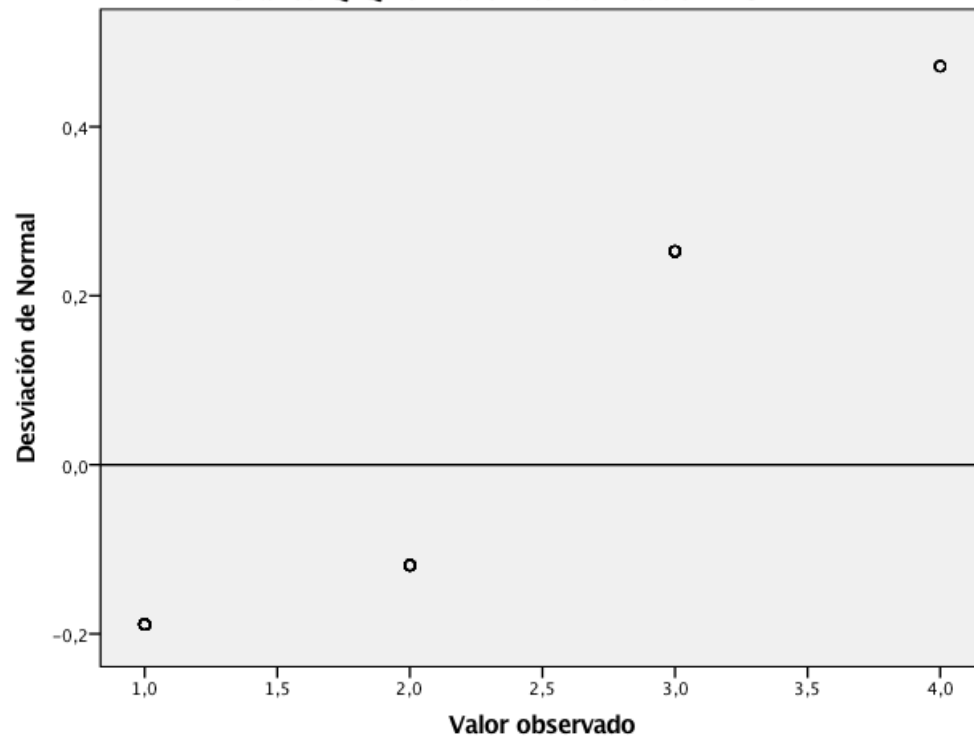
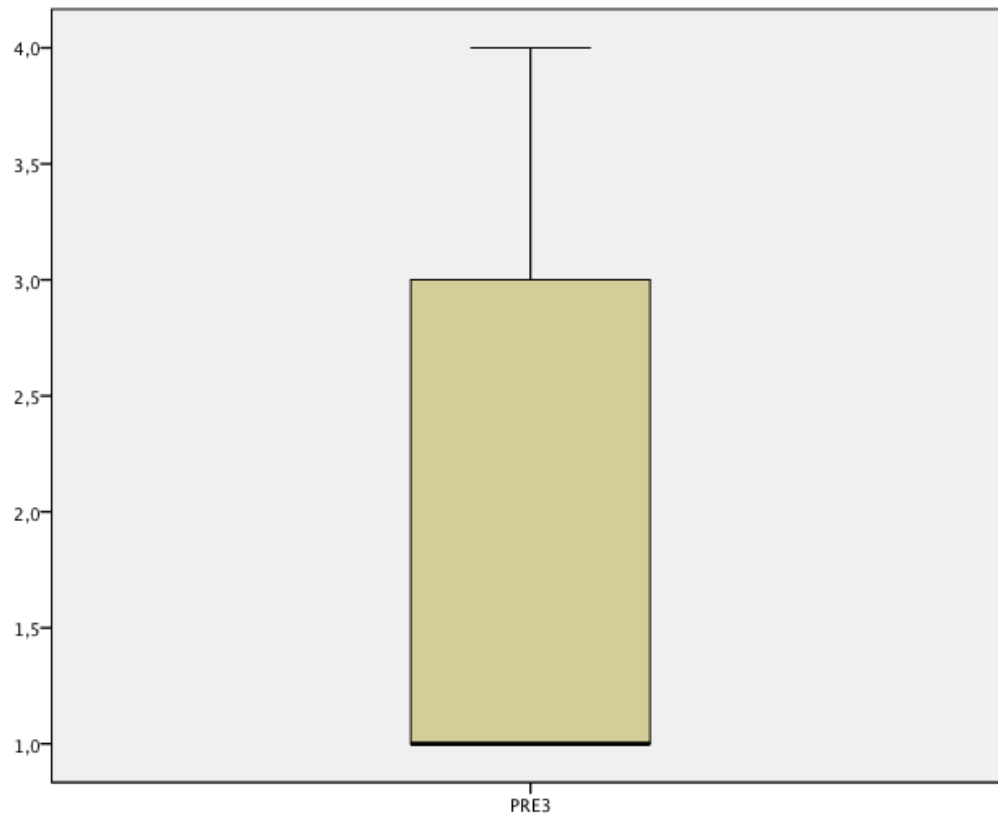


Gráfico Q-Q normal sin tendencia de PRE3





```
EXAMINE VARIABLES=POST3  
  /PLOT BOXPLOT HISTOGRAM NPLOT  
  /COMPARE GROUPS  
  /STATISTICS DESCRIPTIVES  
  /CINTERVAL 95  
  /MISSING LISTWISE  
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 3	90	90,0%	10	10,0%	100	100,0%

Descriptivos

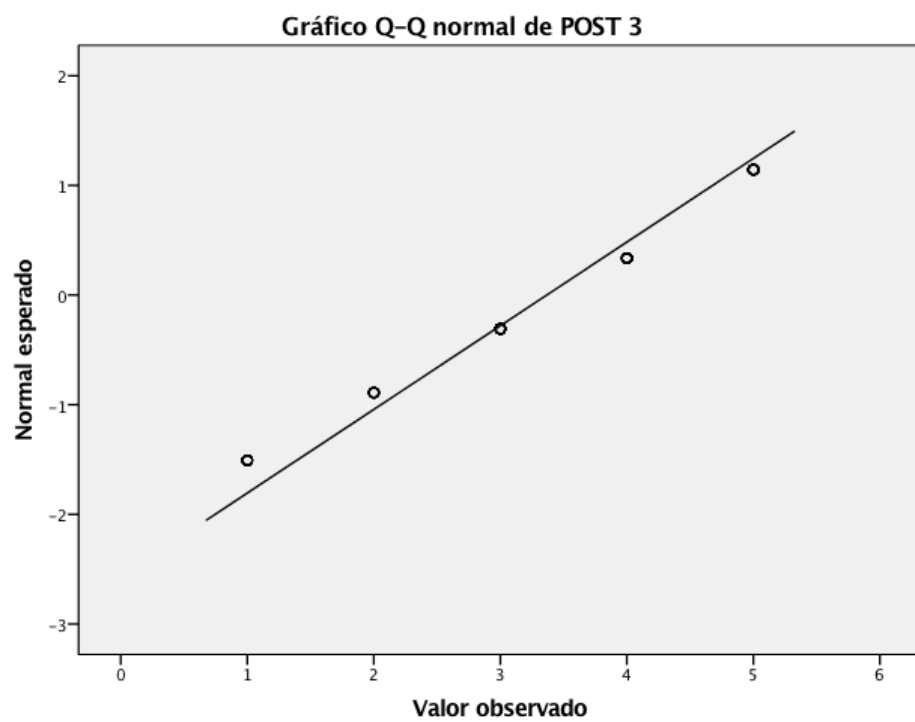
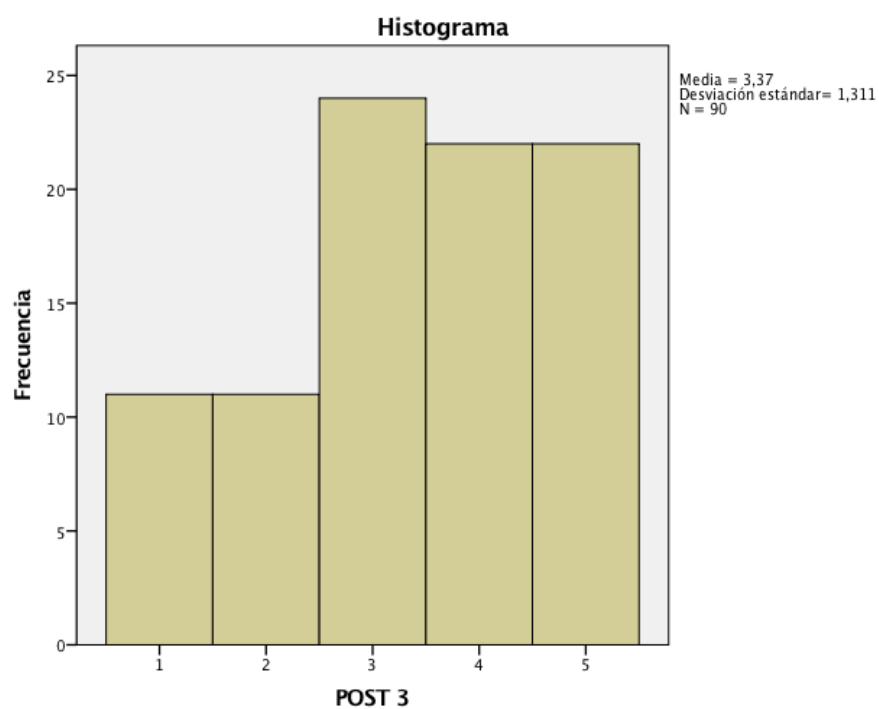
			Estadístico	Error estándar
POST 3	Media		3,37	,138
	95% de intervalo de confianza para la media	Límite inferior	3,09	
		Límite superior	3,64	
	Media recortada al 5%		3,41	
	Mediana		3,00	
	Varianza		1,718	
	Desviación estándar		1,311	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		-,376	,254
	Curtosis		-,888	,503

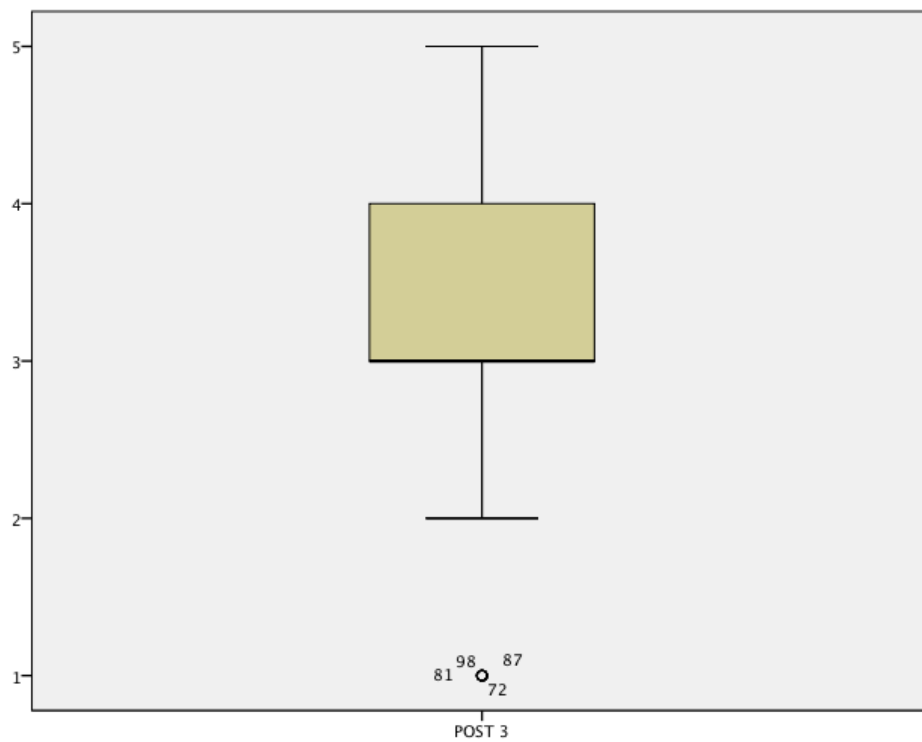
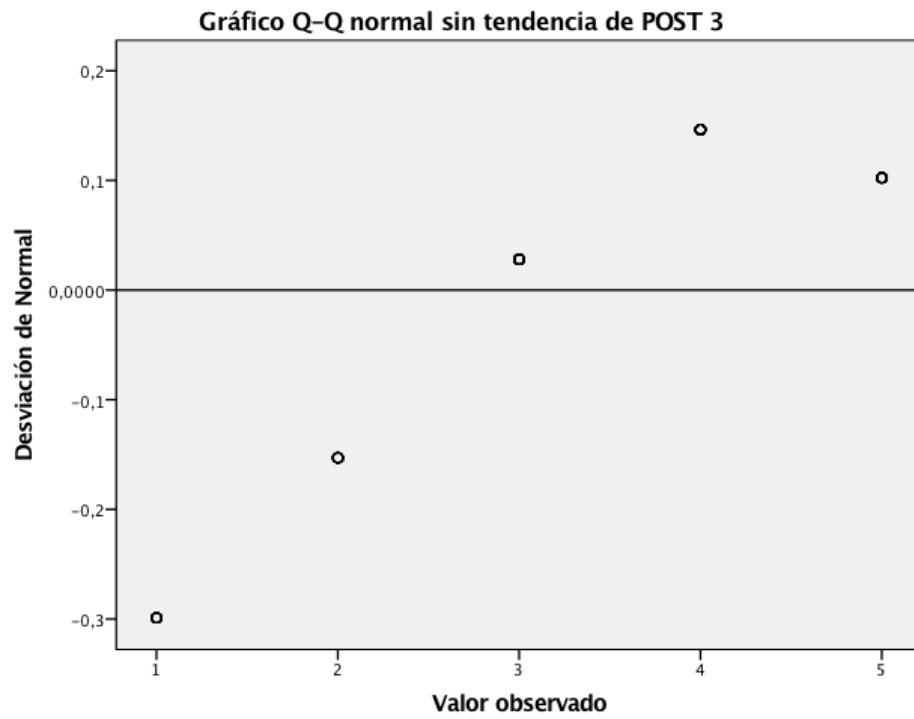
Pruebas de normalidad

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístico	gl	Sig.	Estadístico	gl	Sig.
POST 3	,174	90	,000	,889	90	,000

a. Corrección de significación de Lilliefors

POST 3





NPAR TESTS

```

/WILCOXON=PRE3 WITH POST3 (PAIRED)
/STATISTICS DESCRIPTIVES
/MISSING ANALYSIS.

```

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE3	97	1,81	,961	1	4
POST 3	90	3,37	1,311	1	5

Prueba de rangos con signo de Wilcoxon

Rangos

		N	Rango promedio	Suma de rangos
POST 3 - PRE3	Rangos negativos	8 ^a	29,88	239,00
	Rangos positivos	71 ^b	41,14	2921,00
	Empates	10 ^c		
	Total	89		

a. POST 3 < PRE3

b. POST 3 > PRE3

c. POST 3 = PRE3

Estadísticos de prueba^a

POST 3 -
PRE3

Z	-6,629 ^b
Sig. asintótica (bilateral)	,000

- a. Prueba de rangos con signo de Wilcoxon
- b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE4
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE4	100	100,0%	0	0,0%	100	100,0%

Descriptivos

			Estadístico	Error estándar
PRE4	Media		2,89	,125
	95% de intervalo de confianza para la media	Límite inferior	2,64	
		Límite superior	3,14	
	Media recortada al 5%		2,88	
	Mediana		3,00	
	Varianza		1,553	
	Desviación estándar		1,246	
	Mínimo		1	

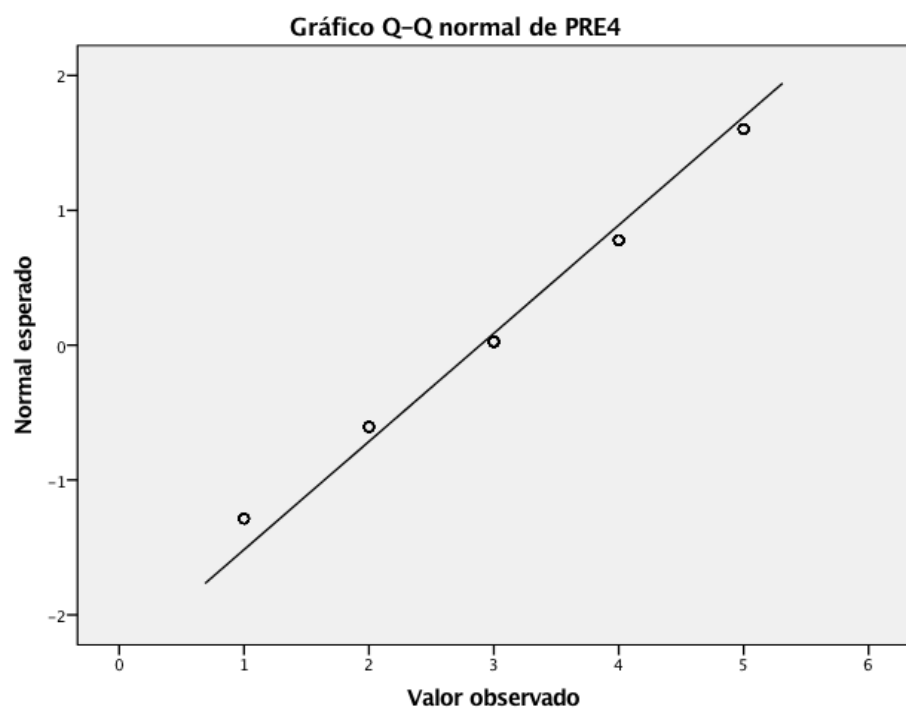
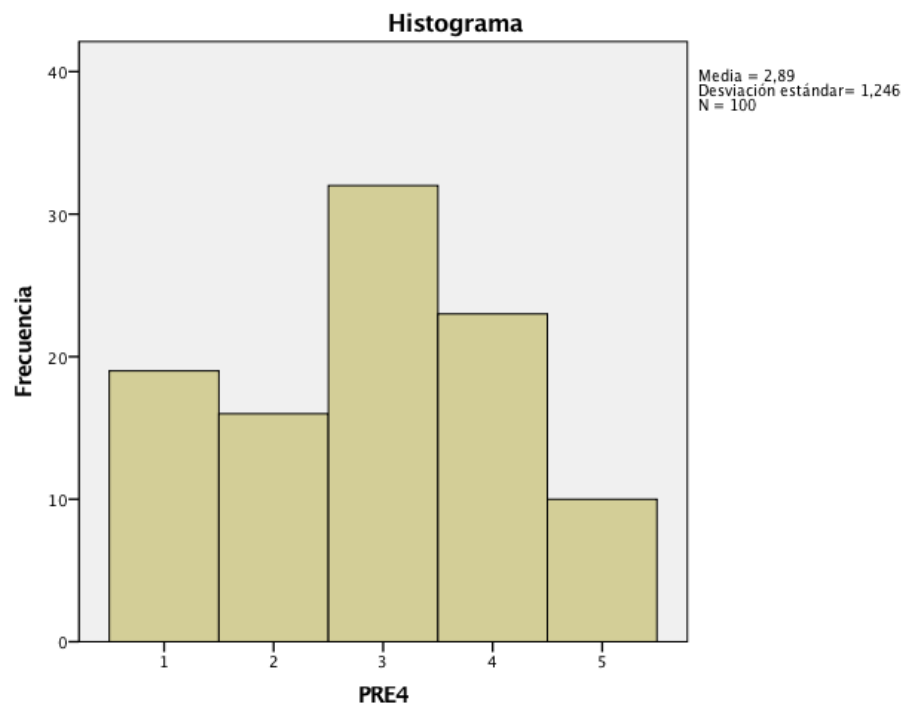
Máximo	5	
Rango	4	
Rango intercuartil	2	
Asimetría	-,075	,241
Curtosis	-,933	,478

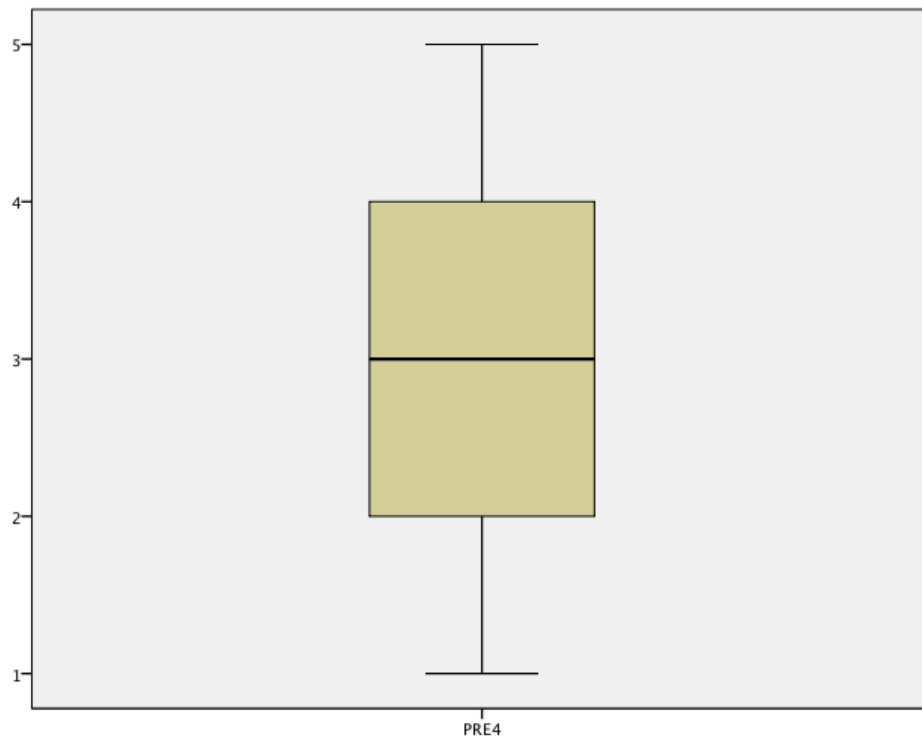
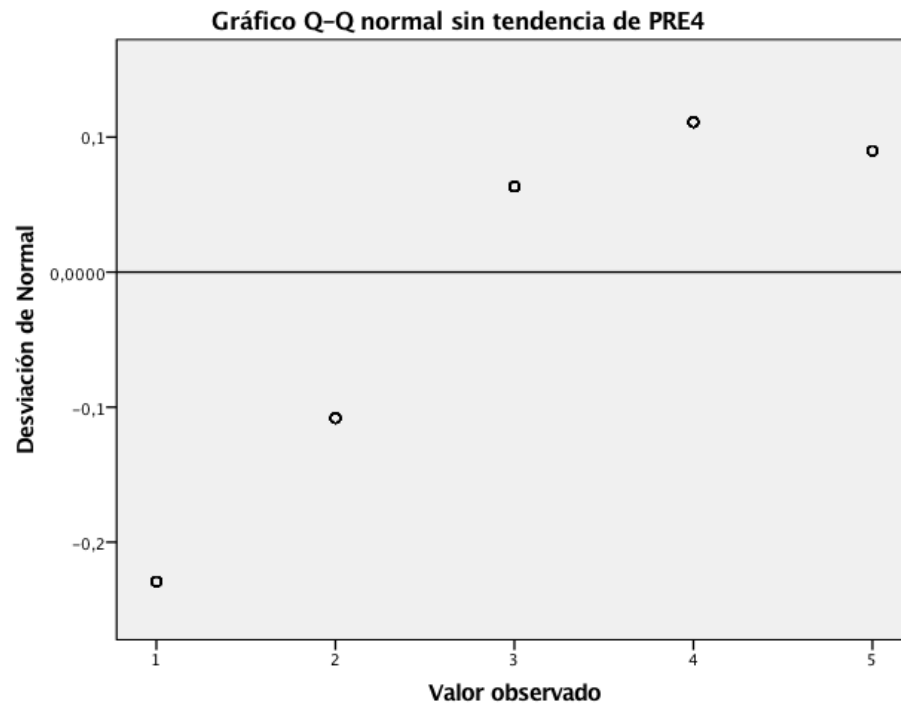
Pruebas de normalidad

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic	gl	Sig.	Estadístic	gl	Sig.
	o			o		
PRE4	,185	100	,000	,904	100	,000

a. Corrección de significación de Lilliefors

PRE4





EXAMINE VARIABLES=POST4

```

/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 4	96	96,0%	4	4,0%	100	100,0%

Descriptivos

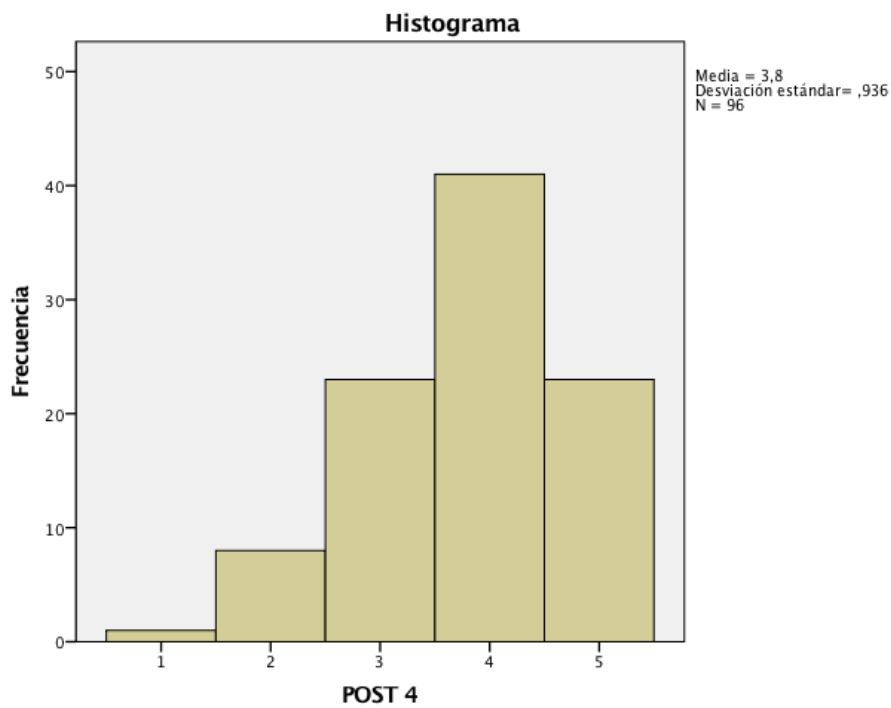
			Estadístico	Error estándar
POST 4	Media		3,80	,096
	95% de intervalo de confianza para la media	Límite inferior	3,61	
		Límite superior	3,99	
	Media recortada al 5%		3,85	
	Mediana		4,00	
	Varianza		,876	
	Desviación estándar		,936	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		-,535	,246
	Curtosis		-,133	,488

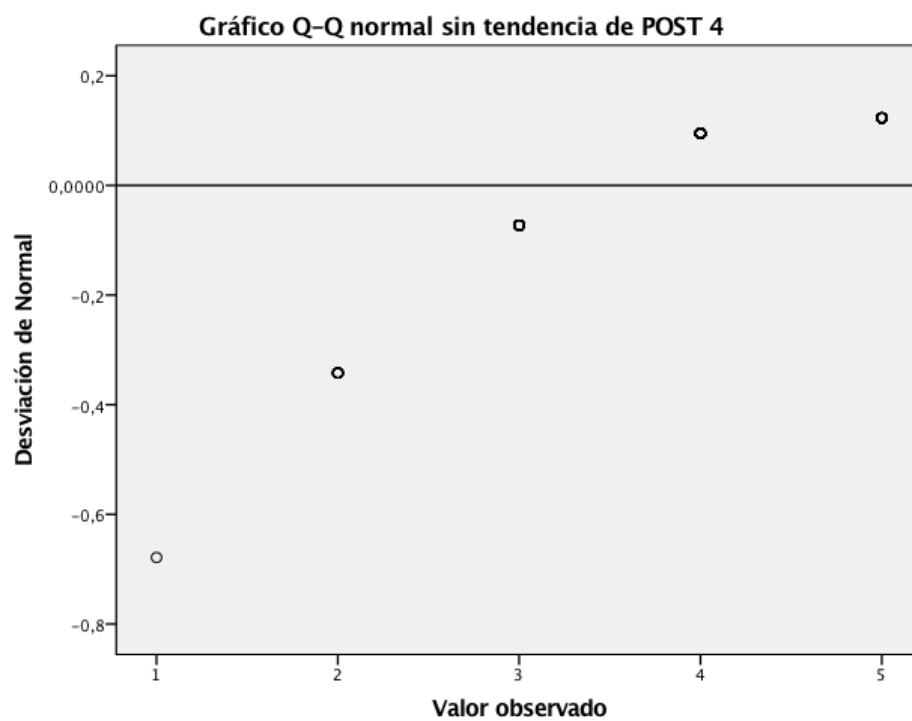
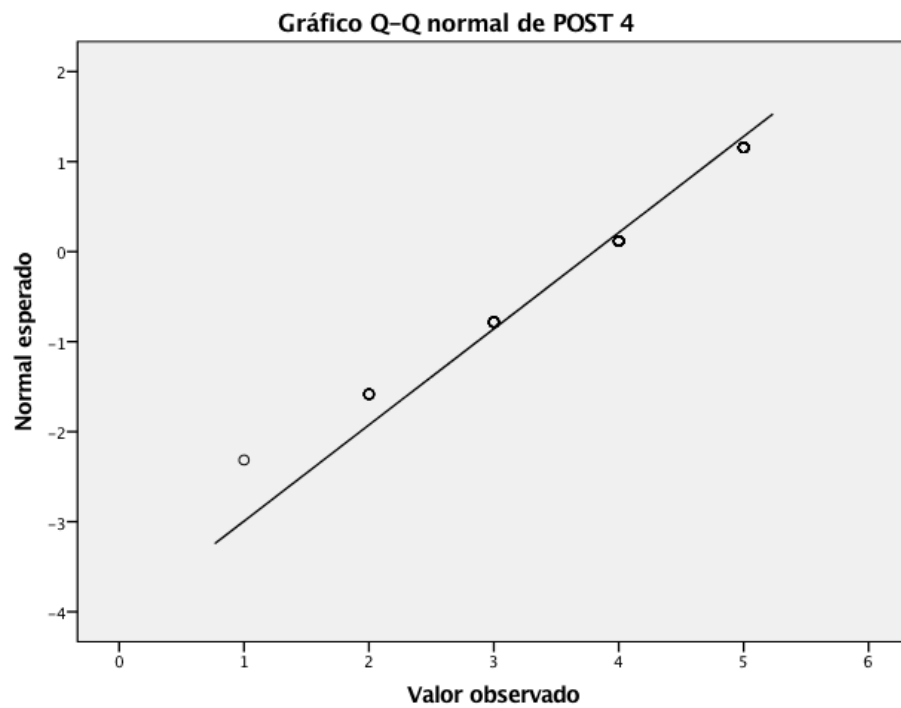
Pruebas de normalidad

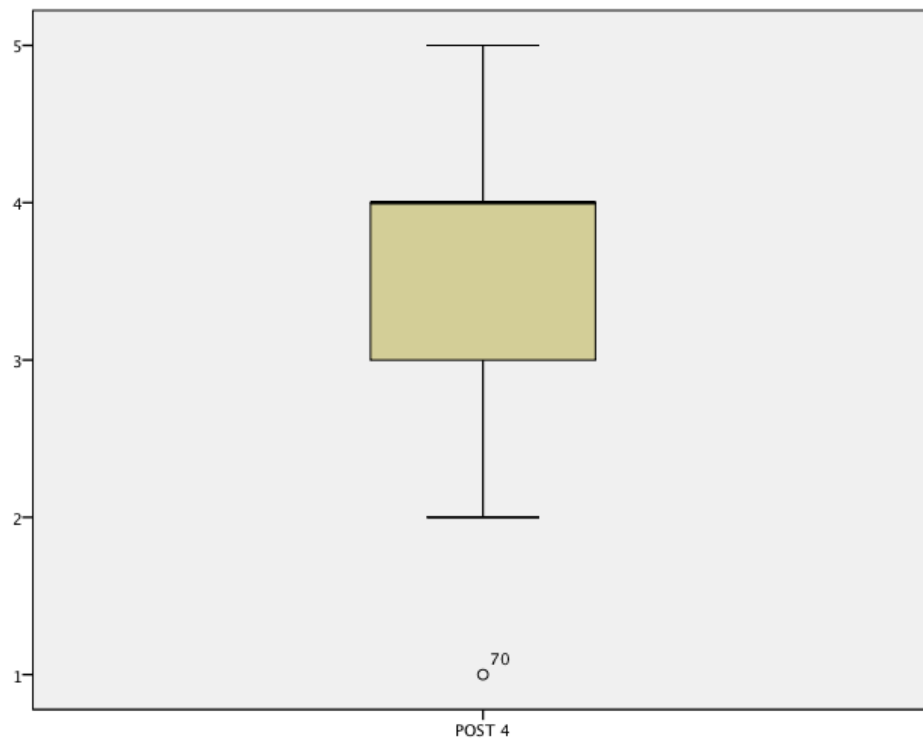
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 4	,250	96	,000	,872	96	,000

a. Corrección de significación de Lilliefors

POST 4







```

NPAR TESTS
  /WILCOXON=PRE4 WITH POST4 (PAIRED)
  /STATISTICS DESCRIPTIVES
  /MISSING ANALYSIS.

```

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE4	100	2,89	1,246	1	5
POST 4	96	3,80	,936	1	5

Prueba de rangos con signo de Wilcoxon

		Rangos		
		N	Rango promedio	Suma de rangos
POST 4 - PRE4	Rangos negativos	13 ^a	31,77	413,00
	Rangos positivos	59 ^b	37,54	2215,00
	Empates	24 ^c		
	Total	96		

a. POST 4 < PRE4

b. POST 4 > PRE4

c. POST 4 = PRE4

Estadísticos de prueba^a

POST 4 - PRE4	
Z	-5,141 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE5
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE5	100	100,0%	0	0,0%	100	100,0%

Descriptivos

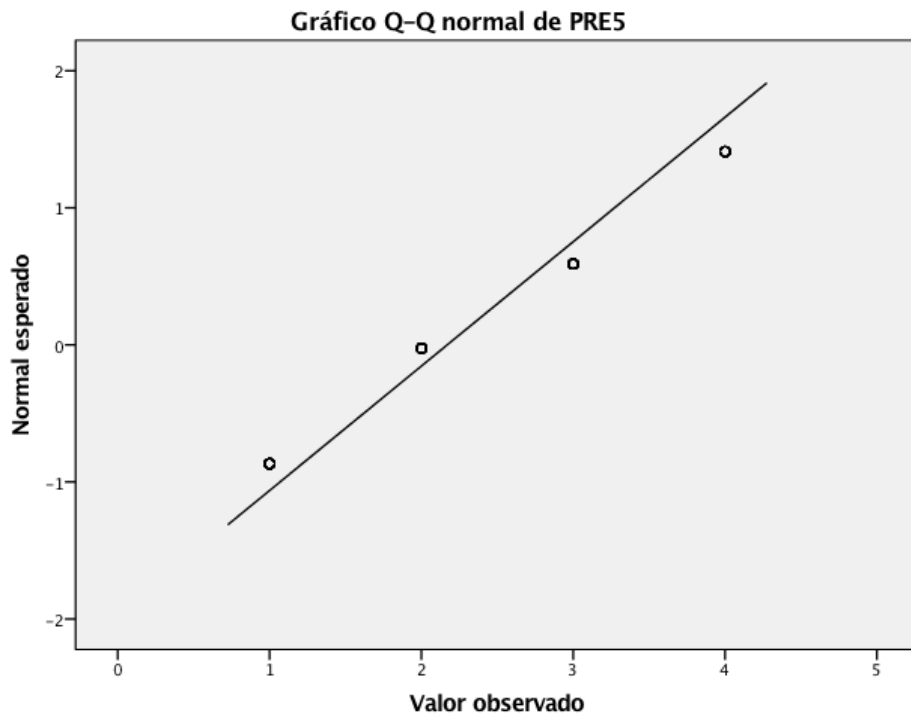
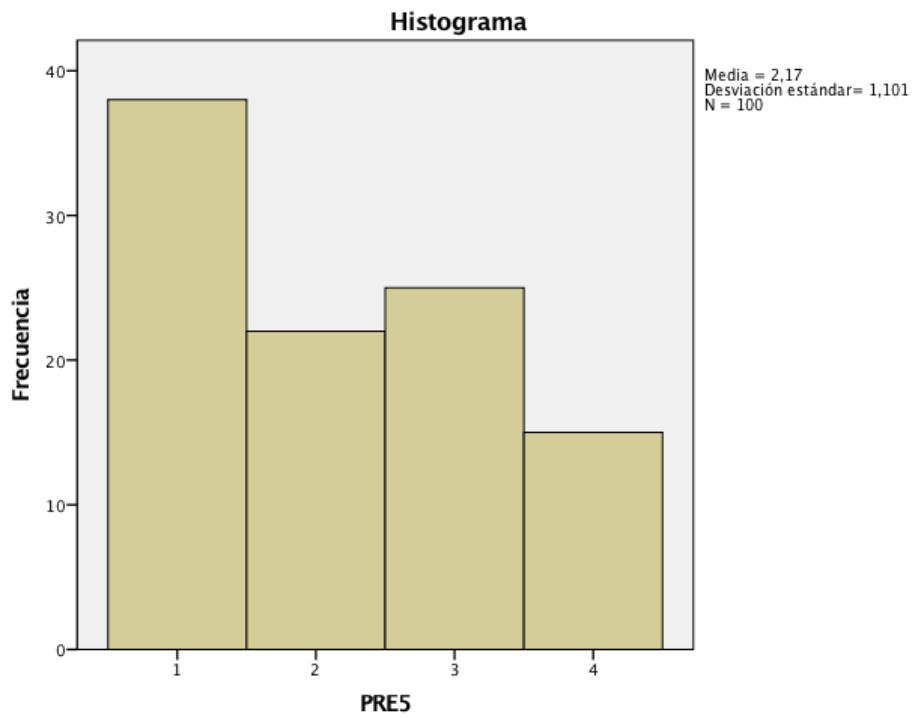
			Estadístico	Error estándar
PRE5	Media		2,17	,110
	95% de intervalo de confianza para la media	Límite inferior	1,95	
		Límite superior	2,39	
	Media recortada al 5%		2,13	
	Mediana		2,00	
	Varianza		1,213	
	Desviación estándar		1,101	
	Mínimo		1	
	Máximo		4	
	Rango		3	
	Rango intercuartil		2	
	Asimetría		,349	,241
	Curtosis		-1,261	,478

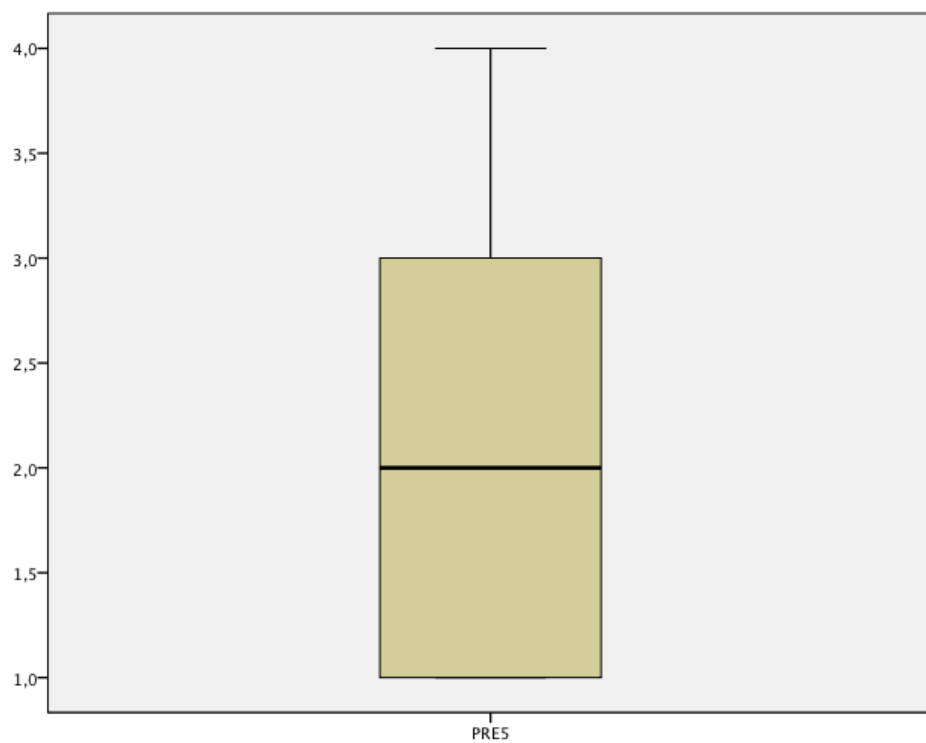
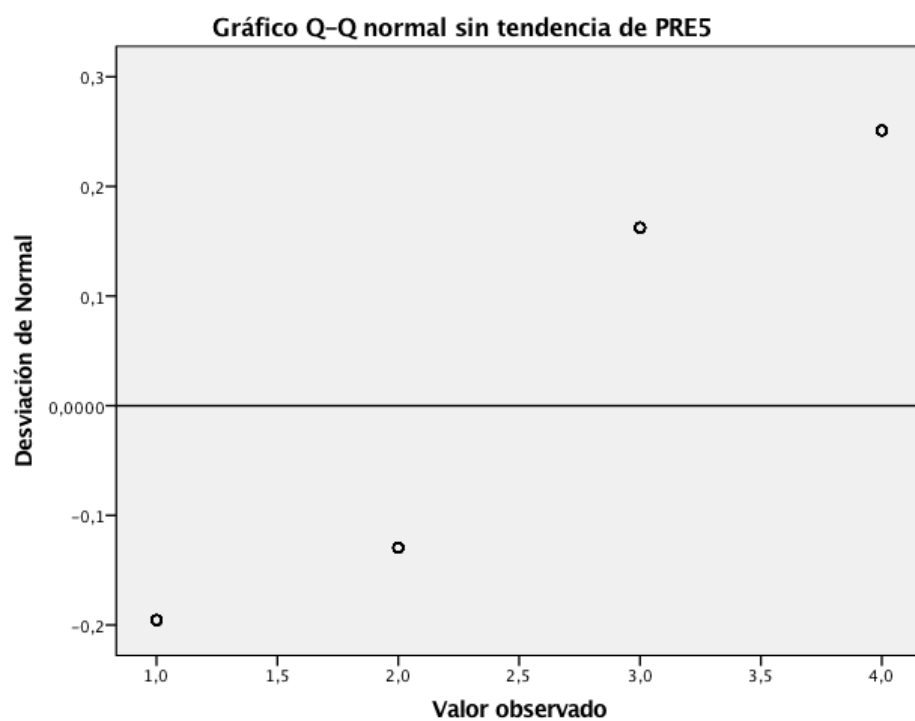
Pruebas de normalidad

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístico	gl	Sig.	Estadístico	gl	Sig.
PRE5	,236	100	,000	,833	100	,000

a. Corrección de significación de Lilliefors

PRE5





```

EXAMINE VARIABLES=POST5
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 5	98	98,0%	2	2,0%	100	100,0%

Descriptivos

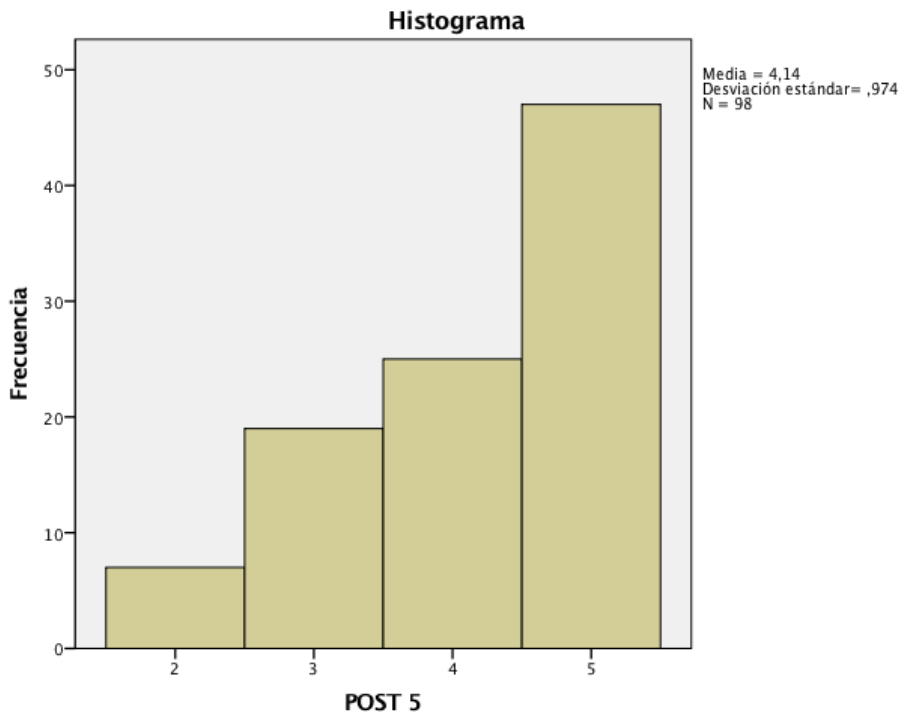
			Estadístico	Error estándar
POST 5	Media		4,14	,098
	95% de intervalo de confianza para la media	Límite inferior	3,95	
		Límite superior	4,34	
	Media recortada al 5%		4,21	
	Mediana		4,00	
	Varianza		,948	
	Desviación estándar		,974	
	Mínimo		2	
	Máximo		5	
	Rango		3	
	Rango intercuartil		2	
	Asimetría		-,772	,244
	Curtosis		-,591	,483

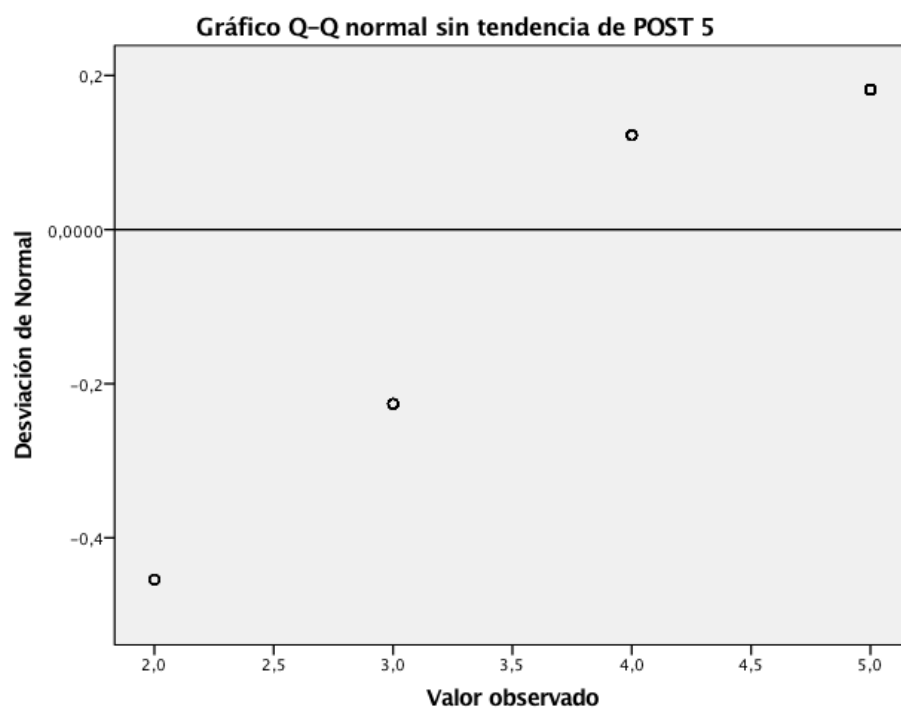
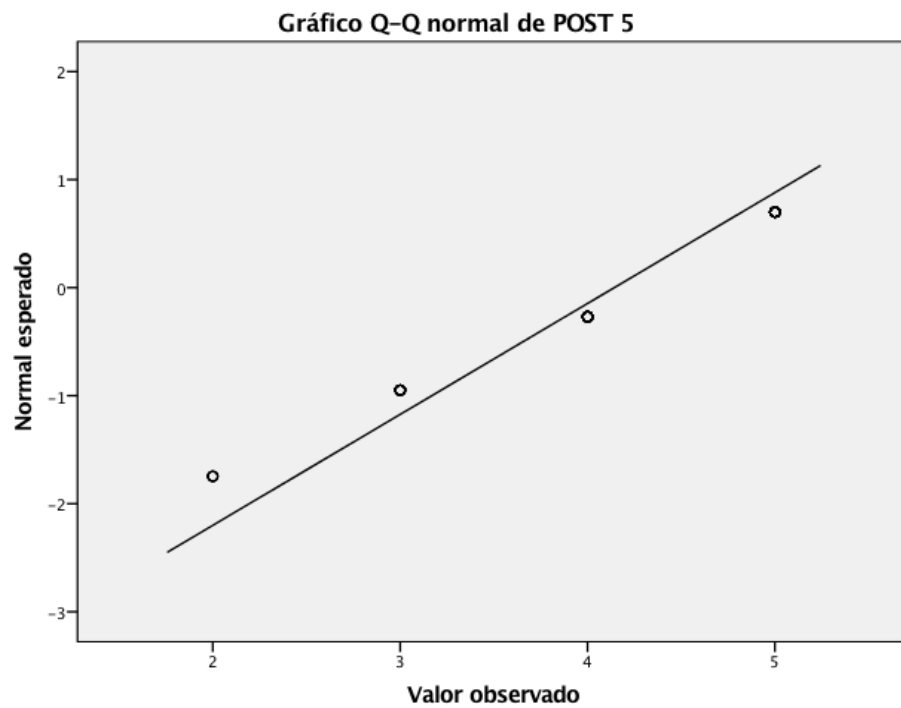
Pruebas de normalidad

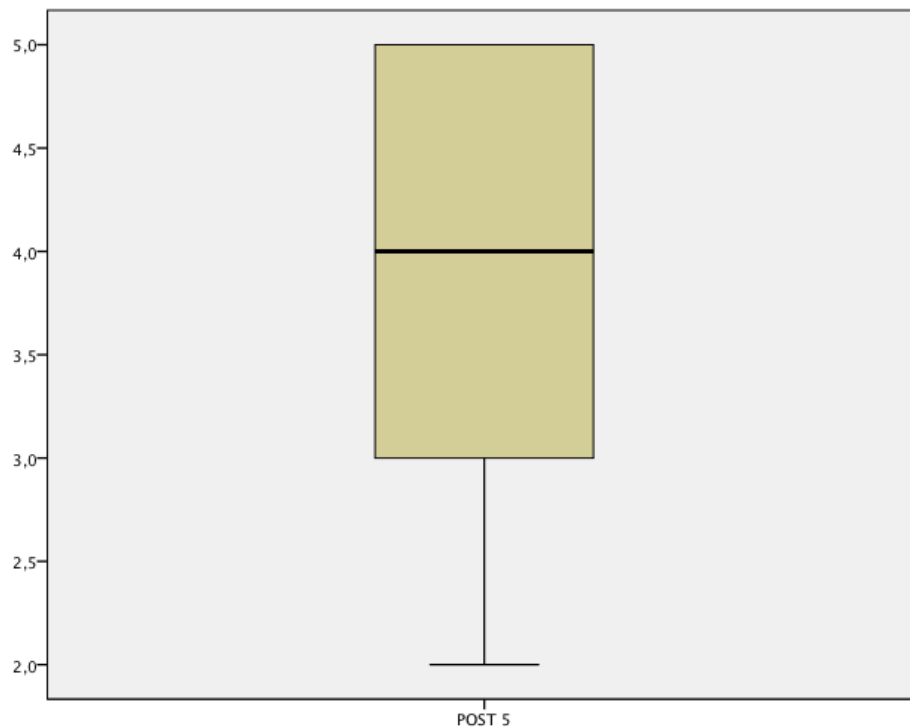
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 5	,290	98	,000	,792	98	,000

a. Corrección de significación de Lilliefors

POST 5







```

NPAR TESTS
  /WILCOXON=PRE5 WITH POST5 (PAIRED)
  /STATISTICS DESCRIPTIVES
  /MISSING ANALYSIS.

```

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE5	100	2,17	1,101	1	4
POST 5	98	4,14	,974	2	5

Prueba de rangos con signo de Wilcoxon

Rangos

		N	Rango promedio	Suma de rangos
POST 5 - PRE5	Rangos negativos	3 ^a	14,00	42,00
	Rangos positivos	82 ^b	44,06	3613,00
	Empates	13 ^c		
	Total	98		

a. POST 5 < PRE5

b. POST 5 > PRE5

c. POST 5 = PRE5

Estadísticos de prueba^a

POST 5 -
PRE5

Z	-7,891 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE6
/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE6	100	100,0%	0	0,0%	100	100,0%

Descriptivos

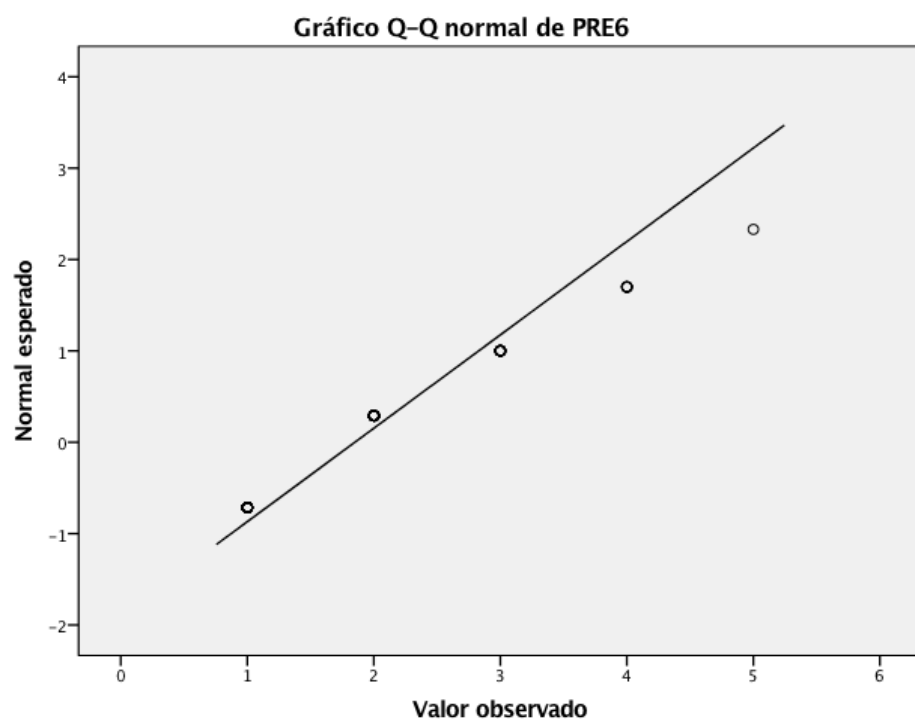
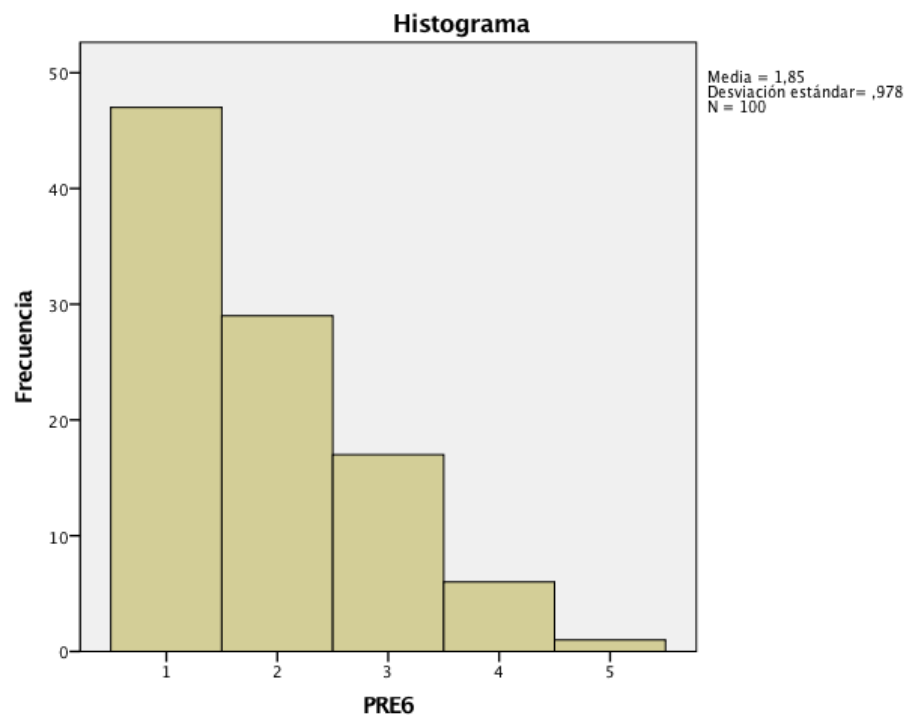
			Estadístico	Error estándar
PRE6	Media		1,85	,098
	95% de intervalo de confianza para la media	Límite inferior	1,66	
		Límite superior	2,04	
	Media recortada al 5%		1,77	
	Mediana		2,00	
	Varianza		,957	
	Desviación estándar		,978	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		,968	,241
	Curtosis		,199	,478

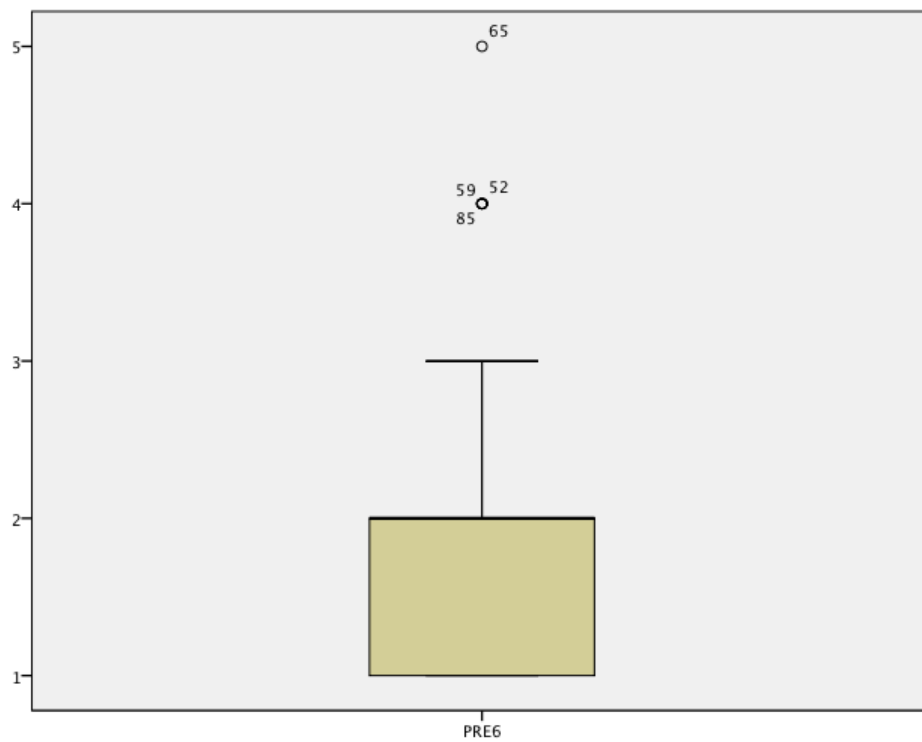
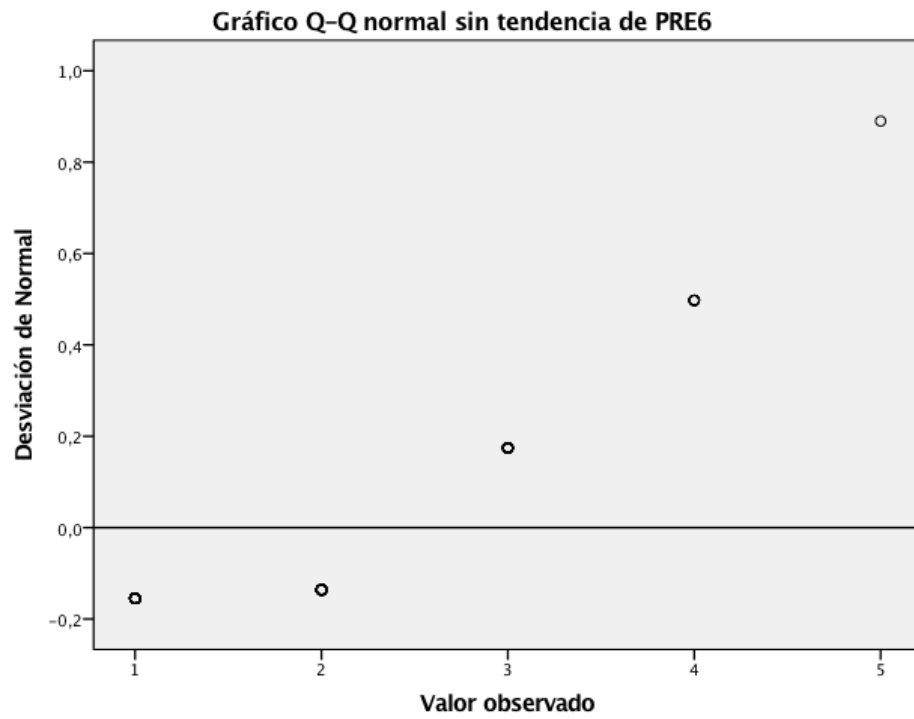
Pruebas de normalidad

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístico	gl	Sig.	Estadístico	gl	Sig.
PRE6	,278	100	,000	,799	100	,000

a. Corrección de significación de Lilliefors

PRE6





EXAMINE VARIABLES=POST6

```

/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 6	97	97,0%	3	3,0%	100	100,0%

Descriptivos

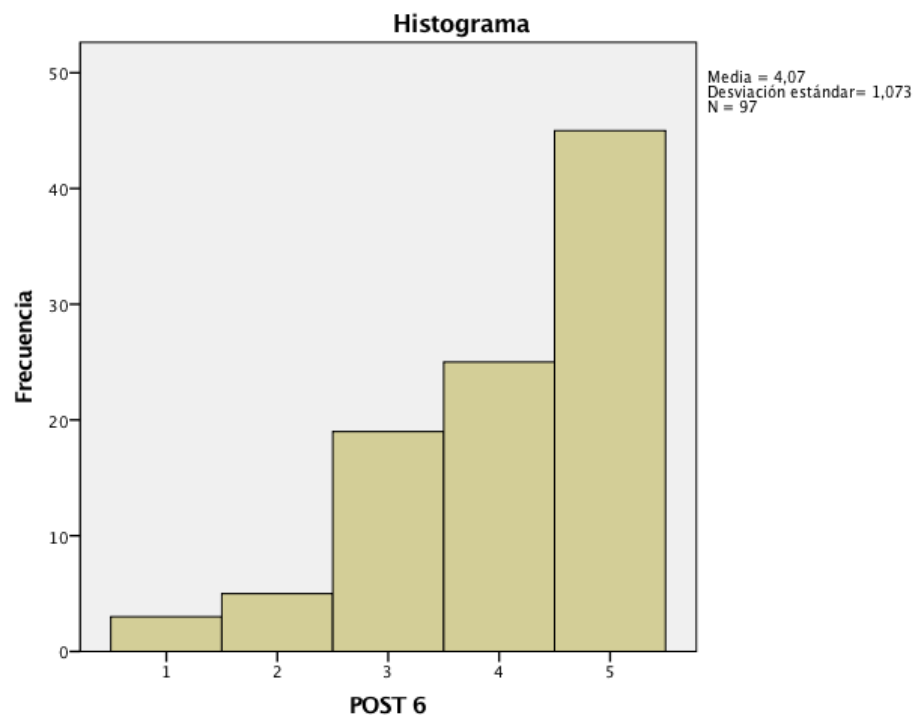
			Estadístico	Error estándar
POST 6	Media		4,07	,109
	95% de intervalo de confianza para la media	Límite inferior	3,86	
		Límite superior	4,29	
	Media recortada al 5%		4,17	
	Mediana		4,00	
	Varianza		1,151	
	Desviación estándar		1,073	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		-1,025	,245
	Curtosis		,402	,485

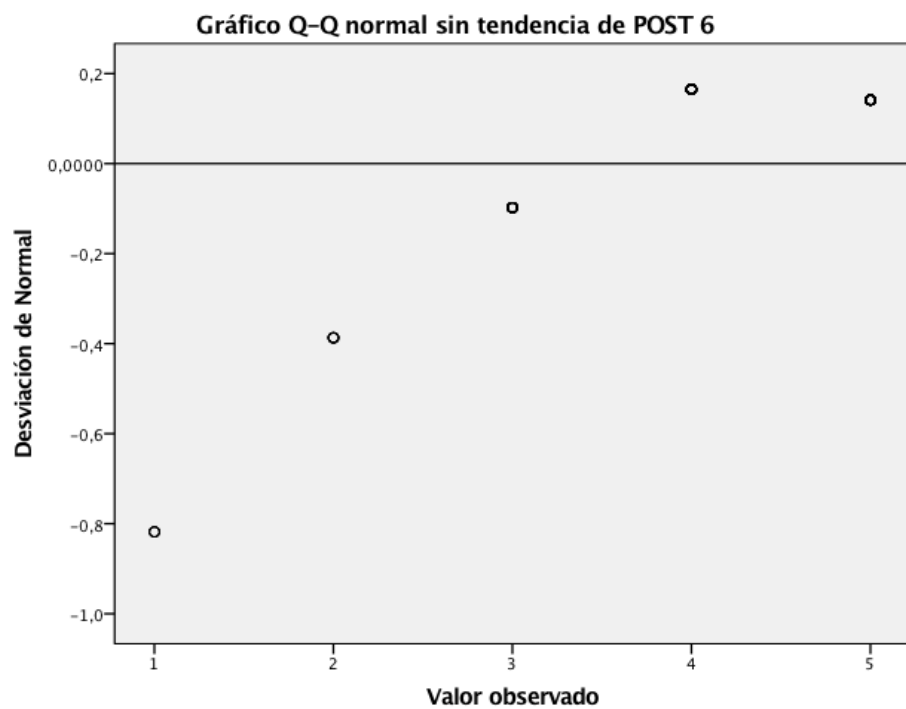
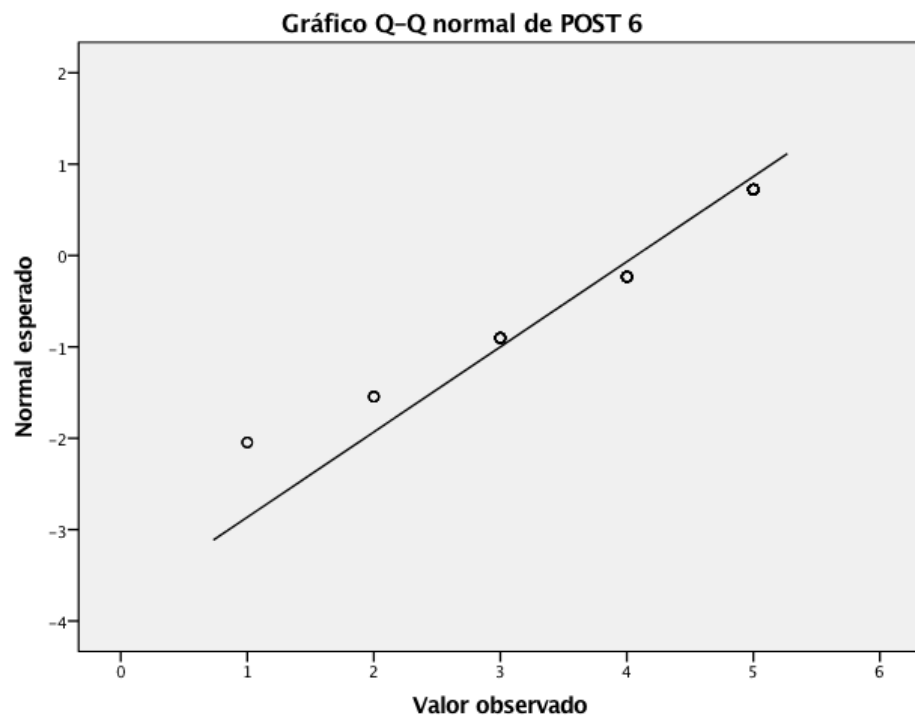
Pruebas de normalidad

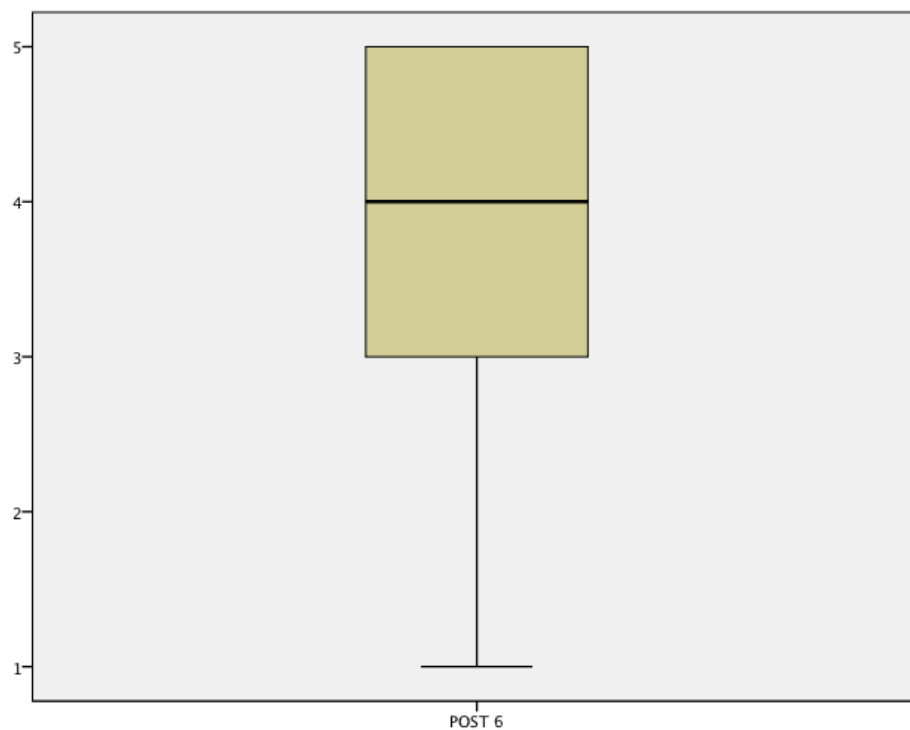
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic	o	gl	Estadístic	o	gl
POST 6	,270		97	,801		97
			Sig.			Sig.
			,000			,000

a. Corrección de significación de Lilliefors

POST 6







```

NPAR TESTS
  /WILCOXON=PRE6 WITH POST6 (PAIRED)
  /STATISTICS DESCRIPTIVES
  /MISSING ANALYSIS.

```

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE6	100	1,85	,978	1	5
POST 6	97	4,07	1,073	1	5

Prueba de rangos con signo de Wilcoxon

Rangos

		N	Rango promedio	Suma de rangos
POST 6 - PRE6	Rangos negativos	3 ^a	7,50	22,50
	Rangos positivos	82 ^b	44,30	3632,50
	Empates	12 ^c		
	Total	97		

a. POST 6 < PRE6

b. POST 6 > PRE6

c. POST 6 = PRE6

Estadísticos de prueba^a

POST 6 -
PRE6

Z	-7,980 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE7
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

Casos

	Válido		Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE7	100	100,0%	0	0,0%	100	100,0%

Descriptivos

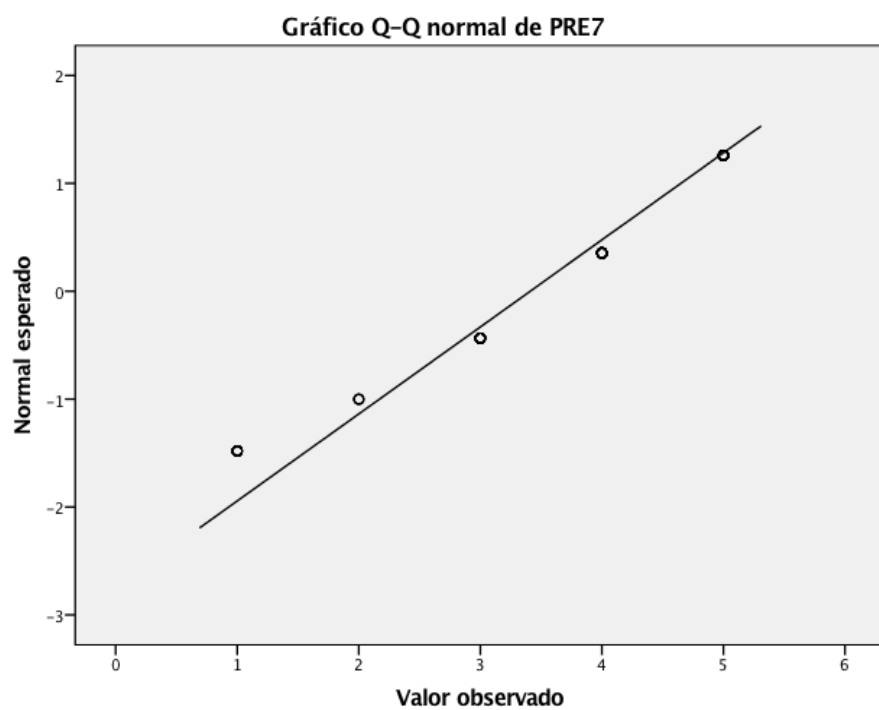
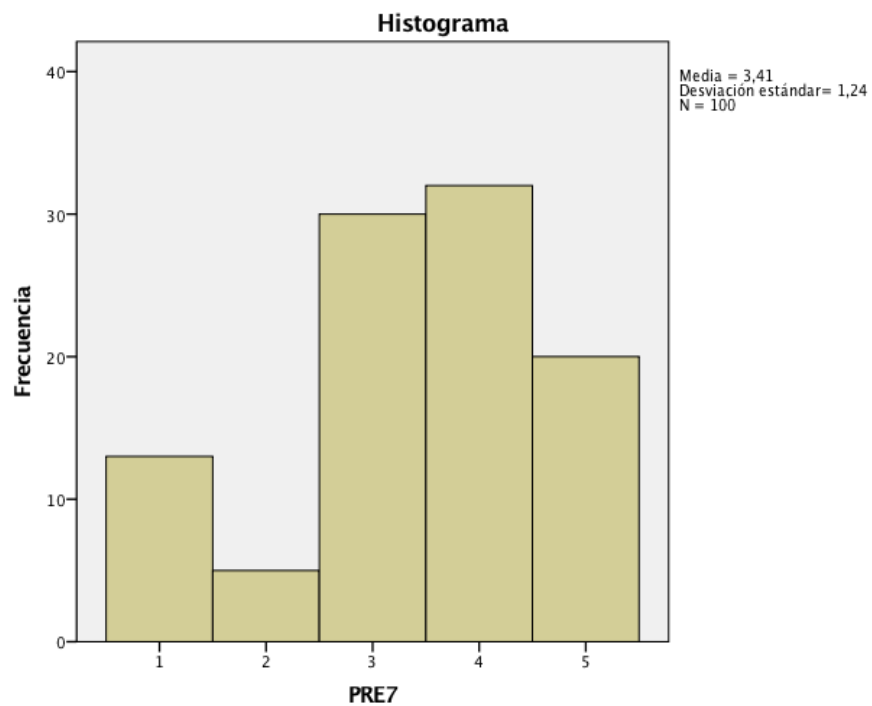
			Estadístico	Error estándar
PRE7	Media		3,41	,124
	95% de intervalo de confianza para la media	Límite inferior	3,16	
		Límite superior	3,66	
	Media recortada al 5%		3,46	
	Mediana		4,00	
	Varianza		1,537	
	Desviación estándar		1,240	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		-,601	,241
	Curtosis		-,410	,478

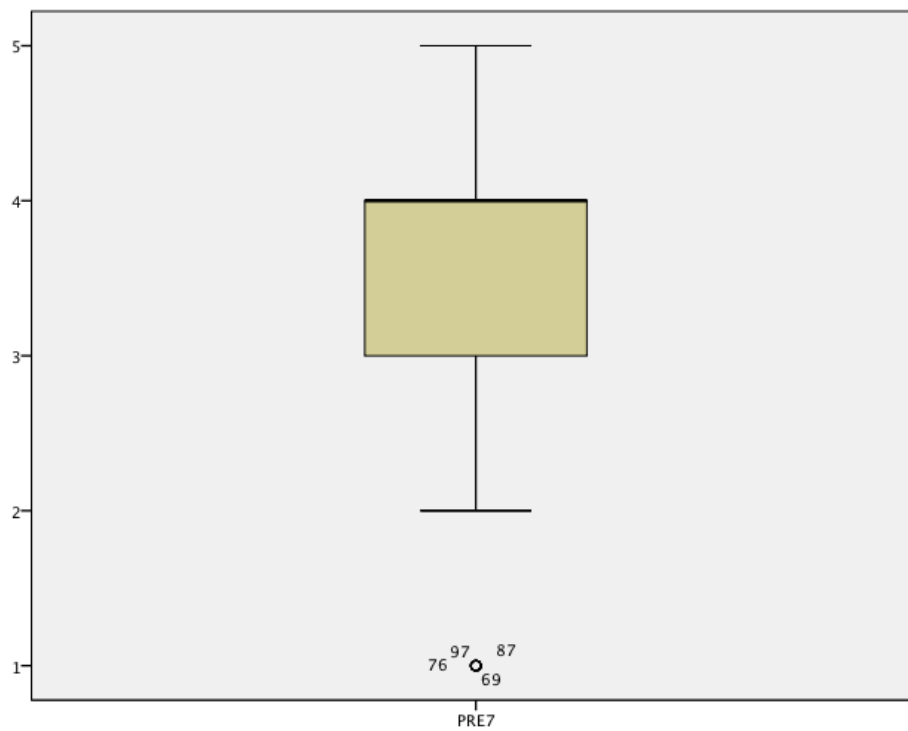
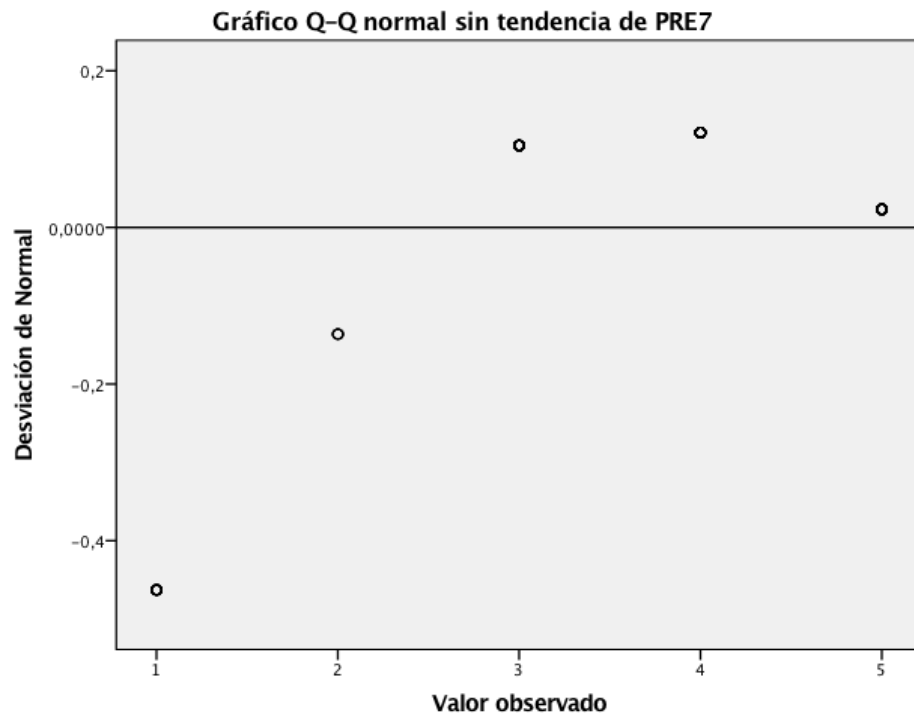
Pruebas de normalidad

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístico	gl	Sig.	Estadístico	gl	Sig.
PRE7	,203	100	,000	,872	100	,000

a. Corrección de significación de Lilliefors

PRE7





EXAMINE VARIABLES=POST7

```

/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 7	85	85,0%	15	15,0%	100	100,0%

Descriptivos

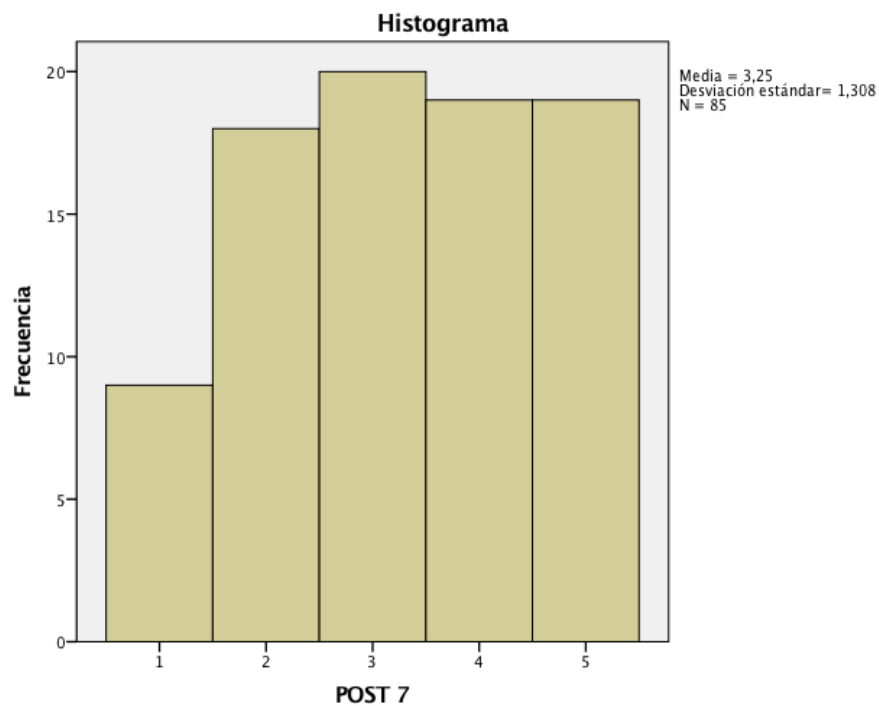
			Estadístico	Error estándar
POST 7	Media		3,25	,142
	95% de intervalo de confianza para la media	Límite inferior	2,96	
		Límite superior	3,53	
	Media recortada al 5%		3,27	
	Mediana		3,00	
	Varianza		1,712	
	Desviación estándar		1,308	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		-,146	,261
	Curtosis		-1,110	,517

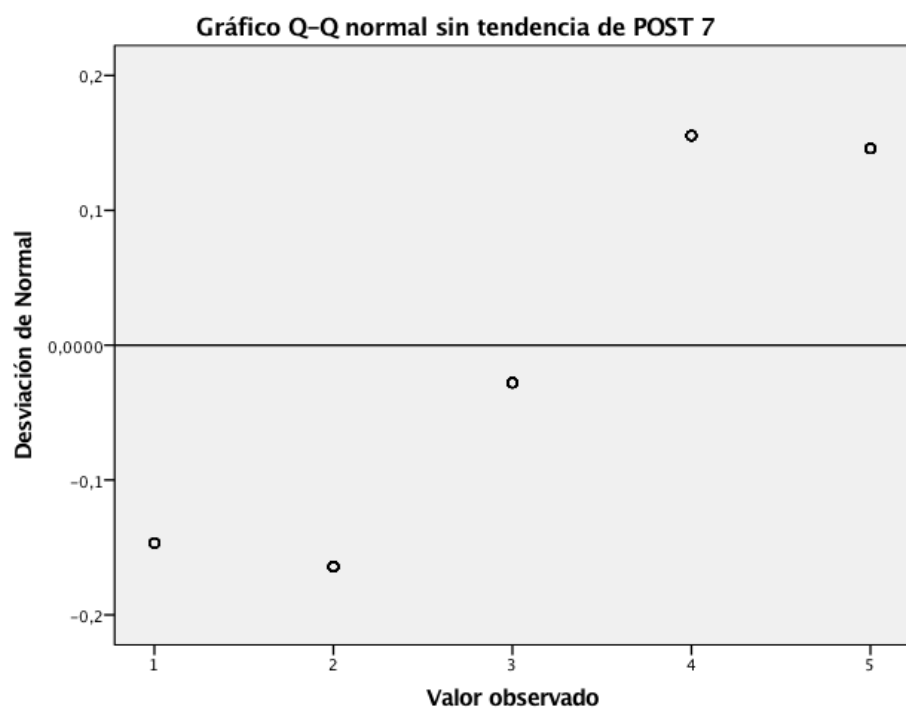
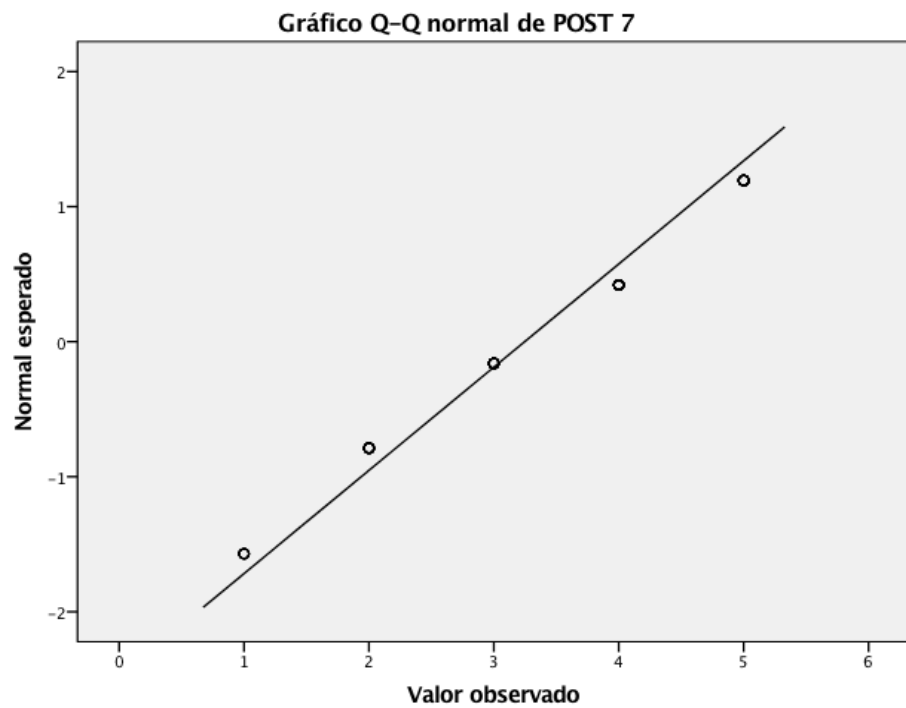
Pruebas de normalidad

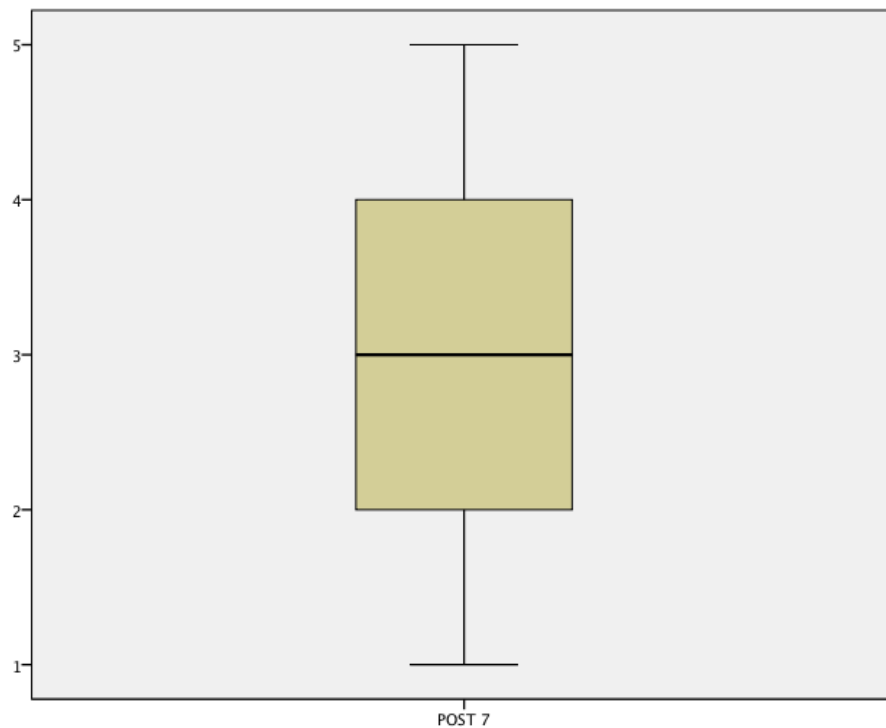
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 7	,165	85	,000	,899	85	,000

a. Corrección de significación de Lilliefors

POST 7







```

NPAR TESTS
  /WILCOXON=PRE7 WITH POST7 (PAIRED)
  /STATISTICS DESCRIPTIVES
  /MISSING ANALYSIS.

```

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE7	100	3,41	1,240	1	5
POST 7	85	3,25	1,308	1	5

Prueba de rangos con signo de Wilcoxon

Rangos

		N	Rango promedio	Suma de rangos
POST 7 - PRE7	Rangos negativos	34 ^a	33,01	1122,50
	Rangos positivos	29 ^b	30,81	893,50
	Empates	22 ^c		
	Total	85		

a. POST 7 < PRE7

b. POST 7 > PRE7

c. POST 7 = PRE7

Estadísticos de prueba^a

POST 7 -
PRE7

Z	-,798 ^b
Sig. asintótica (bilateral)	,425

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos positivos.

```
EXAMINE VARIABLES=PRE7
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

Válido		Casos Perdidos		Total	
N	Porcentaj e	N	Porcentaj e	N	Porcentaj e

PRE8	98	98,0%	2	2,0%	100	100,0%
------	----	-------	---	------	-----	--------

Descriptivos

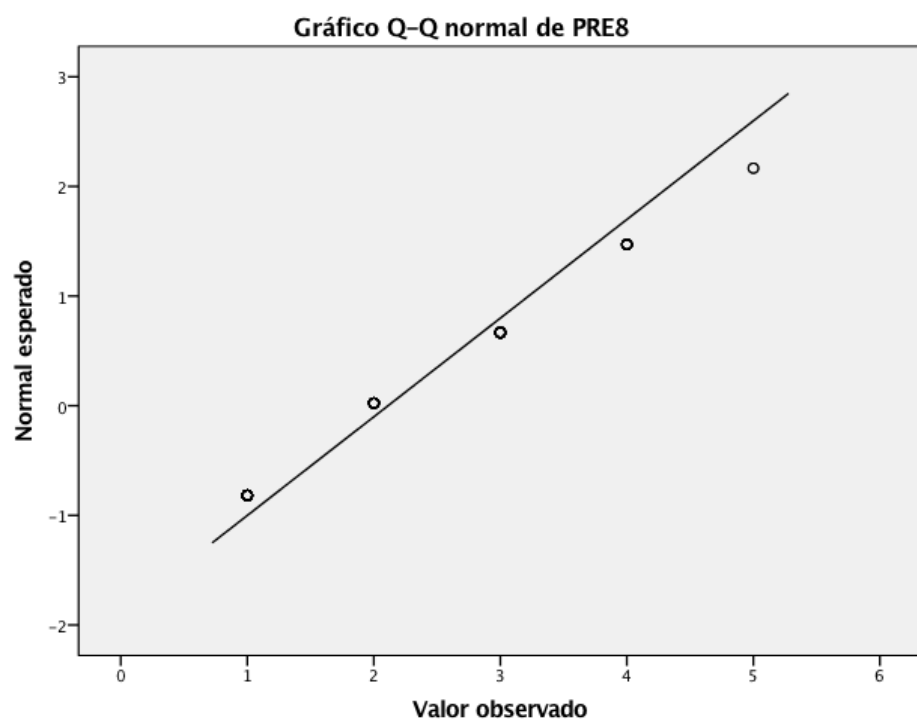
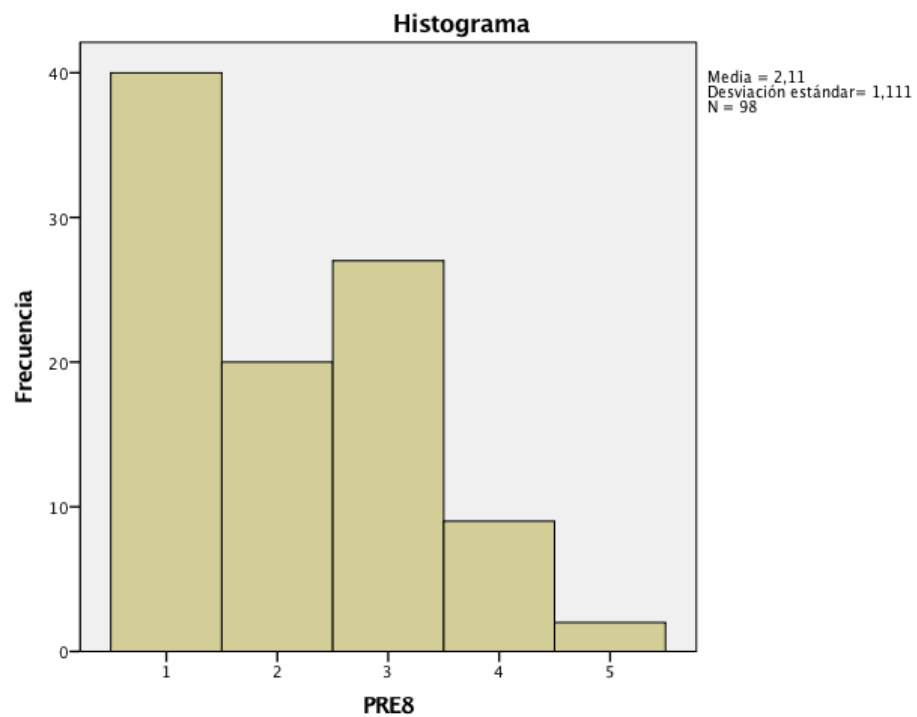
			Estadístico	Error estándar
PRE8	Media		2,11	,112
	95% de intervalo de confianza para la media	Límite inferior	1,89	
		Límite superior	2,34	
	Media recortada al 5%		2,05	
	Mediana		2,00	
	Varianza		1,235	
	Desviación estándar		1,111	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		,556	,244
	Curtosis		-,711	,483

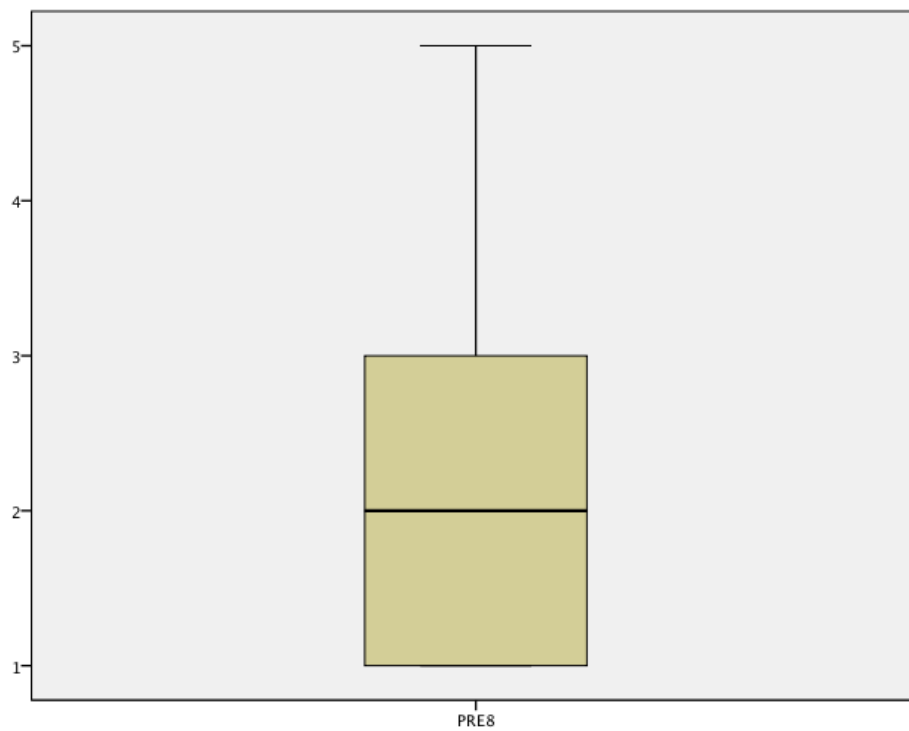
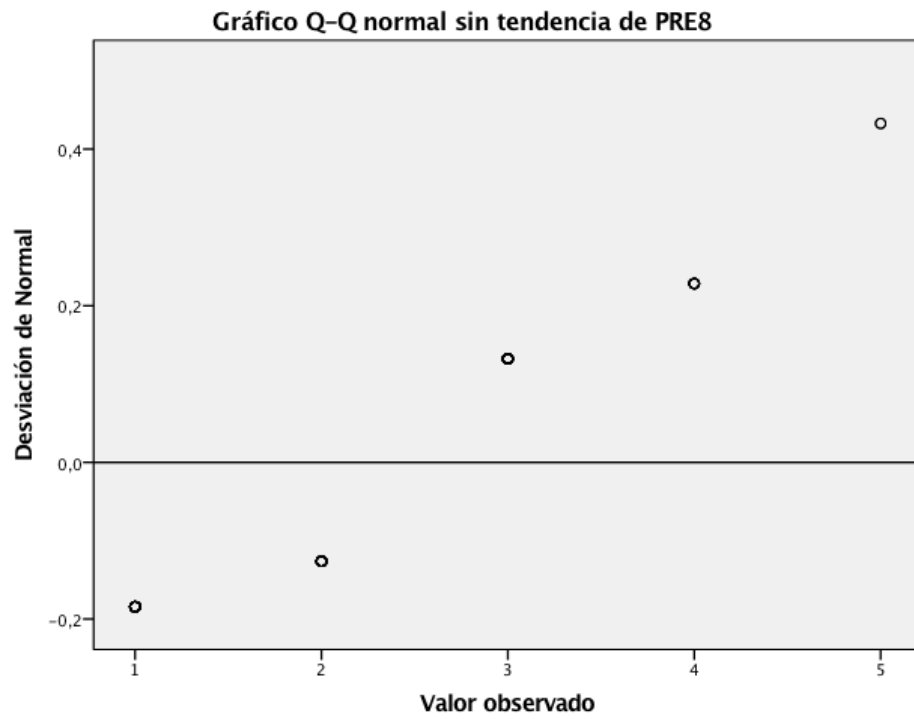
Pruebas de normalidad

Kolmogorov-Smirnov ^a			Shapiro-Wilk			
Estadístic			Estadístic			
o	gl	Sig.	o	gl	Sig.	
PRE8	,250	98	,000	,838	98	,000

a. Corrección de significación de Lilliefors

PRE8





EXAMINE VARIABLES=POST8

```

/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 8	78	78,0%	22	22,0%	100	100,0%

Descriptivos

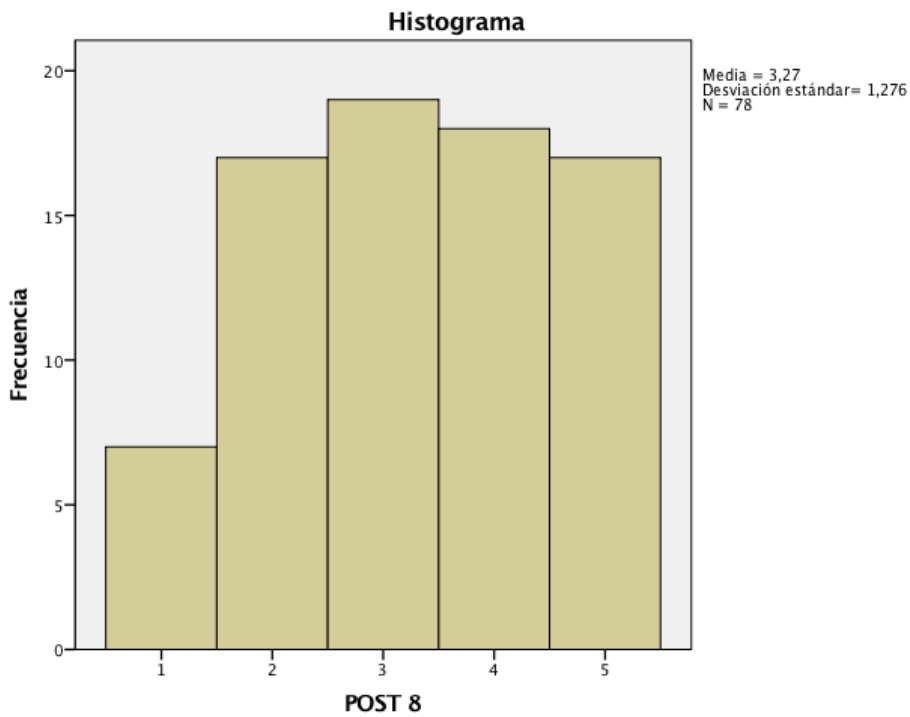
			Estadístico	Error estándar
POST 8	Media		3,27	,144
	95% de intervalo de confianza para la media	Límite inferior	2,98	
		Límite superior	3,56	
	Media recortada al 5%		3,30	
	Mediana		3,00	
	Varianza		1,628	
	Desviación estándar		1,276	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		-,140	,272
	Curtosis		-1,067	,538

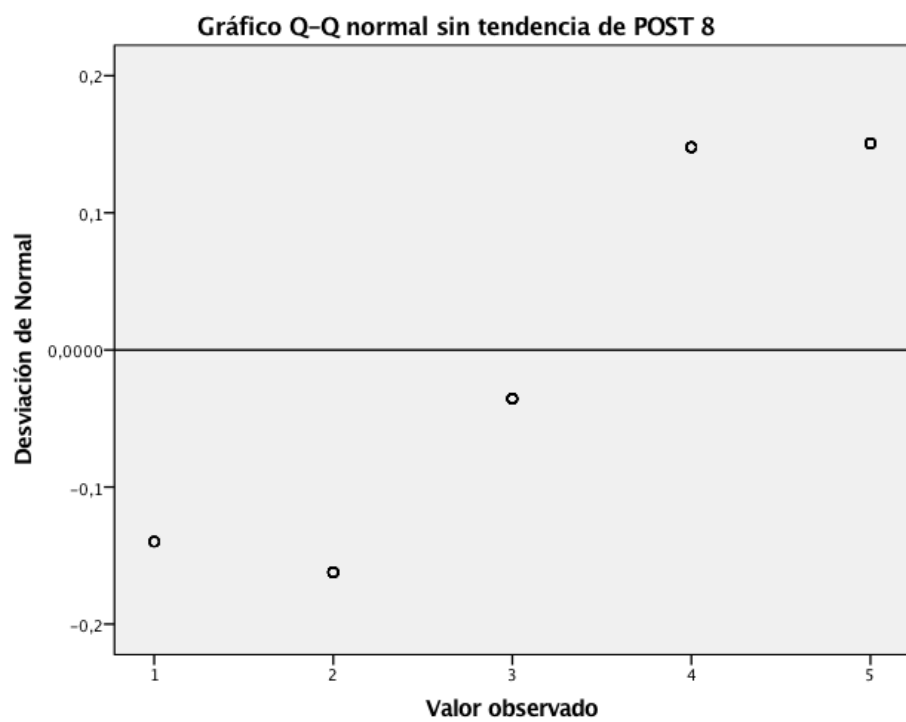
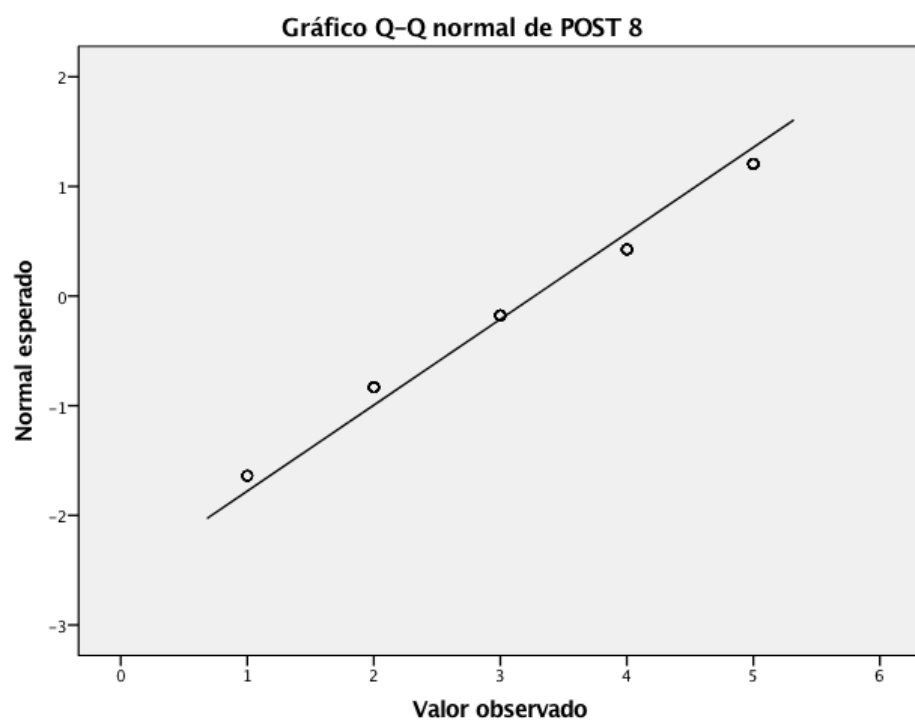
Pruebas de normalidad

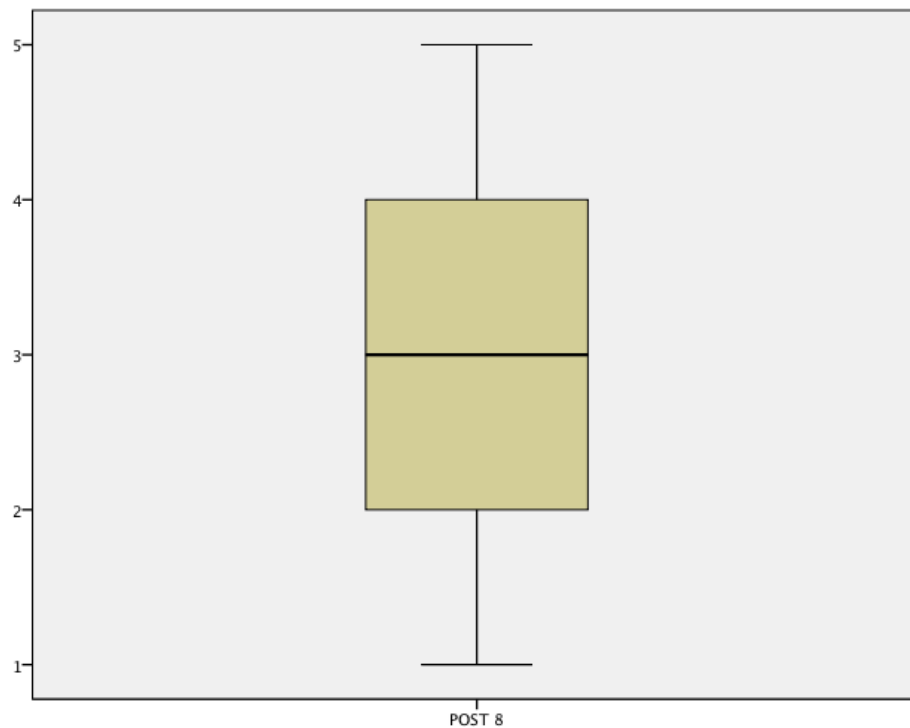
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 8	,165	78	,000	,902	78	,000

a. Corrección de significación de Lilliefors

POST 8







NPAR TESTS

/WILCOXON=PRE8 WITH POST8 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE8	98	2,11	1,111	1	5
POST 8	78	3,27	1,276	1	5

Prueba de rangos con signo de Wilcoxon

Rangos

	N	Rango promedio	Suma de rangos
--	---	-------------------	-------------------

POST 8 - PRE8	Rangos negativos	10 ^a	23,50	235,00
	Rangos positivos	53 ^b	33,60	1781,00
	Empates	13 ^c		
	Total	76		

a. POST 8 < PRE8

b. POST 8 > PRE8

c. POST 8 = PRE8

Estadísticos de prueba^a

POST 8 -
PRE8

Z	-5,380 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE9
/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE9	99	99,0%	1	1,0%	100	100,0%

Descriptivos

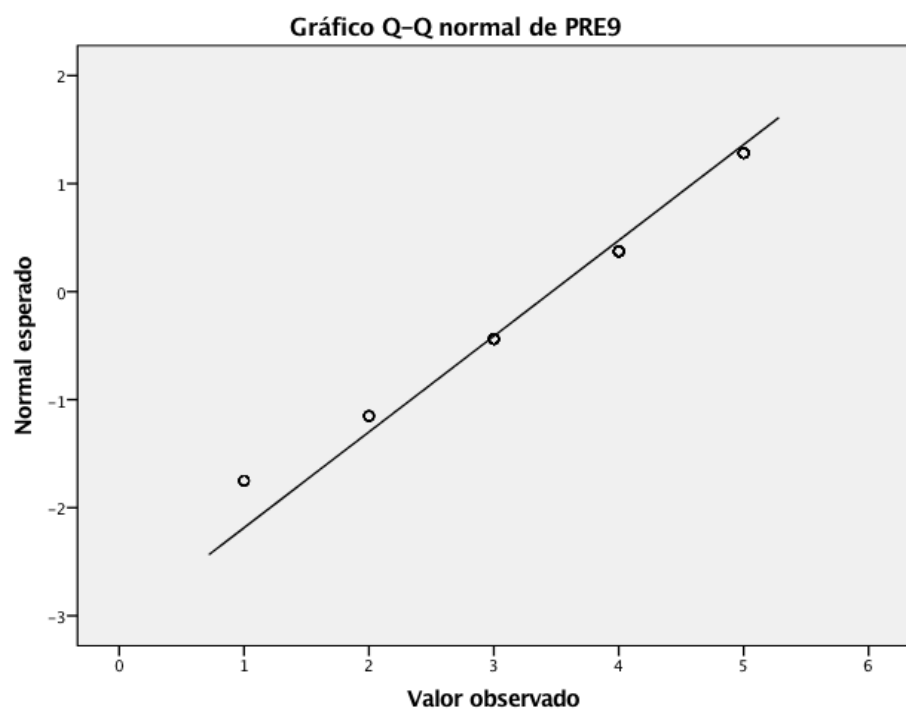
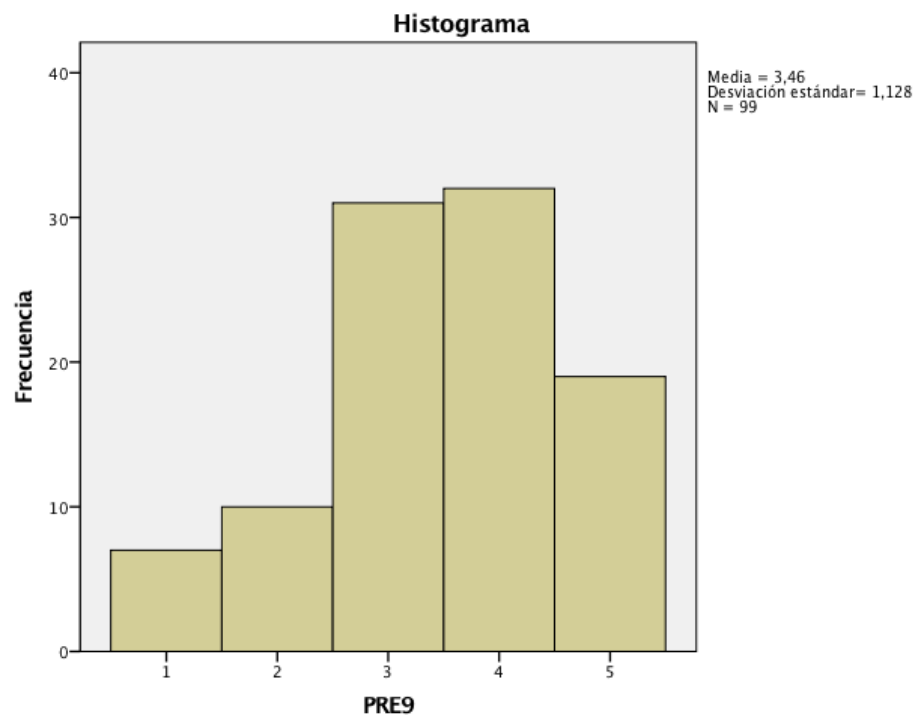
			Estadístico	Error estándar
PRE9	Media		3,46	,113
	95% de intervalo de confianza para la media	Límite inferior	3,24	
		Límite superior	3,69	
	Media recortada al 5%		3,52	
	Mediana		4,00	
	Varianza		1,272	
	Desviación estándar		1,128	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		-,477	,243
	Curtosis		-,317	,481

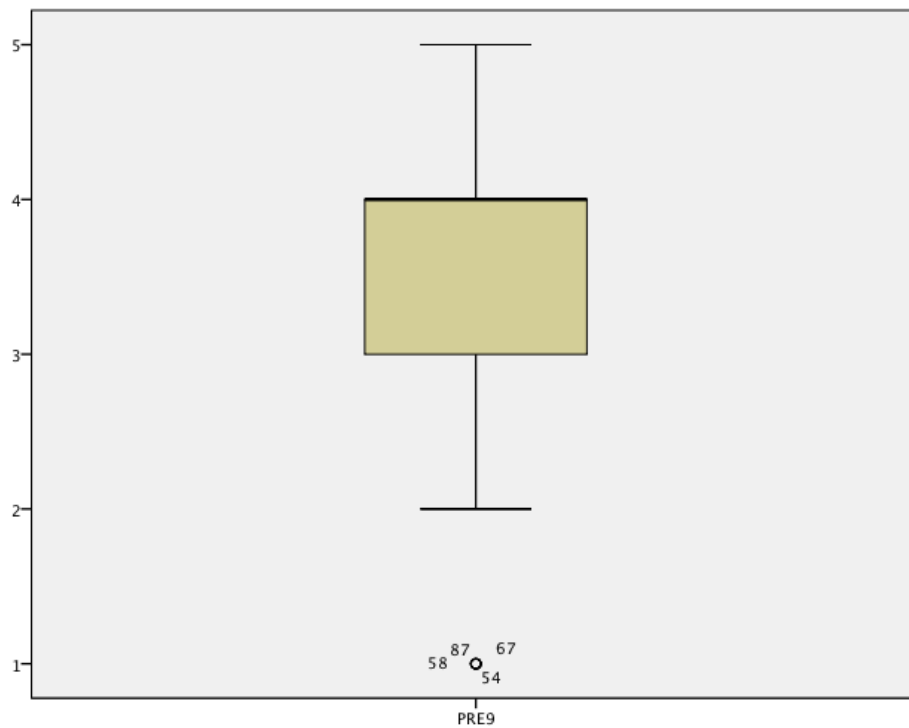
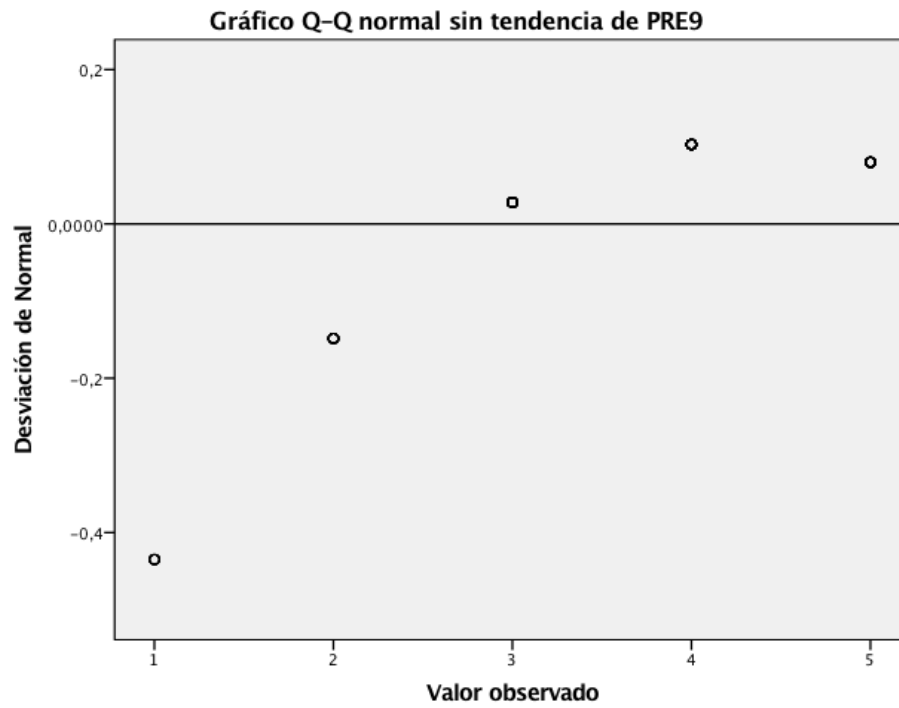
Pruebas de normalidad

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístico	gl	Sig.	Estadístico	gl	Sig.
	o			o		
PRE9	,198	99	,000	,895	99	,000

a. Corrección de significación de Lilliefors

PRE9





```
EXAMINE VARIABLES=POST9
      /PLOT BOXPLOT HISTOGRAM NPLOT
```

```

/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 9	100	100,0%	0	0,0%	100	100,0%

Descriptivos

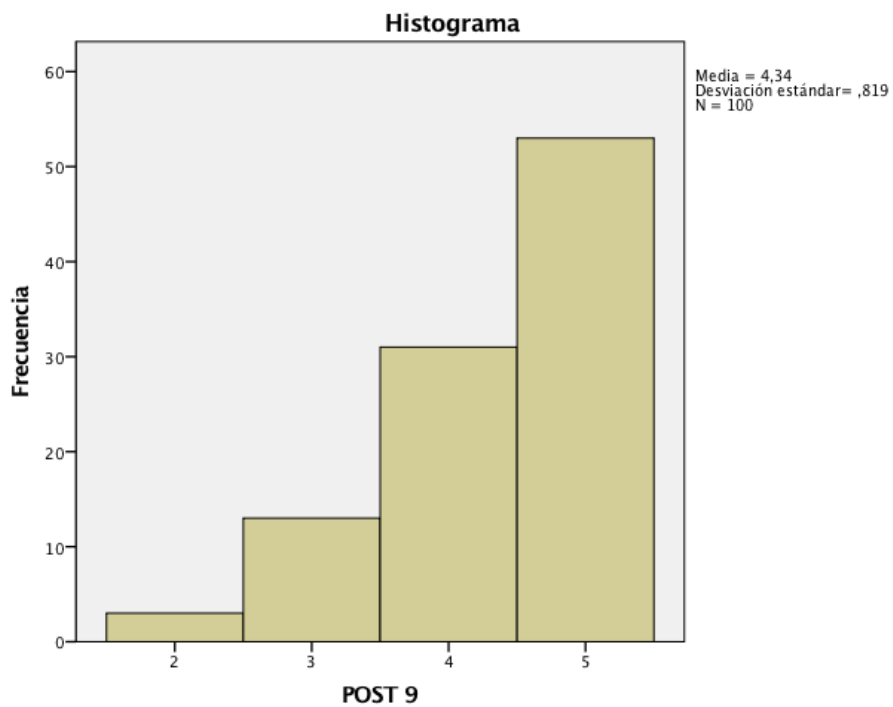
			Estadístico	Error estándar
POST 9	Media		4,34	,082
	95% de intervalo de confianza para la media	Límite inferior	4,18	
		Límite superior	4,50	
	Media recortada al 5%		4,41	
	Mediana		5,00	
	Varianza		,671	
	Desviación estándar		,819	
	Mínimo		2	
	Máximo		5	
	Rango		3	
	Rango intercuartil		1	
	Asimetría		-1,044	,241
	Curtosis		,298	,478

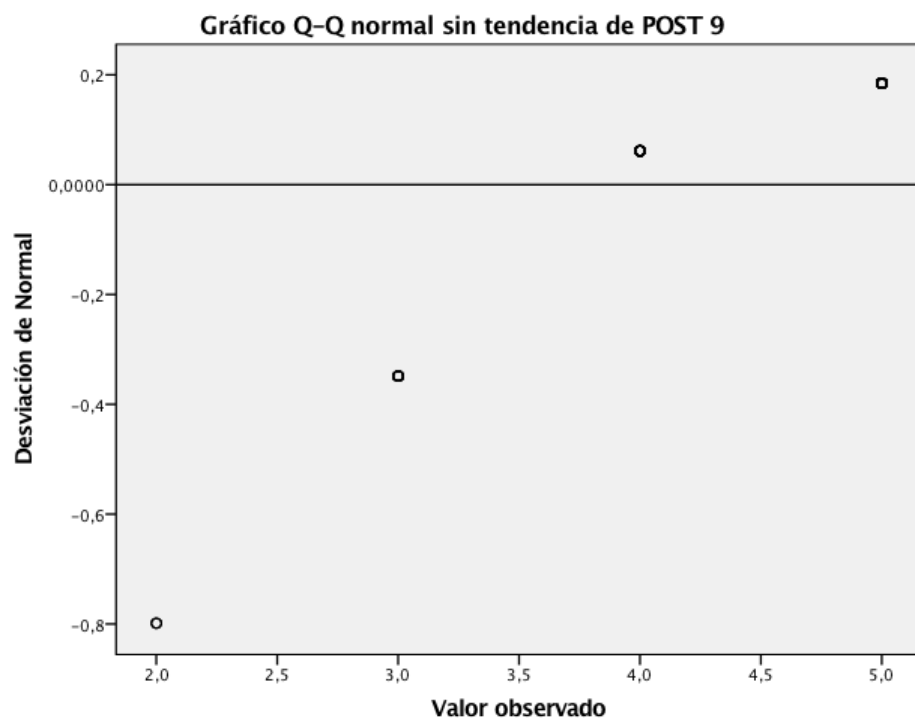
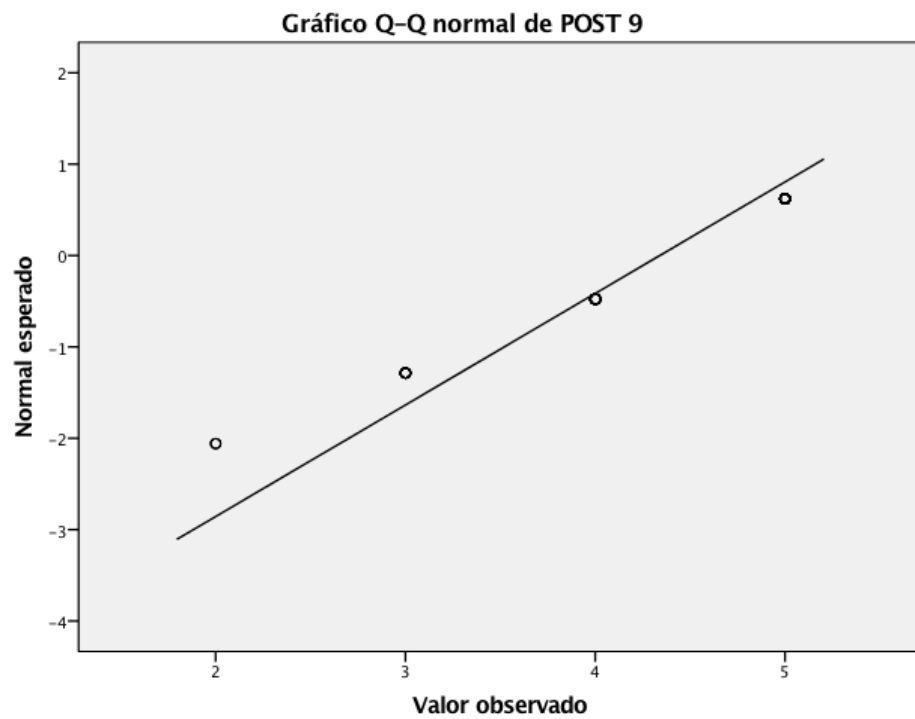
Pruebas de normalidad

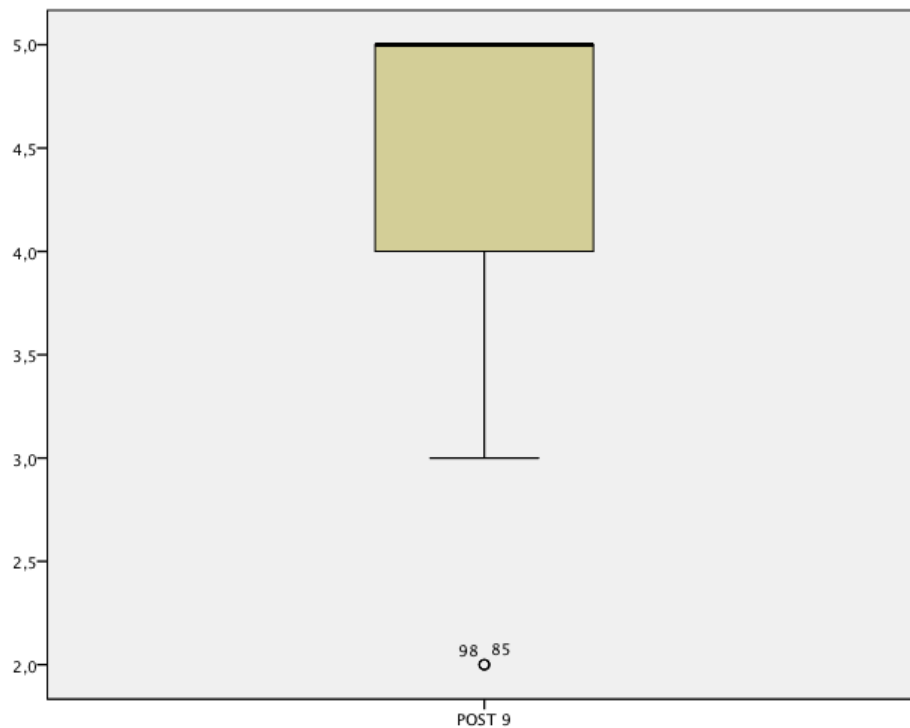
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 9	,320	100	,000	,758	100	,000

a. Corrección de significación de Lilliefors

POST 9







NPAR TESTS

/WILCOXON=PRE9 WITH POST9 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE9	99	3,46	1,128	1	5
POST 9	100	4,34	,819	2	5

Prueba de rangos con signo de Wilcoxon

Rangos

	N	Rango promedio	Suma de rangos
--	---	-------------------	-------------------

POST 9 - PRE9	Rangos negativos	12 ^a	19,67	236,00
	Rangos positivos	54 ^b	36,57	1975,00
	Empates	33 ^c		
	Total	99		

a. POST 9 < PRE9

b. POST 9 > PRE9

c. POST 9 = PRE9

Estadísticos de prueba^a

POST 9 -
PRE9

Z	-5,663 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE10
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE10	99	99,0%	1	1,0%	100	100,0%

Descriptivos

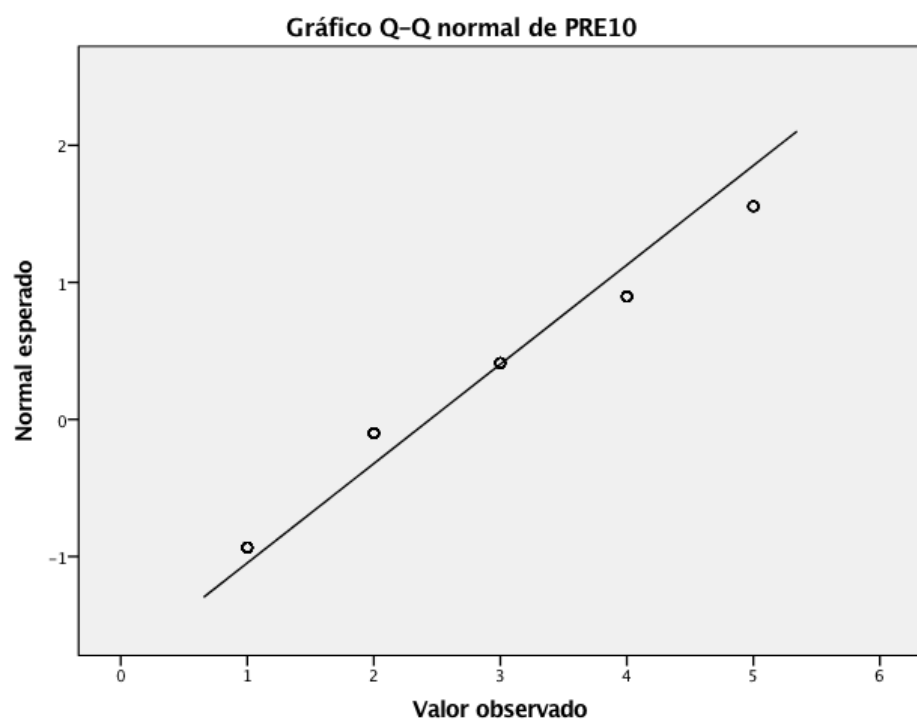
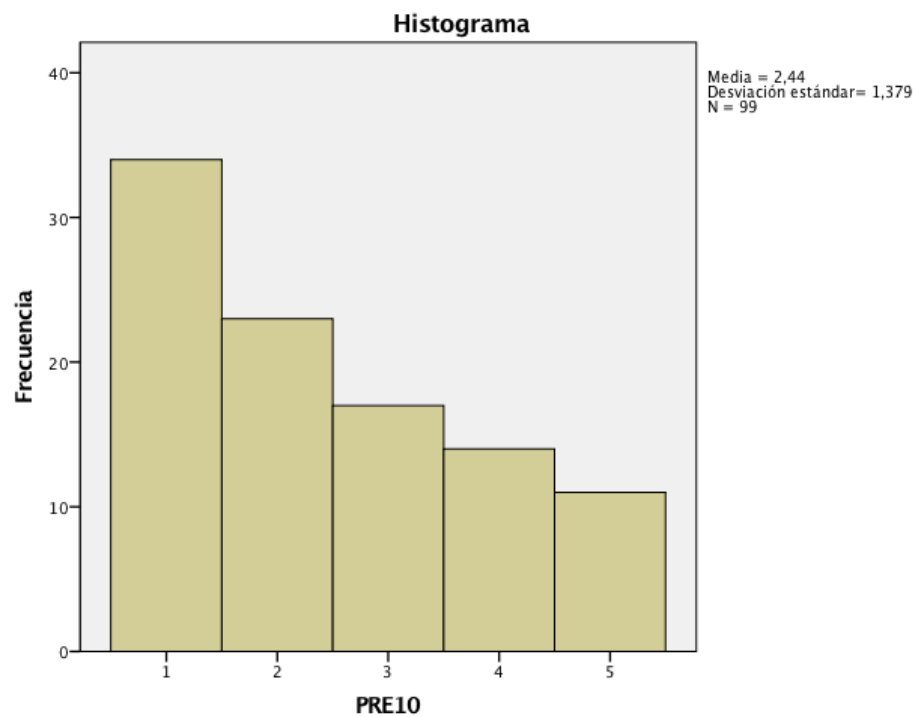
			Estadístico	Error estándar
PRE10	Media		2,44	,139
	95% de intervalo de confianza para la media	Límite inferior	2,17	
		Límite superior	2,72	
	Media recortada al 5%		2,38	
	Mediana		2,00	
	Varianza		1,902	
	Desviación estándar		1,379	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		3	
	Asimetría		,535	,243
	Curtosis		-,991	,481

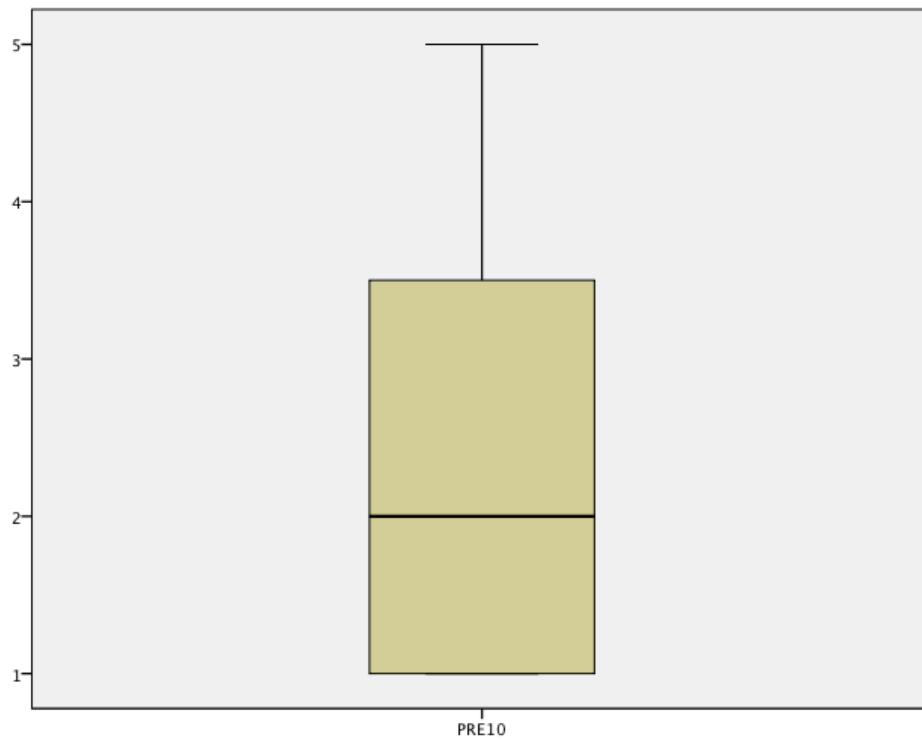
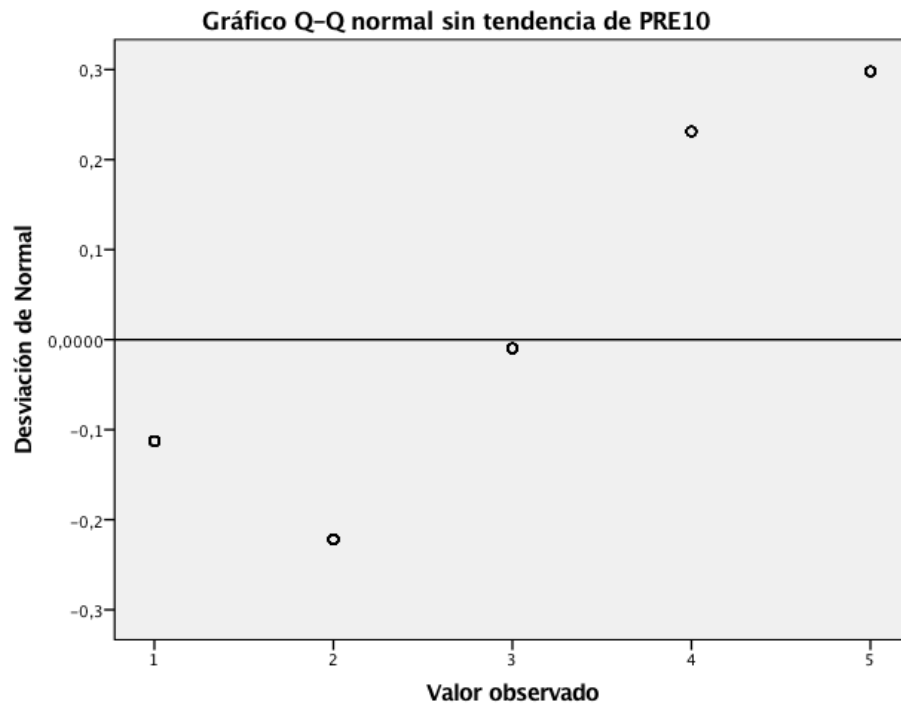
Pruebas de normalidad

Kolmogorov-Smirnov ^a				Shapiro-Wilk		
Estadístico				Estadístico		Sig.
	o	gl	Sig.		gl	Sig.
PRE10	,202	99	,000	,854	99	,000

a. Corrección de significación de Lilliefors

PRE10





EXAMINE VARIABLES=POST10

```

/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 10	97	97,0%	3	3,0%	100	100,0%

Descriptivos

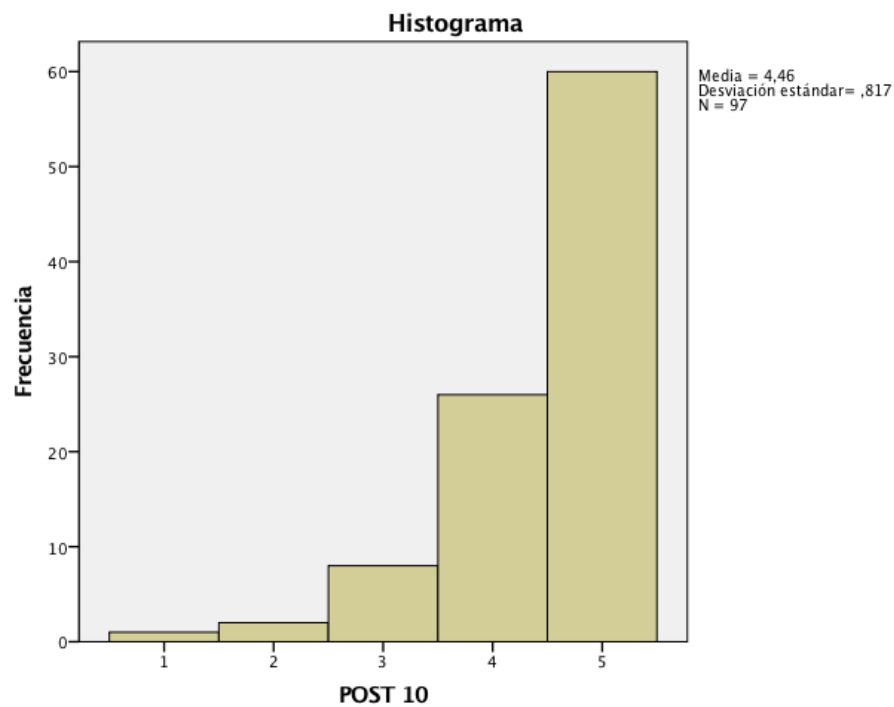
			Estadístico	Error estándar
POST 10	Media		4,46	,083
	95% de intervalo de confianza para la media	Límite inferior	4,30	
		Límite superior	4,63	
	Media recortada al 5%		4,56	
	Mediana		5,00	
	Varianza		,668	
	Desviación estándar		,817	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		-1,752	,245
	Curtosis		3,380	,485

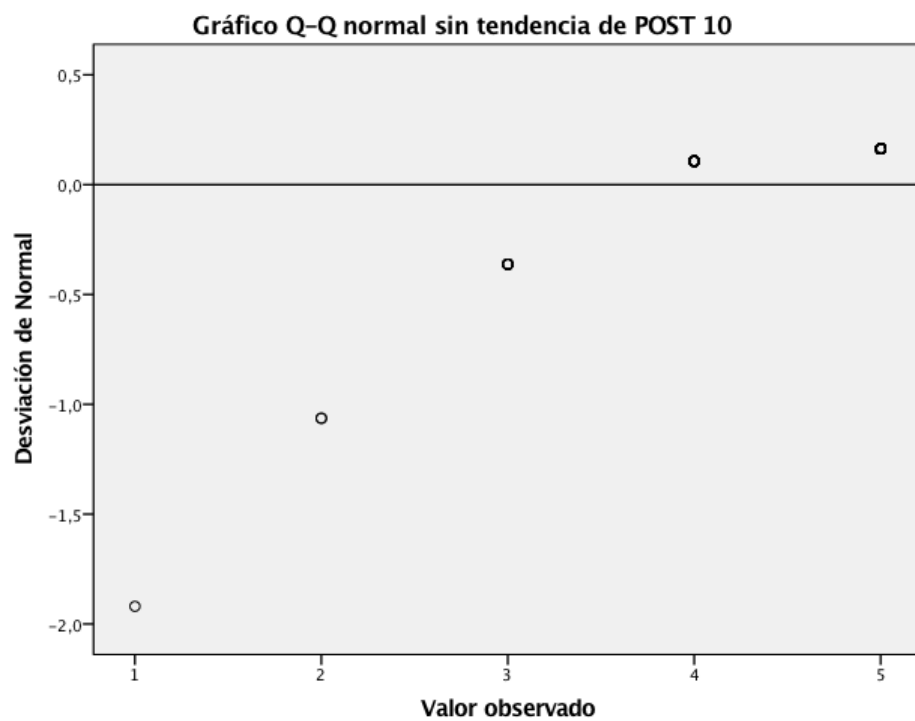
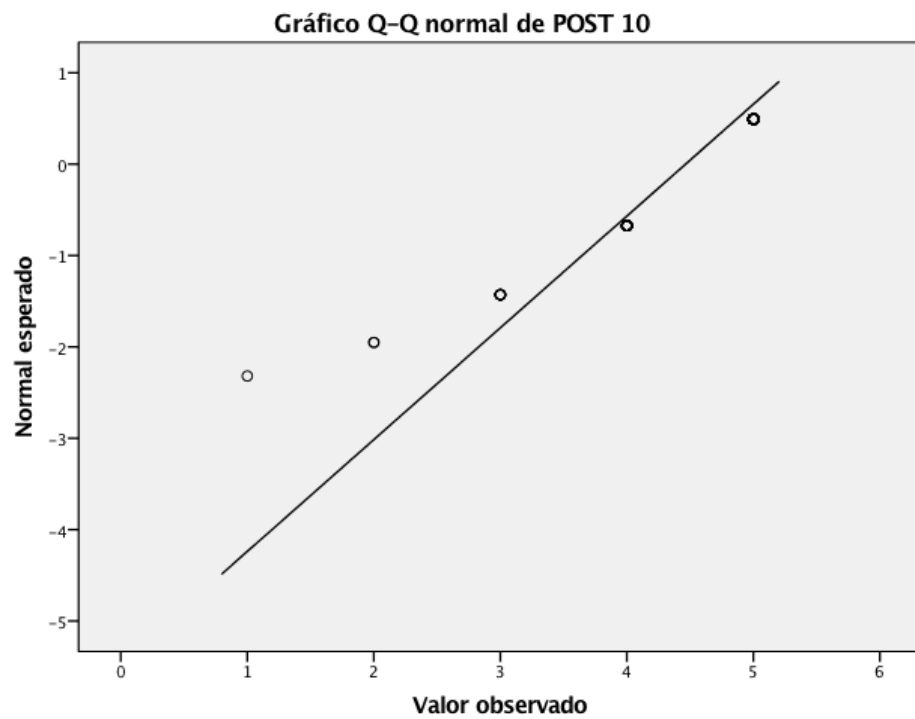
Pruebas de normalidad

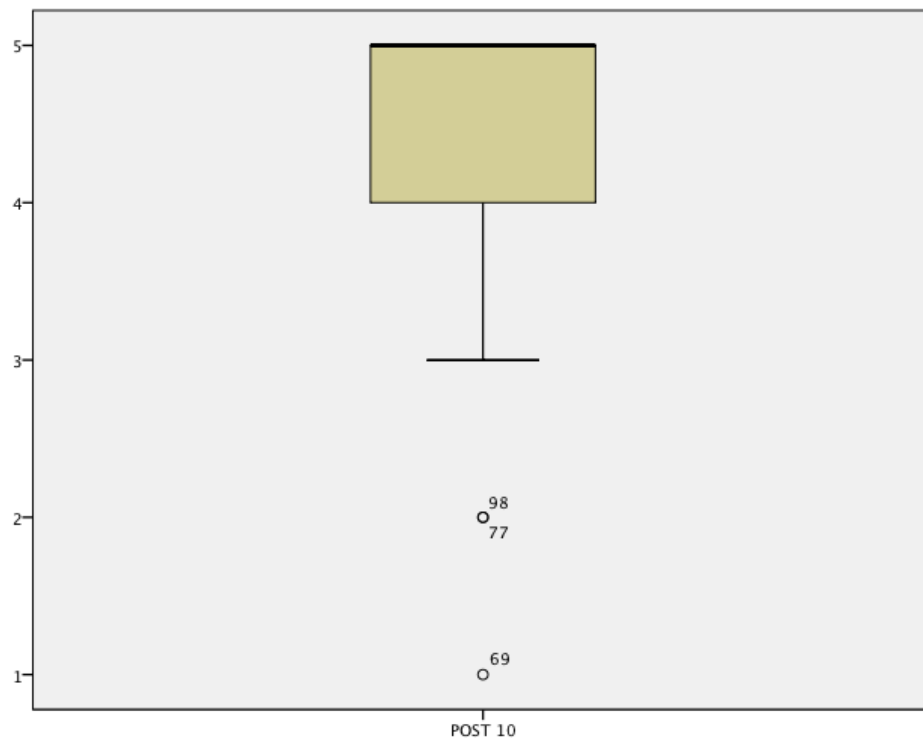
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 10	,363	97	,000	,682	97	,000

a. Corrección de significación de Lilliefors

POST 10







NPART TESTS

```

/WILCOXON=PRE10 WITH POST10 (PAIRED)
/STATISTICS DESCRIPTIVES
/MISSING ANALYSIS.

```

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE10	99	2,44	1,379	1	5
POST 10	97	4,46	,817	1	5

Prueba de rangos con signo de Wilcoxon

Rangos

N	Rango promedio	Suma de rangos
---	-------------------	-------------------

POST 10 - PRE10	Rangos negativos	6 ^a	19,08	114,50
	Rangos positivos	80 ^b	45,33	3626,50
	Empates	10 ^c		
	Total	96		

a. POST 10 < PRE10

b. POST 10 > PRE10

c. POST 10 = PRE10

Estadísticos de prueba^a

POST 10 -
PRE10

Z	-7,623 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE11
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE11	100	100,0%	0	0,0%	100	100,0%

Descriptivos

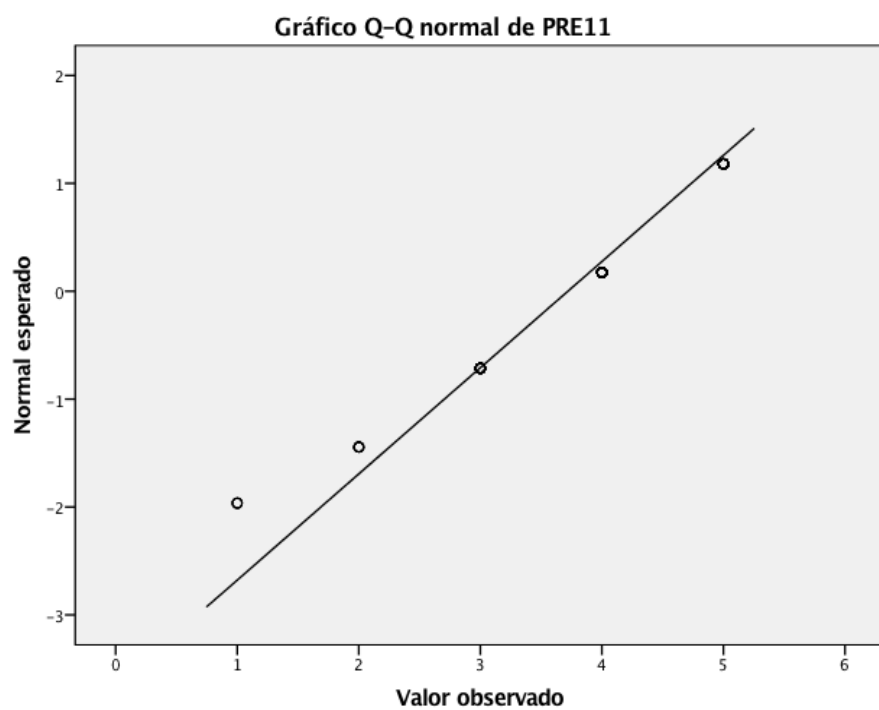
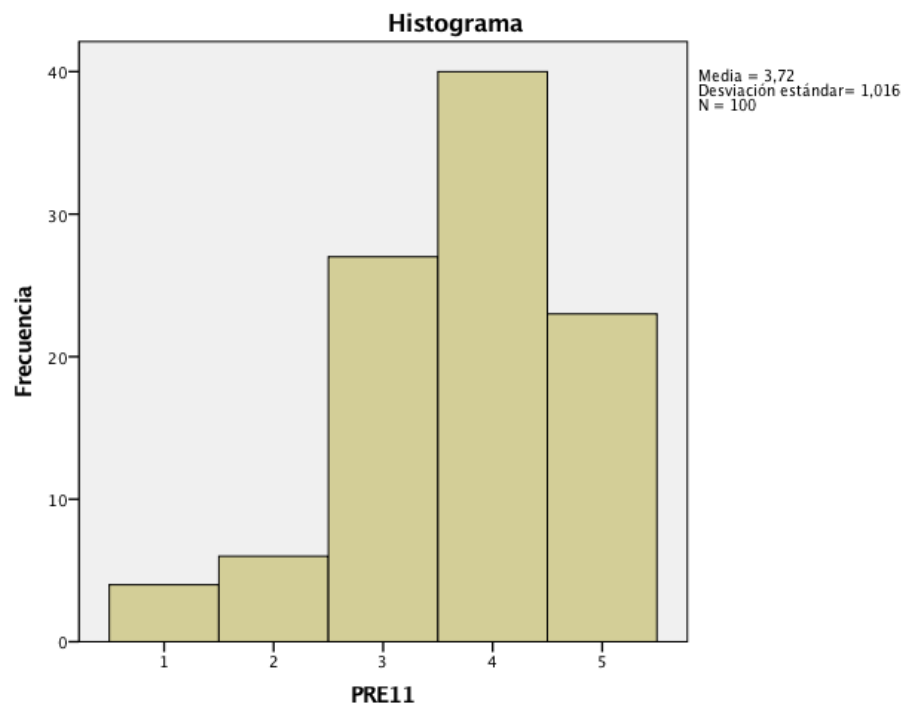
			Estadístico	Error estándar
PRE11	Media		3,72	,102
	95% de intervalo de confianza para la media	Límite inferior	3,52	
		Límite superior	3,92	
	Media recortada al 5%		3,79	
	Mediana		4,00	
	Varianza		1,032	
	Desviación estándar		1,016	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		-,708	,241
	Curtosis		,341	,478

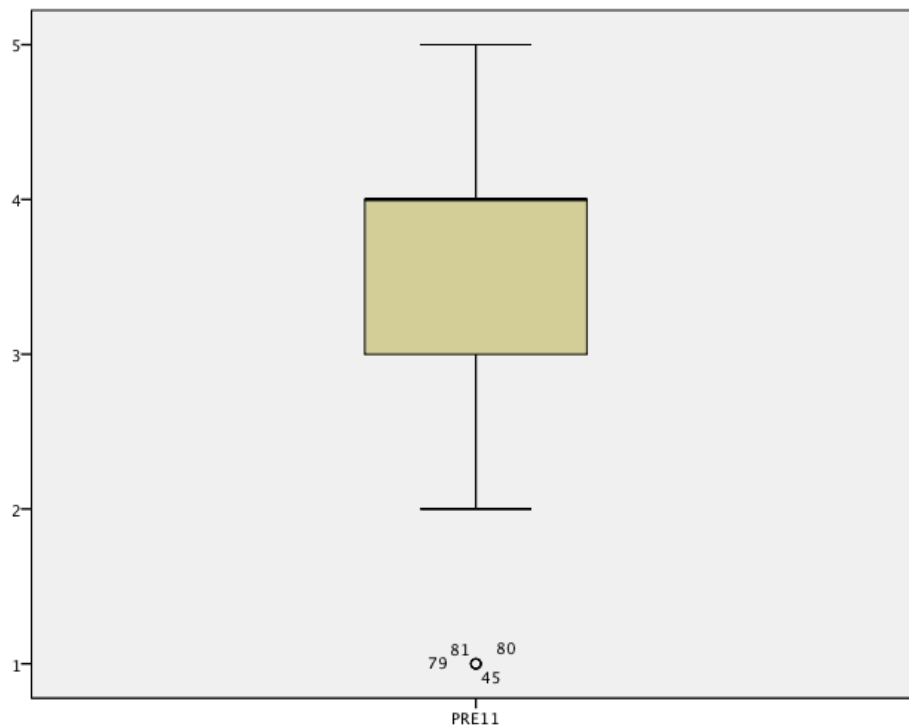
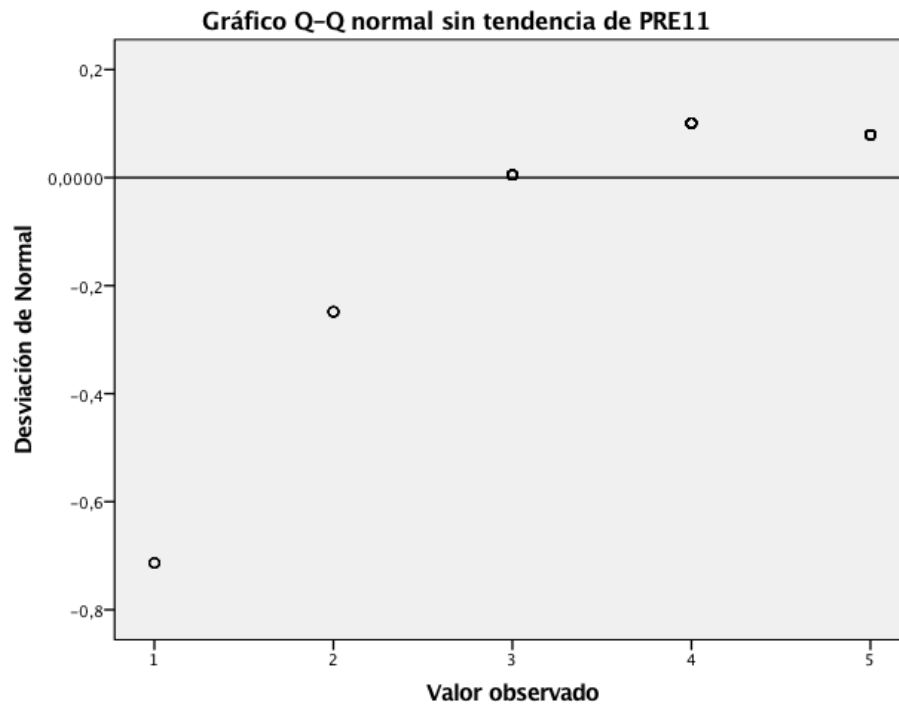
Pruebas de normalidad

Kolmogorov-Smirnov ^a			Shapiro-Wilk		
Estadístic			Estadístic		
o	gl	Sig.	o	gl	Sig.
PRE11	,239	100	,871	100	,000

a. Corrección de significación de Lilliefors

PRE11





```
EXAMINE VARIABLES=POST11  
/PLOT BOXPLOT HISTOGRAM NPLOT
```

```

/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 11	100	100,0%	0	0,0%	100	100,0%

Descriptivos

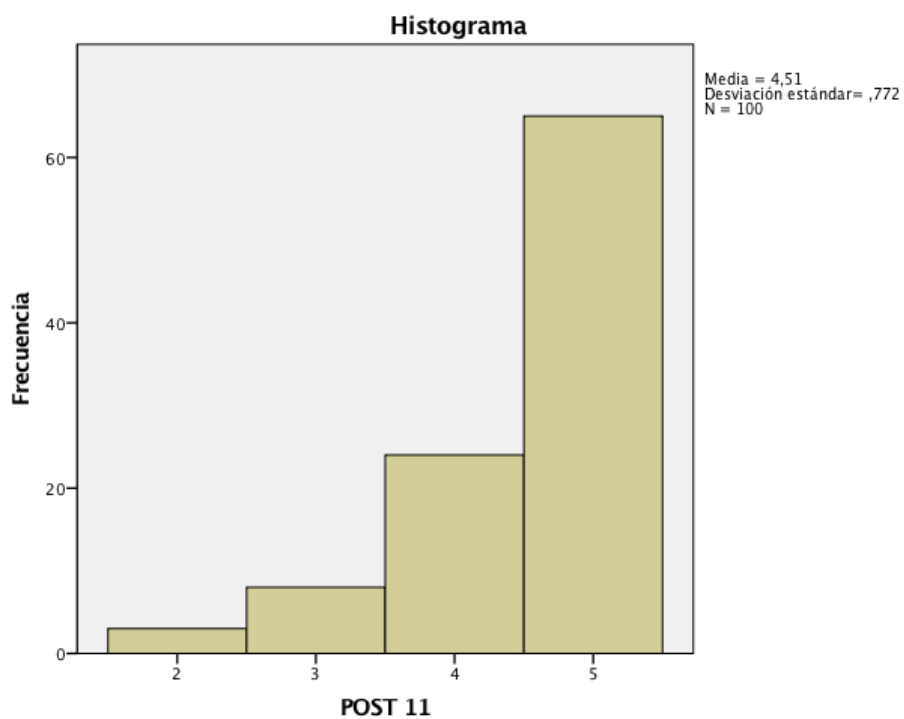
			Estadístico	Error estándar
POST 11	Media		4,51	,077
	95% de intervalo de confianza para la media	Límite inferior	4,36	
		Límite superior	4,66	
	Media recortada al 5%		4,60	
	Mediana		5,00	
	Varianza		,596	
	Desviación estándar		,772	
	Mínimo		2	
	Máximo		5	
	Rango		3	
	Rango intercuartil		1	
	Asimetría		-1,580	,241
	Curtosis		1,926	,478

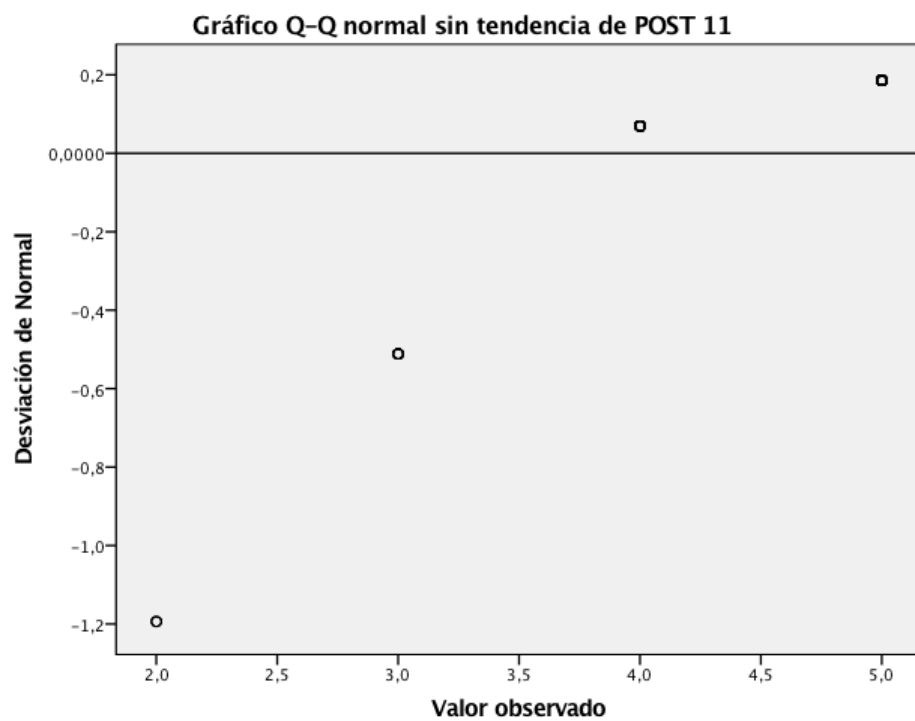
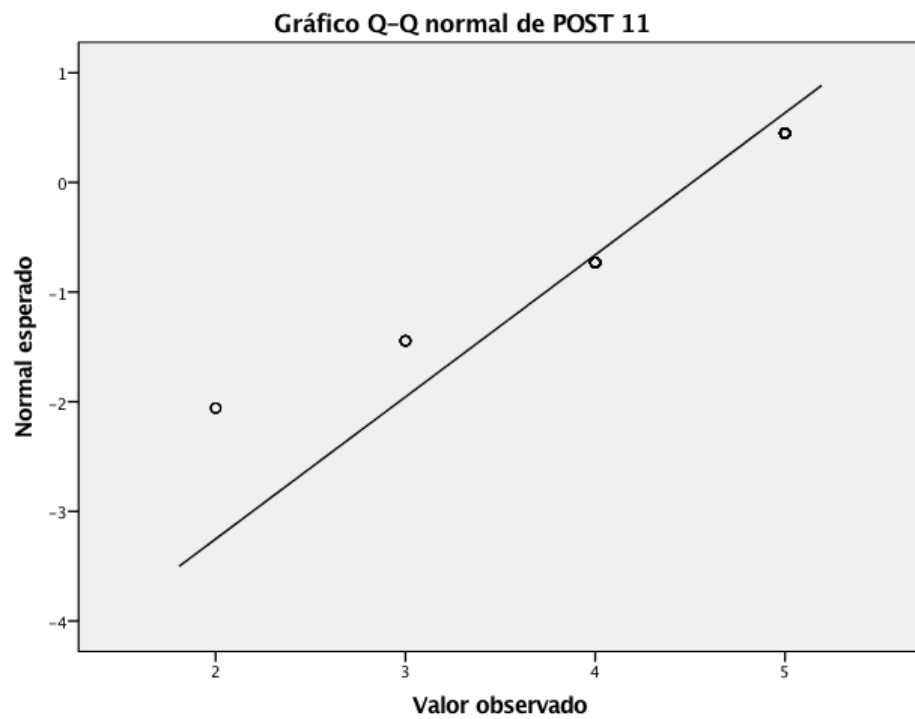
Pruebas de normalidad

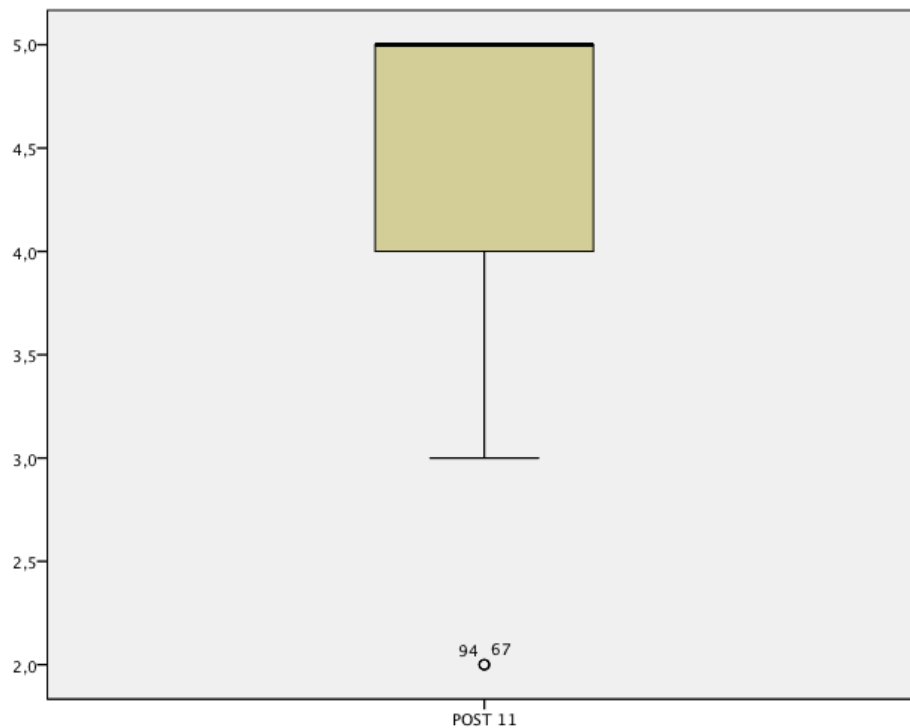
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 11	,387	100	,000	,666	100	,000

a. Corrección de significación de Lilliefors

POST 11







```

NPAR TESTS
  /WILCOXON=PRE11 WITH POST11 (PAIRED)
  /STATISTICS DESCRIPTIVES
  /MISSING ANALYSIS.

```

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE11	100	3,72	1,016	1	5
POST 11	100	4,51	,772	2	5

Prueba de rangos con signo de Wilcoxon

Rangos

		N	Rango promedio	Suma de rangos
POST 11 - PRE11	Rangos negativos	11 ^a	26,86	295,50
	Rangos positivos	59 ^b	37,11	2189,50
	Empates	30 ^c		
	Total	100		

a. POST 11 < PRE11

b. POST 11 > PRE11

c. POST 11 = PRE11

Estadísticos de prueba^a

POST 11 - PRE11	
Z	-5,769 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE12
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

Válido		Casos Perdidos		Total	
N	Porcentaje	N	Porcentaje	N	Porcentaje
	e		e		e

PRE12	99	99,0%	1	1,0%	100	100,0%
-------	----	-------	---	------	-----	--------

Descriptivos

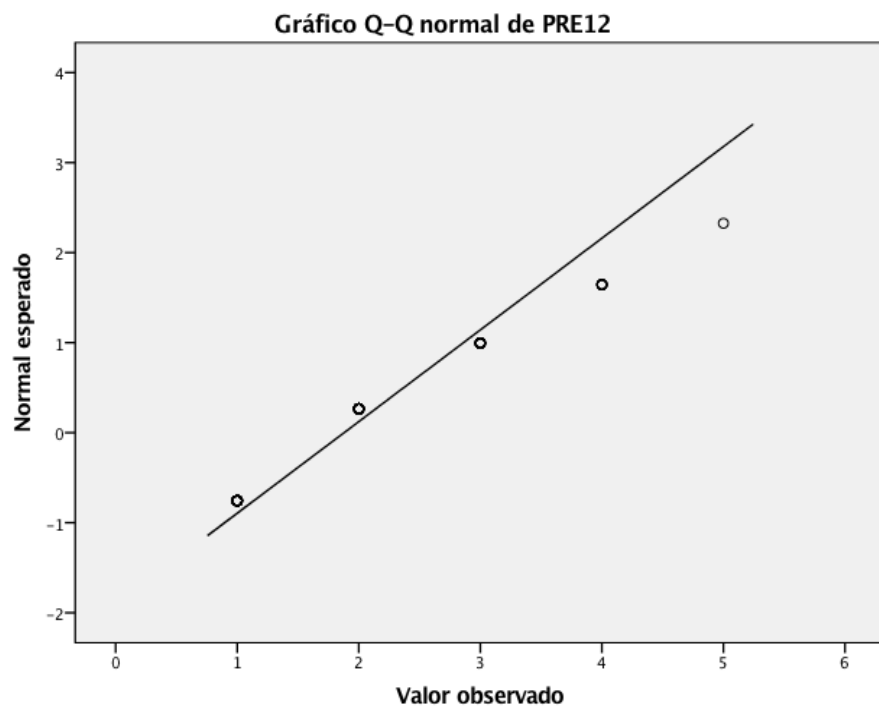
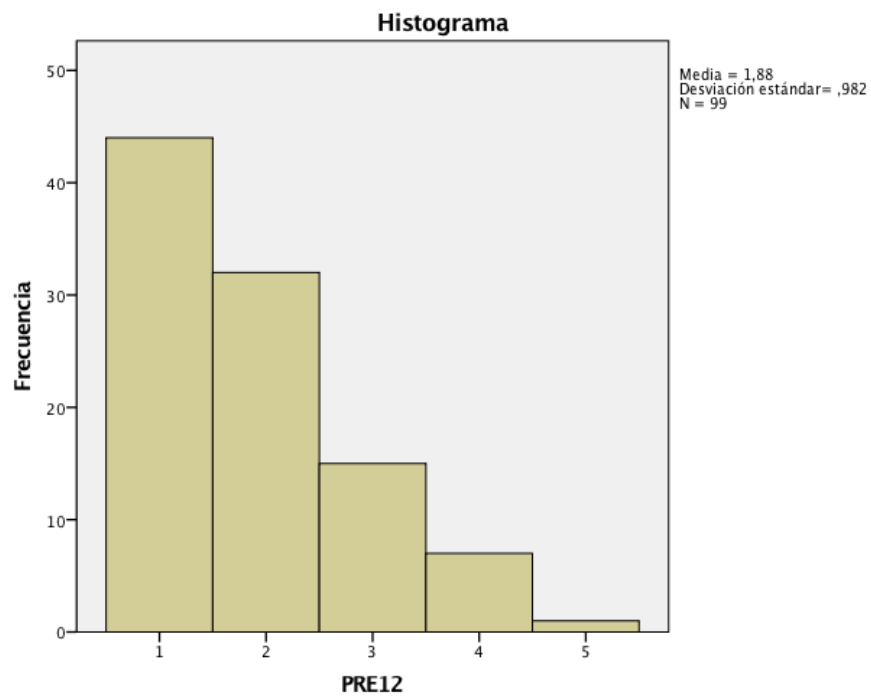
			Estadístico	Error estándar
PRE12	Media		1,88	,099
	95% de intervalo de confianza para la media	Límite inferior	1,68	
		Límite superior	2,07	
	Media recortada al 5%		1,80	
	Mediana		2,00	
	Varianza		,965	
	Desviación estándar		,982	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		,973	,243
	Curtosis		,246	,481

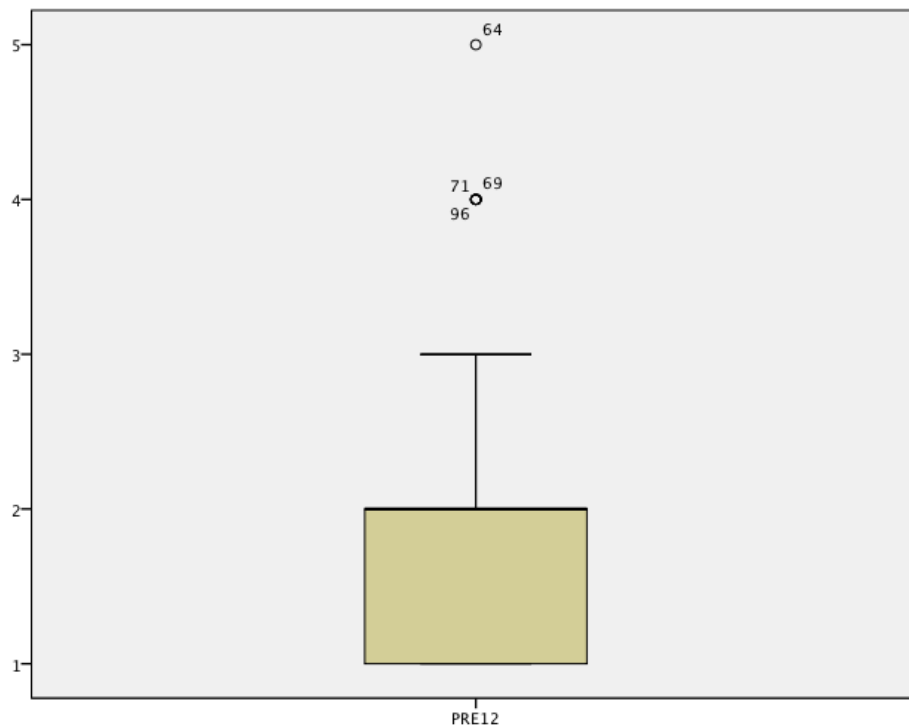
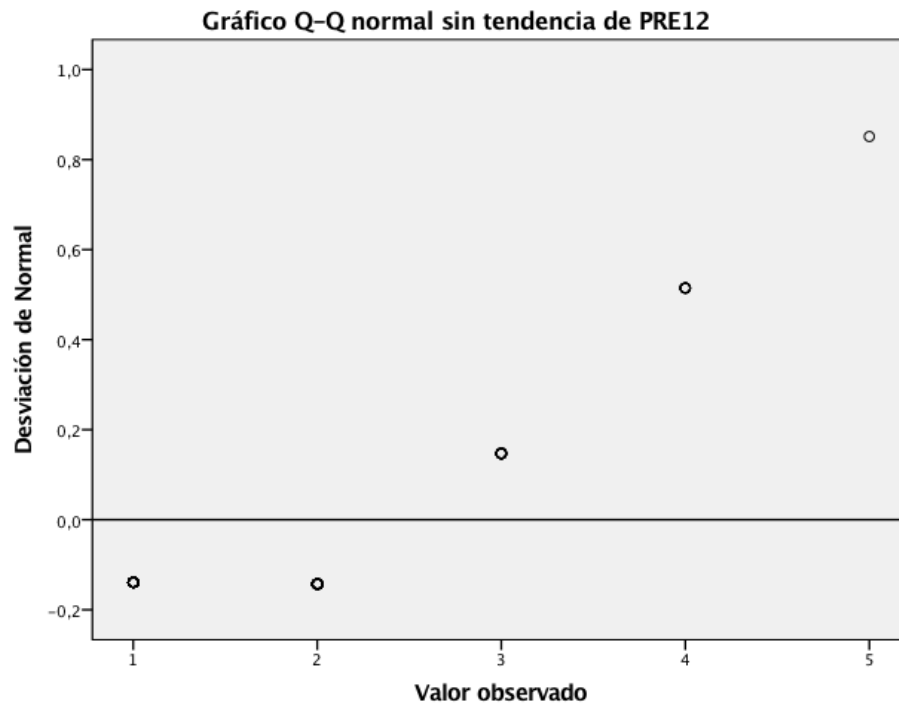
Pruebas de normalidad

Kolmogorov-Smirnov ^a			Shapiro-Wilk			
Estadístic			Estadístic			
o	gl	Sig.	o	gl	Sig.	
PRE12	,259	99	,000	,807	99	,000

a. Corrección de significación de Lilliefors

PRE12





```
EXAMINE VARIABLES=POST12  
/PLOT BOXPLOT HISTOGRAM NPLOT
```

```

/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 12	100	100,0%	0	0,0%	100	100,0%

Descriptivos

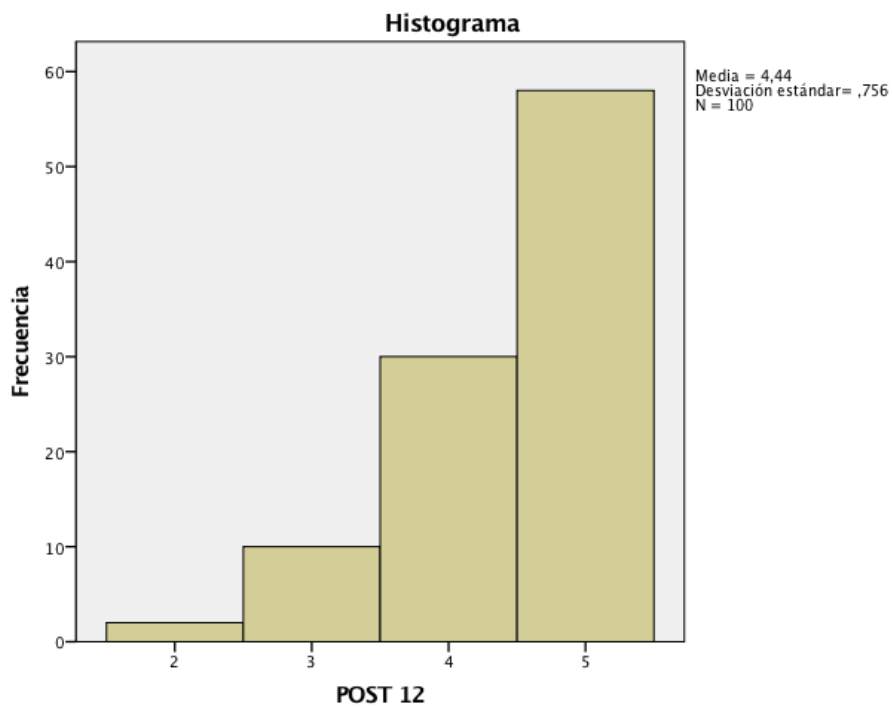
			Estadístico	Error estándar
POST 12	Media		4,44	,076
	95% de intervalo de confianza para la media	Límite inferior	4,29	
		Límite superior	4,59	
	Media recortada al 5%		4,51	
	Mediana		5,00	
	Varianza		,572	
	Desviación estándar		,756	
	Mínimo		2	
	Máximo		5	
	Rango		3	
	Rango intercuartil		1	
	Asimetría		-1,221	,241
	Curtosis		,865	,478

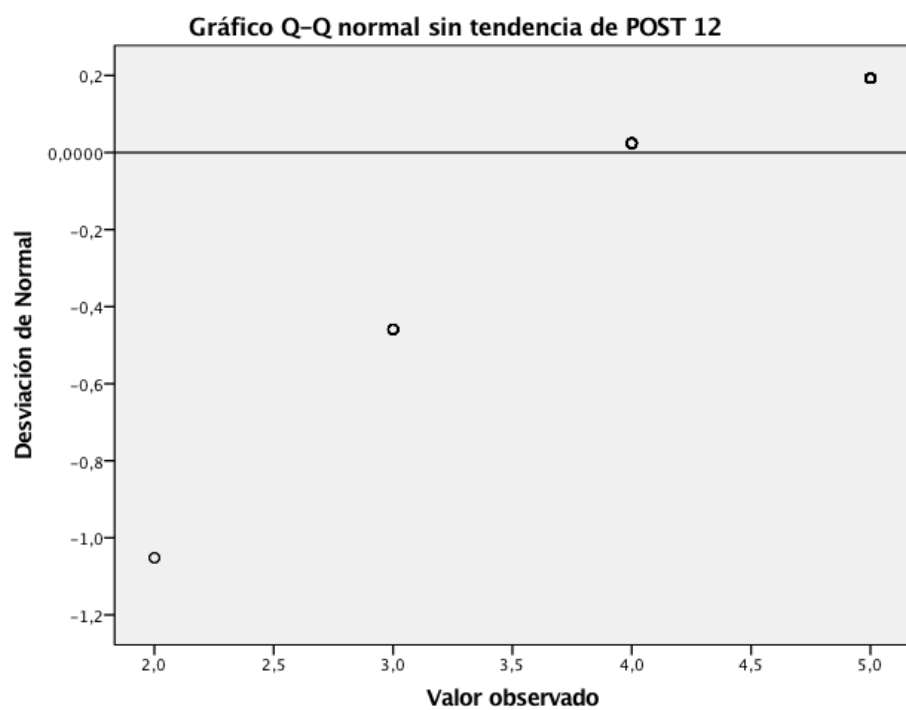
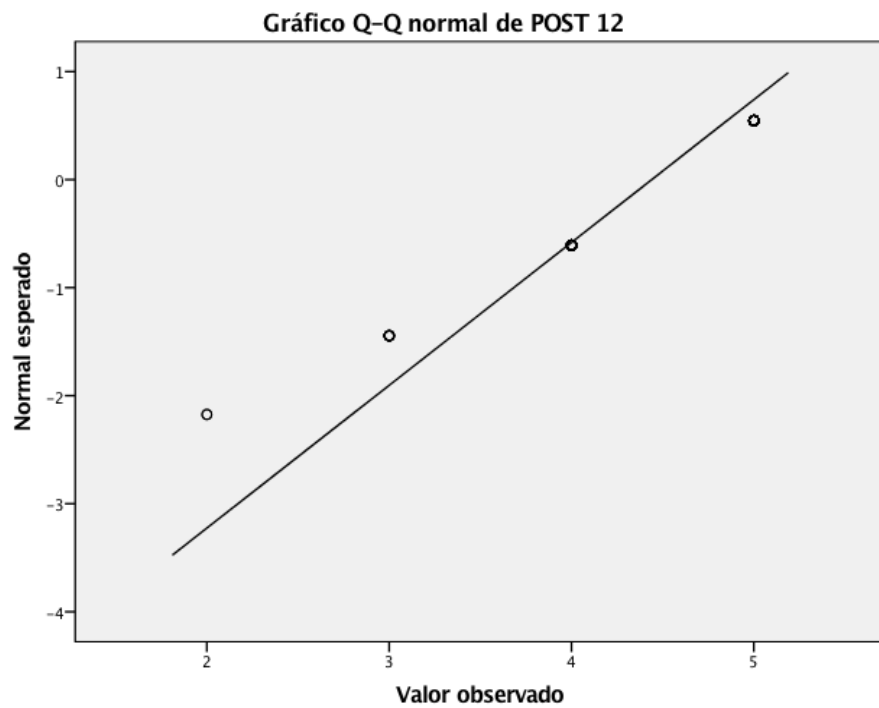
Pruebas de normalidad

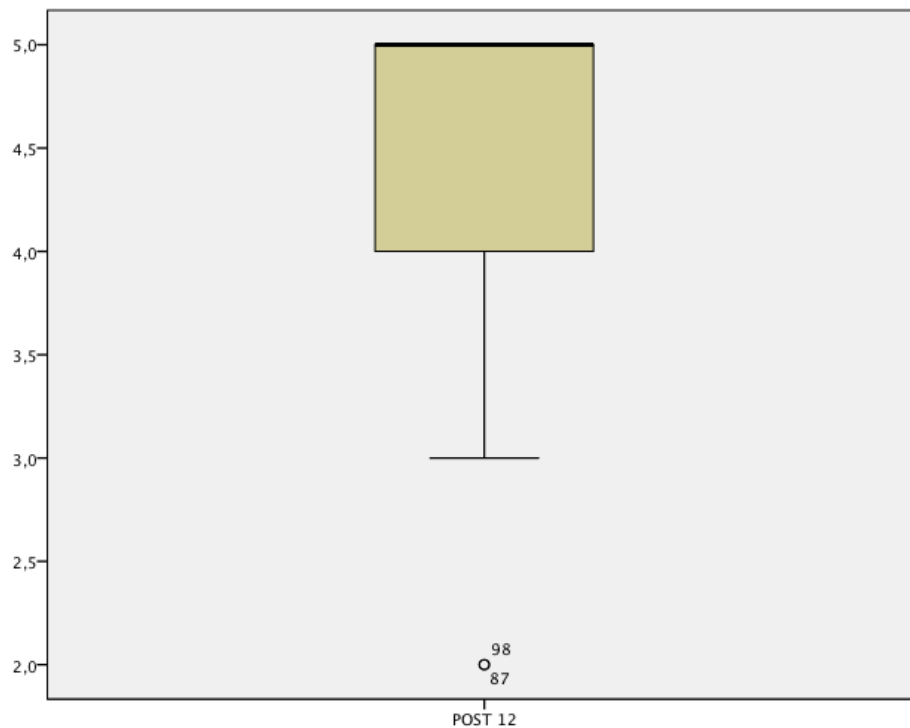
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic o	gl	Sig.	Estadístic o	gl	Sig.
POST 12	,350	100	,000	,723	100	,000

a. Corrección de significación de Lilliefors

POST 12







NPAR TESTS

```

/WILCOXON=PRE12 WITH POST12 (PAIRED)
/STATISTICS DESCRIPTIVES
/MISSING ANALYSIS.

```

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE12	99	1,88	,982	1	5
POST 12	100	4,44	,756	2	5

Prueba de rangos con signo de Wilcoxon

Rangos

	N	Rango promedio	Suma de rangos
--	---	-------------------	-------------------

POST 12 - PRE12	Rangos negativos	0 ^a	,00	,00
	Rangos positivos	96 ^b	48,50	4656,00
	Empates	3 ^c		
	Total	99		

a. POST 12 < PRE12

b. POST 12 > PRE12

c. POST 12 = PRE12

Estadísticos de prueba^a

POST 12 -
PRE12

Z	-8,591 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE13
/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE13	99	99,0%	1	1,0%	100	100,0%

Descriptivos

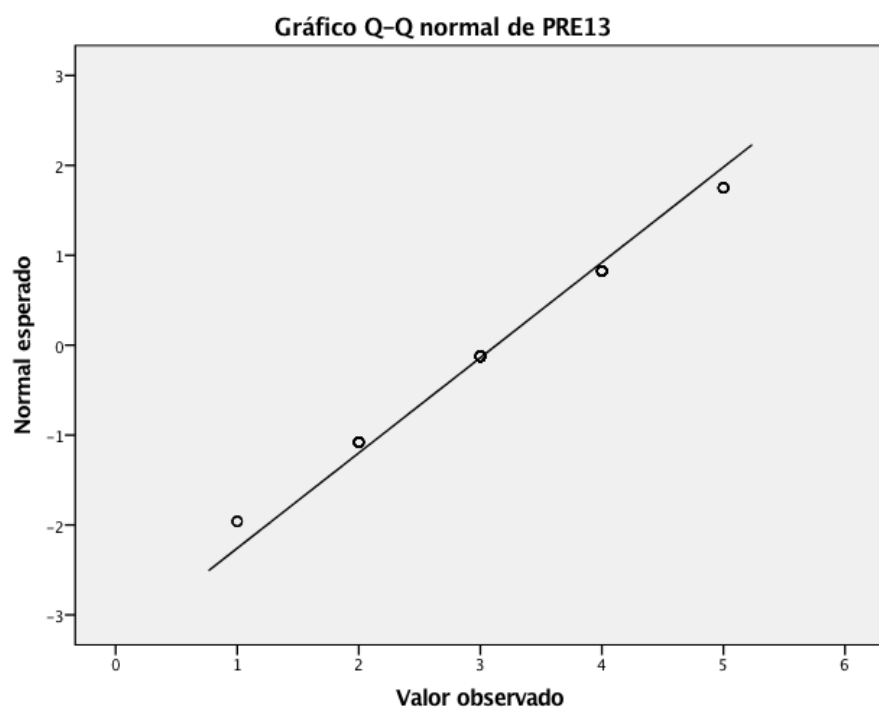
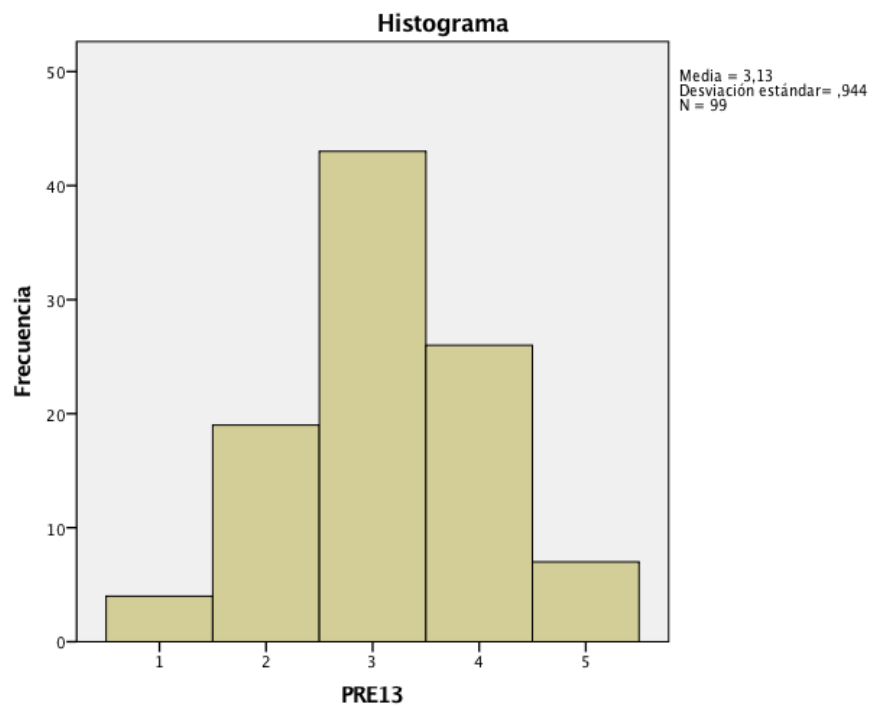
			Estadístico	Error estándar
PRE13	Media		3,13	,095
	95% de intervalo de confianza para la media	Límite inferior	2,94	
		Límite superior	3,32	
	Media recortada al 5%		3,14	
	Mediana		3,00	
	Varianza		,891	
	Desviación estándar		,944	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		-,045	,243
	Curtosis		-,170	,481

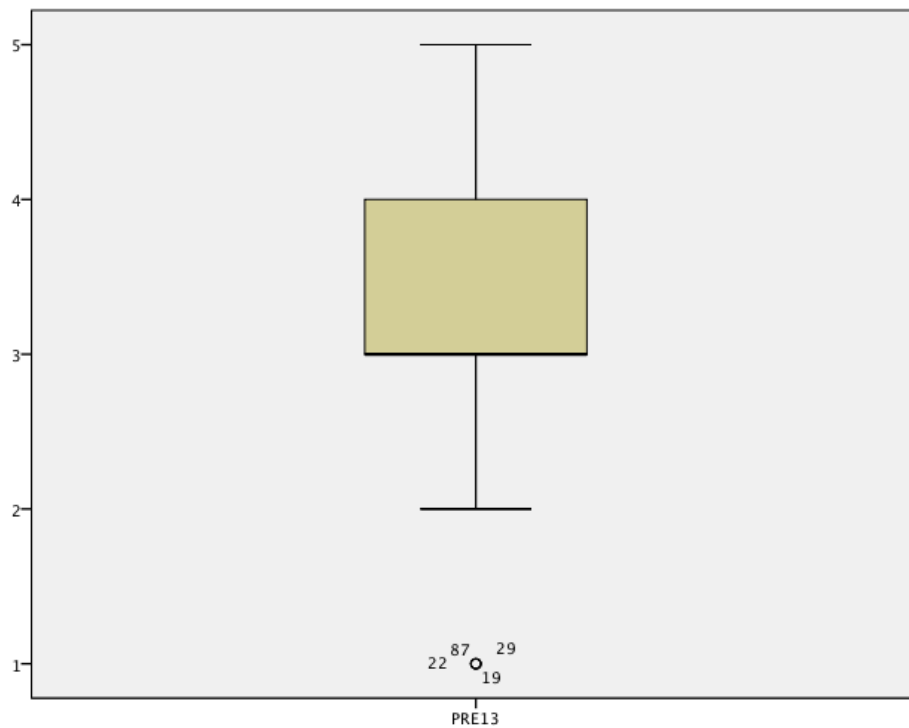
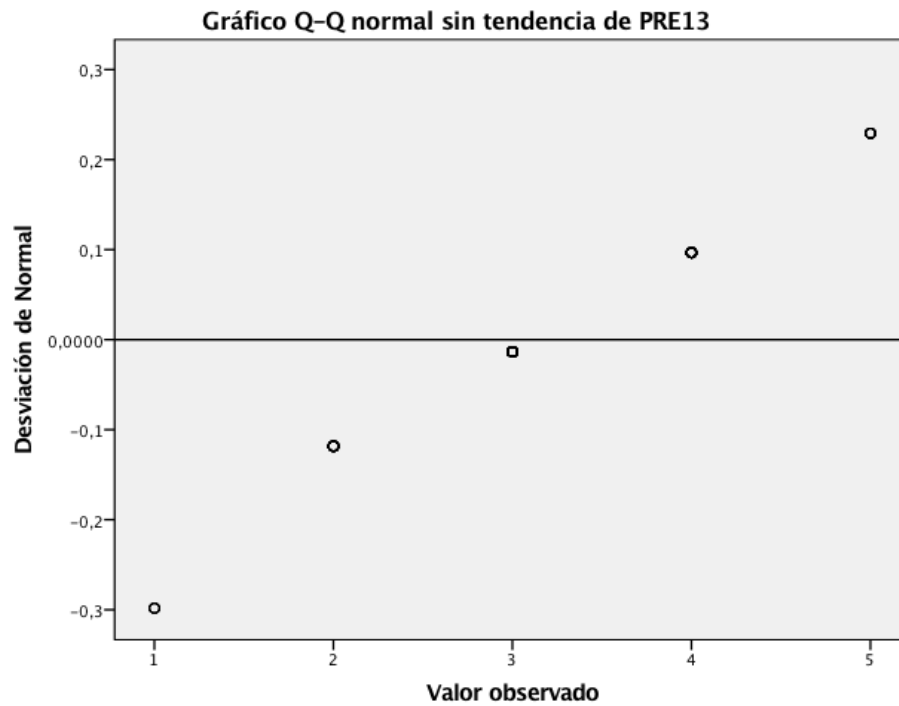
Pruebas de normalidad

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístico	gl	Sig.	Estadístico	gl	Sig.
	o			o		
PRE13	,222	99	,000	,901	99	,000

a. Corrección de significación de Lilliefors

PRE13





```
EXAMINE VARIABLES=POST13
      /PLOT BOXPLOT HISTOGRAM NPLOT
```

```

/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 13	99	99,0%	1	1,0%	100	100,0%

Descriptivos

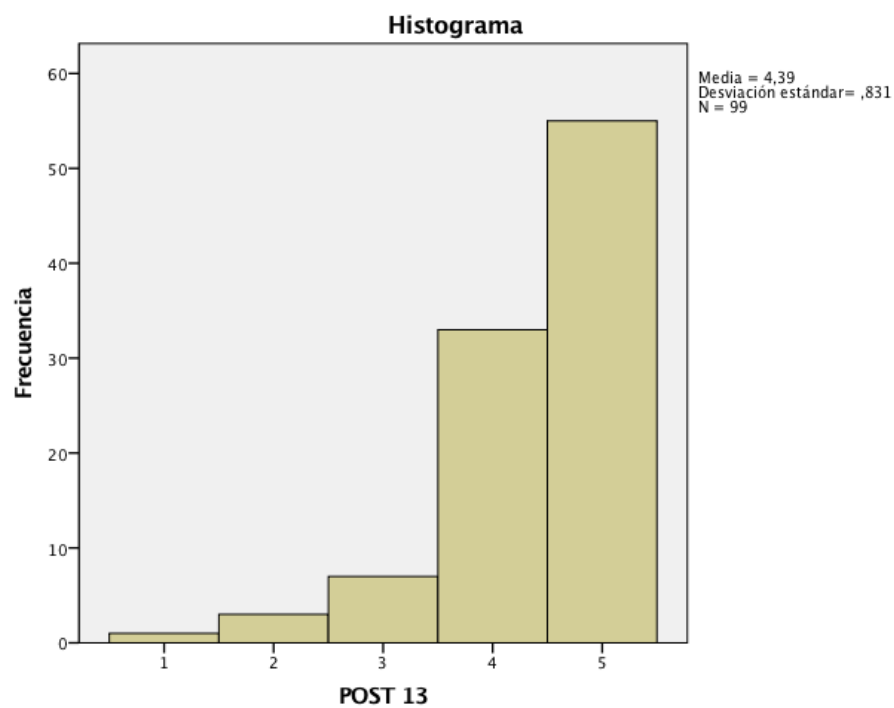
			Estadístico	Error estándar
POST 13	Media		4,39	,083
	95% de intervalo de confianza para la media	Límite inferior	4,23	
		Límite superior	4,56	
	Media recortada al 5%		4,49	
	Mediana		5,00	
	Varianza		,690	
	Desviación estándar		,831	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		-1,616	,243
	Curtosis		2,961	,481

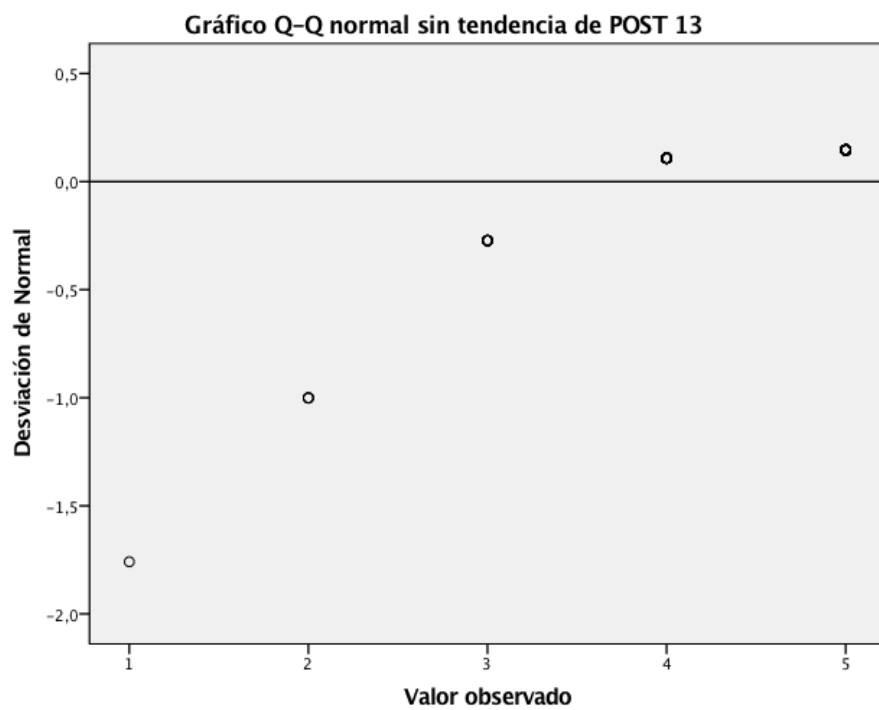
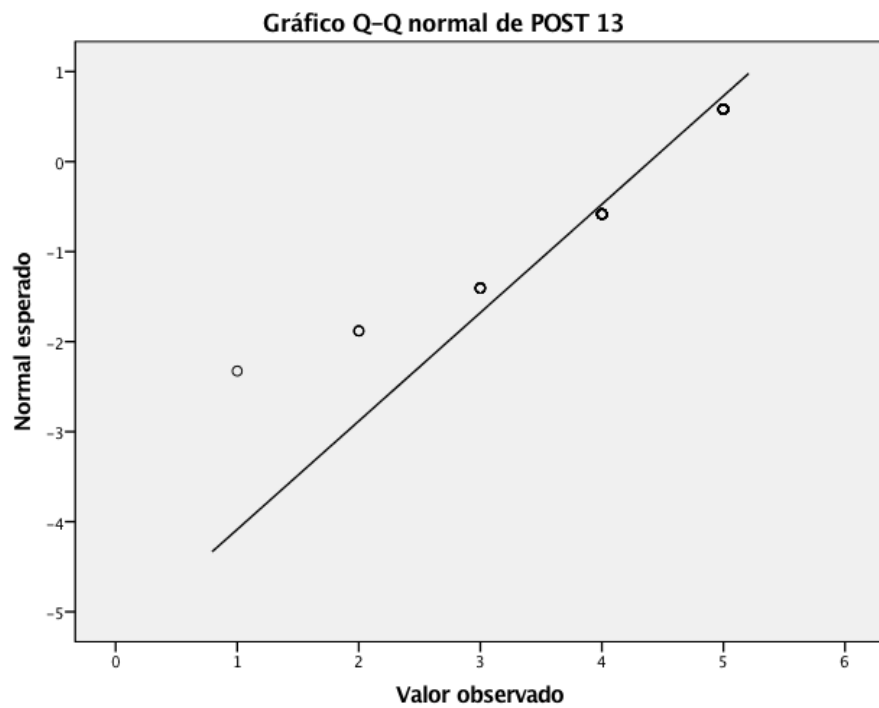
Pruebas de normalidad

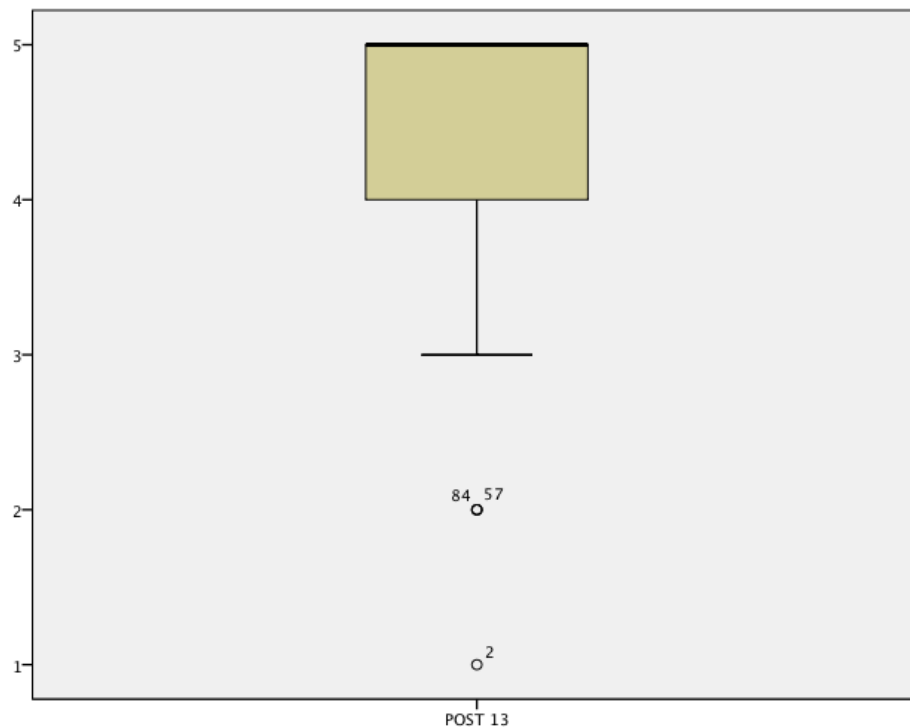
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 13	,323	99	,000	,716	99	,000

a. Corrección de significación de Lilliefors

POST 13







NPAR TESTS

/WILCOXON=PRE13 WITH POST13 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE13	99	3,13	,944	1	5
POST 13	99	4,39	,831	1	5

Prueba de rangos con signo de Wilcoxon

Rangos

	N	Rango promedio	Suma de rangos
--	---	-------------------	-------------------

POST 13 - PRE13	Rangos negativos	3 ^a	36,17	108,50
	Rangos positivos	73 ^b	38,60	2817,50
	Empates	22 ^c		
	Total	98		

a. POST 13 < PRE13

b. POST 13 > PRE13

c. POST 13 = PRE13

Estadísticos de prueba^a

POST 13 -
PRE13

Z	-7,147 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE14
/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE14	99	99,0%	1	1,0%	100	100,0%

Descriptivos

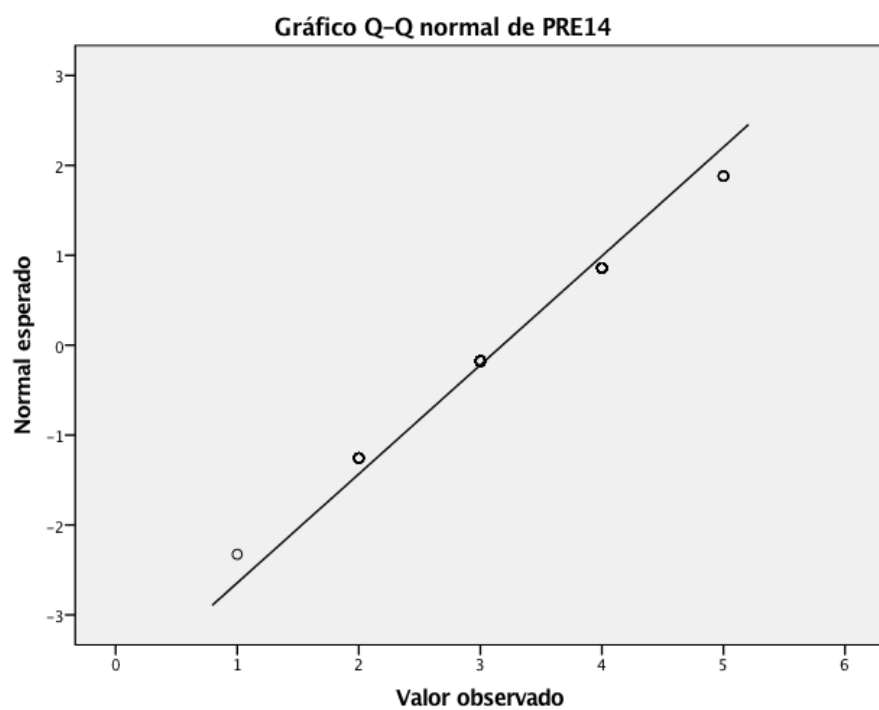
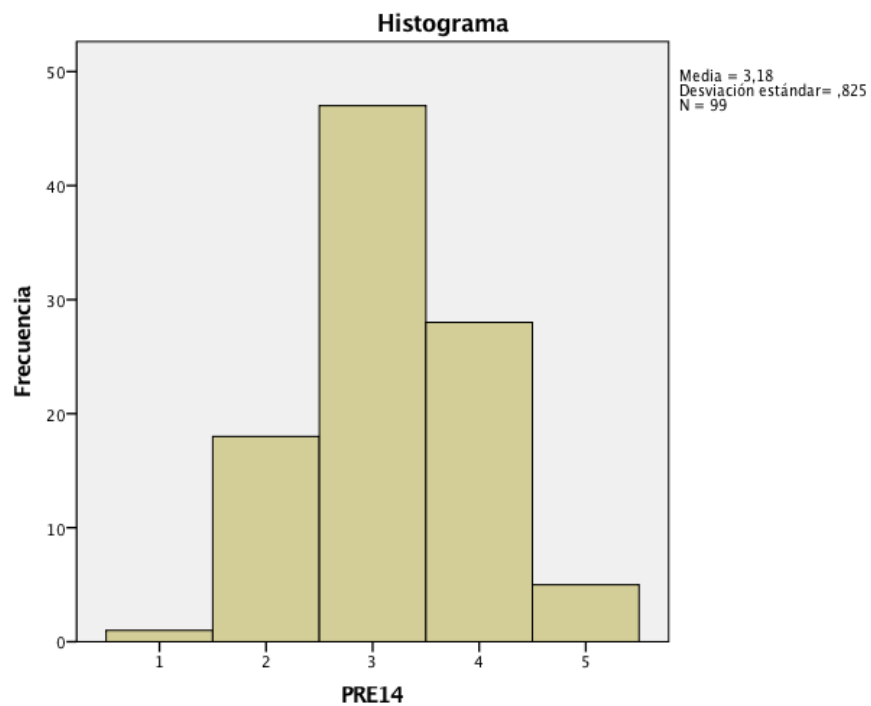
			Estadístico	Error estándar
PRE14	Media		3,18	,083
	95% de intervalo de confianza para la media	Límite inferior	3,02	
		Límite superior	3,35	
	Media recortada al 5%		3,16	
	Mediana		3,00	
	Varianza		,681	
	Desviación estándar		,825	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		,093	,243
	Curtosis		-,169	,481

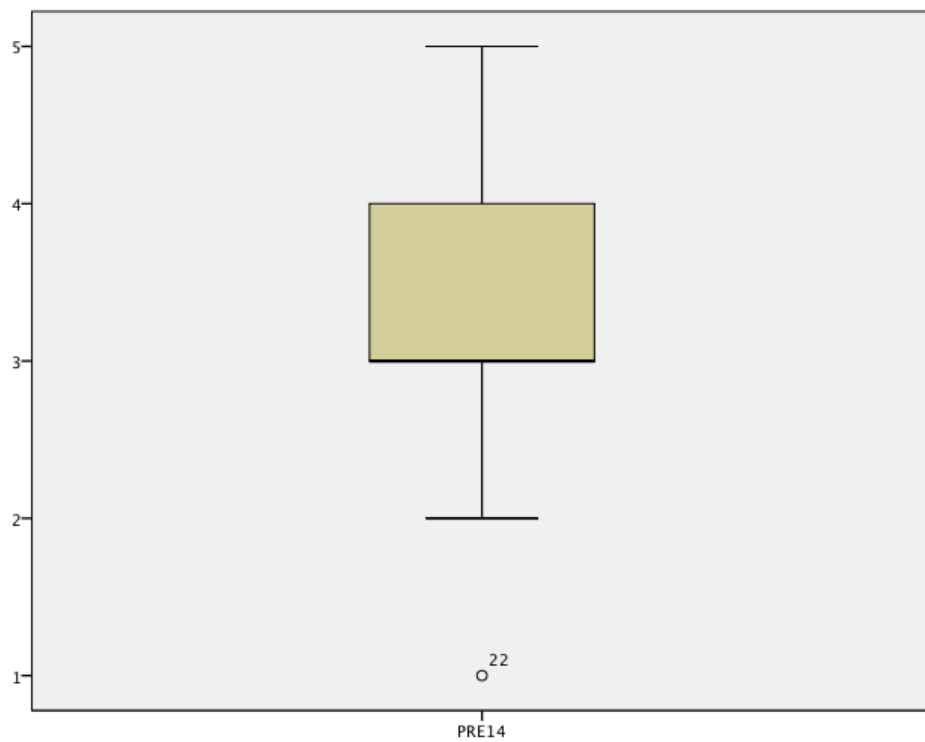
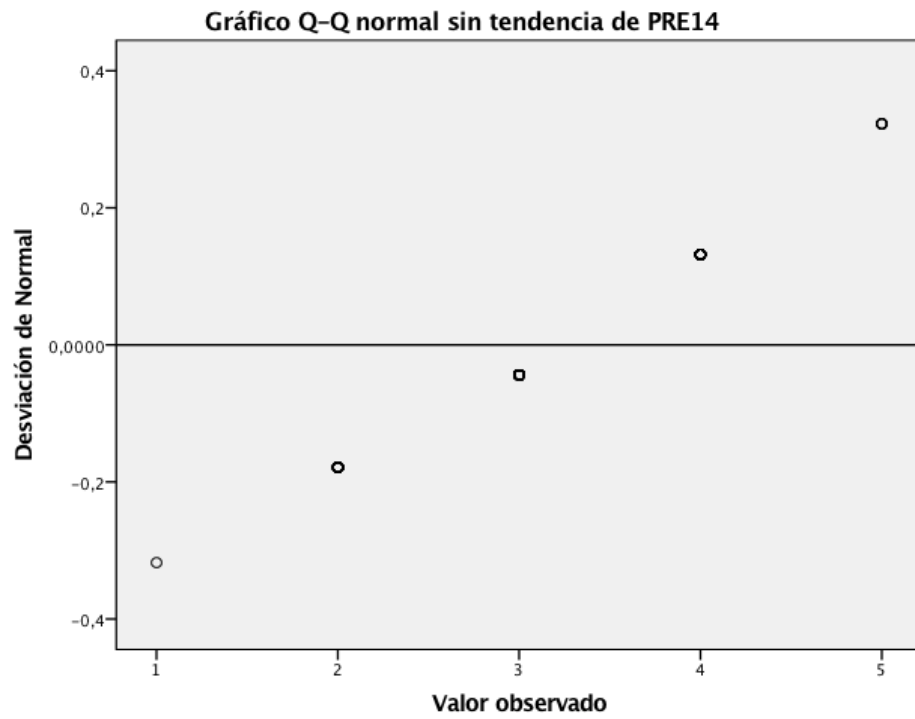
Pruebas de normalidad

Kolmogorov-Smirnov ^a			Shapiro-Wilk			
Estadístic			Estadístic			
o	gl	Sig.	o	gl	Sig.	
PRE14	,254	99	,000	,876	99	,000

a. Corrección de significación de Lilliefors

PRE14





EXAMINE VARIABLES=POST14

```

/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 14	96	96,0%	4	4,0%	100	100,0%

Descriptivos

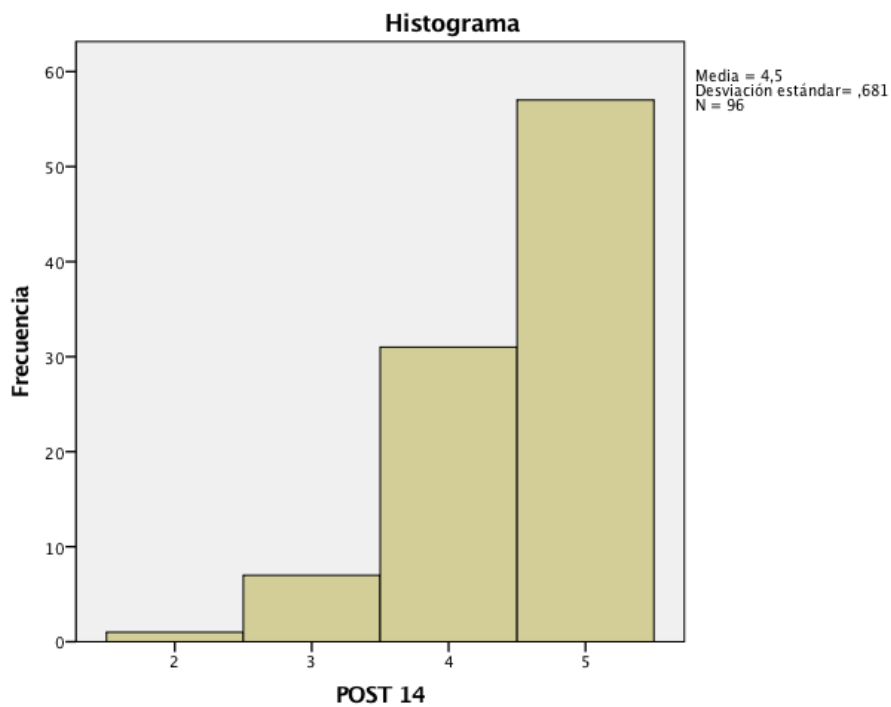
			Estadístico	Error estándar
POST 14	Media		4,50	,069
	95% de intervalo de confianza para la media	Límite inferior	4,36	
		Límite superior	4,64	
	Media recortada al 5%		4,57	
	Mediana		5,00	
	Varianza		,463	
	Desviación estándar		,681	
	Mínimo		2	
	Máximo		5	
	Rango		3	
	Rango intercuartil		1	
	Asimetría		-1,228	,246
	Curtosis		1,084	,488

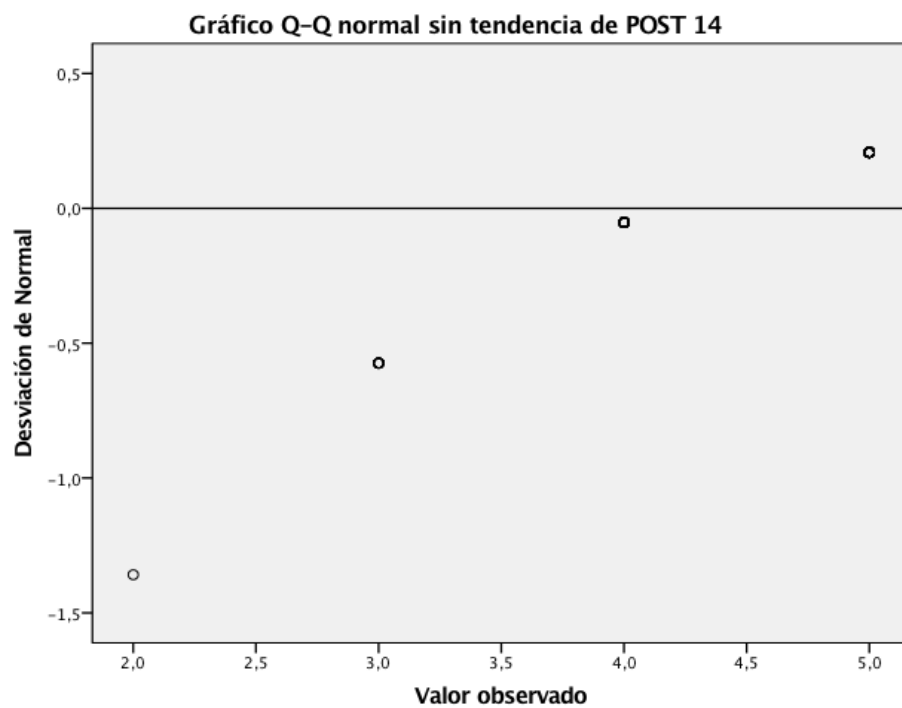
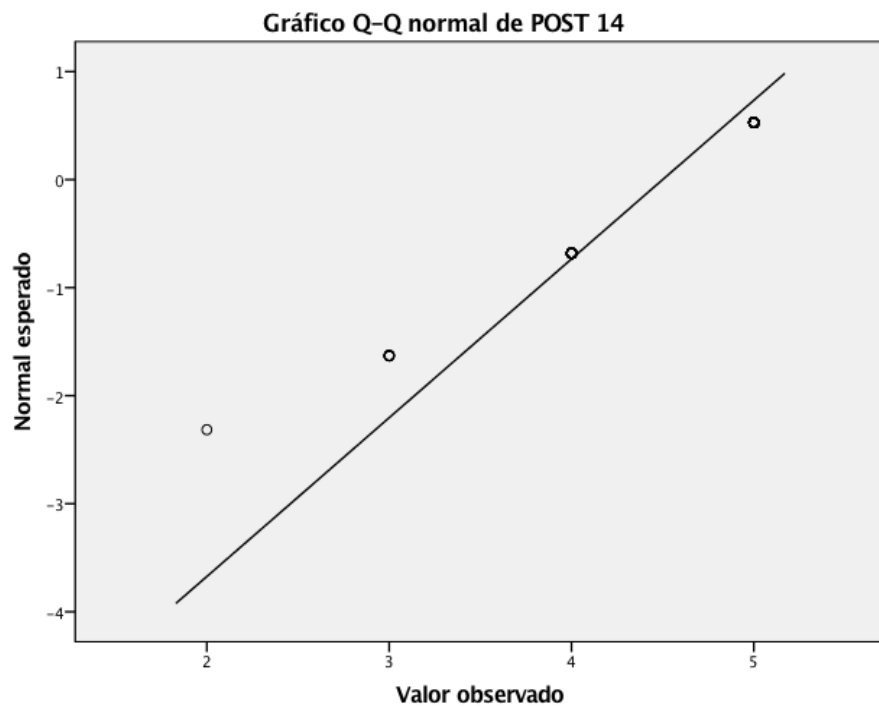
Pruebas de normalidad

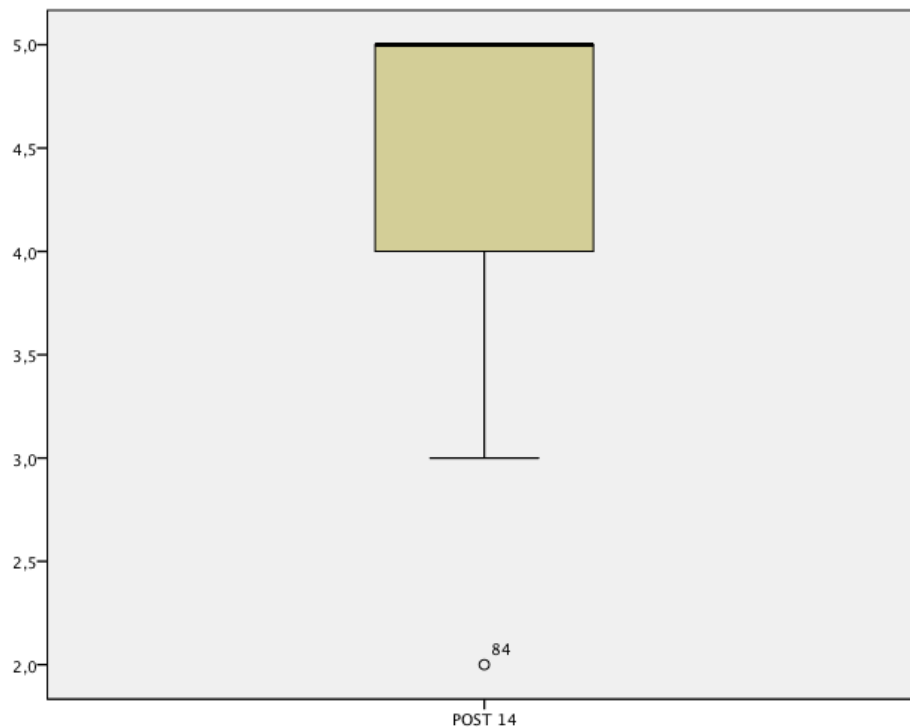
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 14	,362	96	,000	,708	96	,000

a. Corrección de significación de Lilliefors

POST 14







NPAR TESTS

/WILCOXON=PRE14 WITH POST14 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE14	99	3,18	,825	1	5
POST 14	96	4,50	,681	2	5

Prueba de rangos con signo de Wilcoxon

Rangos

		N	Rango promedio	Suma de rangos
POST 14 - PRE14	Rangos negativos	5 ^a	19,00	95,00
	Rangos positivos	76 ^b	42,45	3226,00
	Empates	14 ^c		
	Total	95		

a. POST 14 < PRE14

b. POST 14 > PRE14

c. POST 14 = PRE14

Estadísticos de prueba^a

POST 14 - PRE14	
Z	-7,543 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE15
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

Válido		Casos Perdidos		Total	
N	Porcentaje	N	Porcentaje	N	Porcentaje
	e		e		e

PRE15	99	99,0%	1	1,0%	100	100,0%
-------	----	-------	---	------	-----	--------

Descriptivos

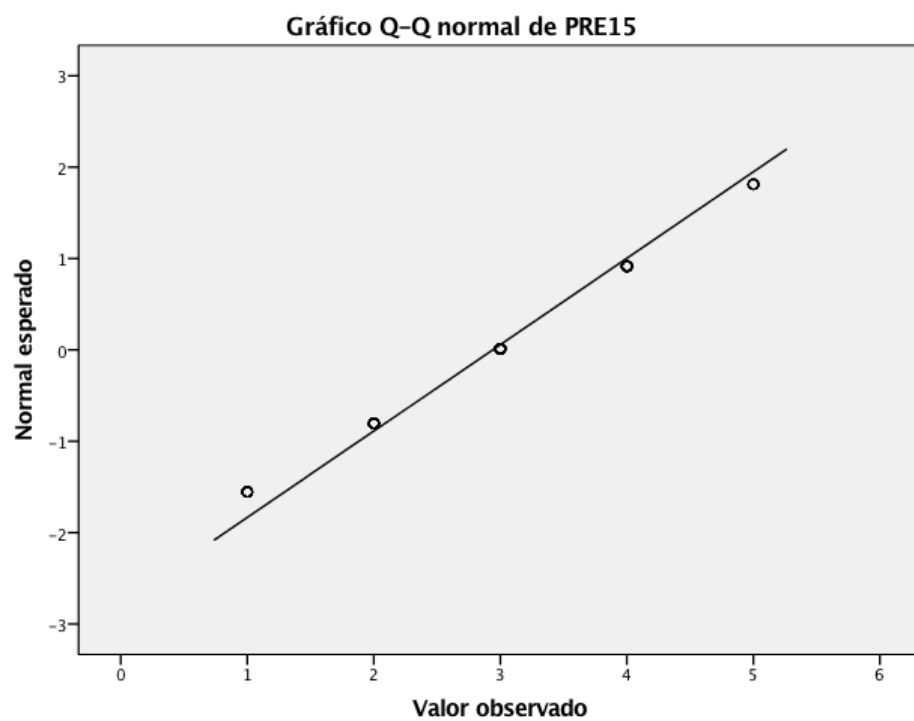
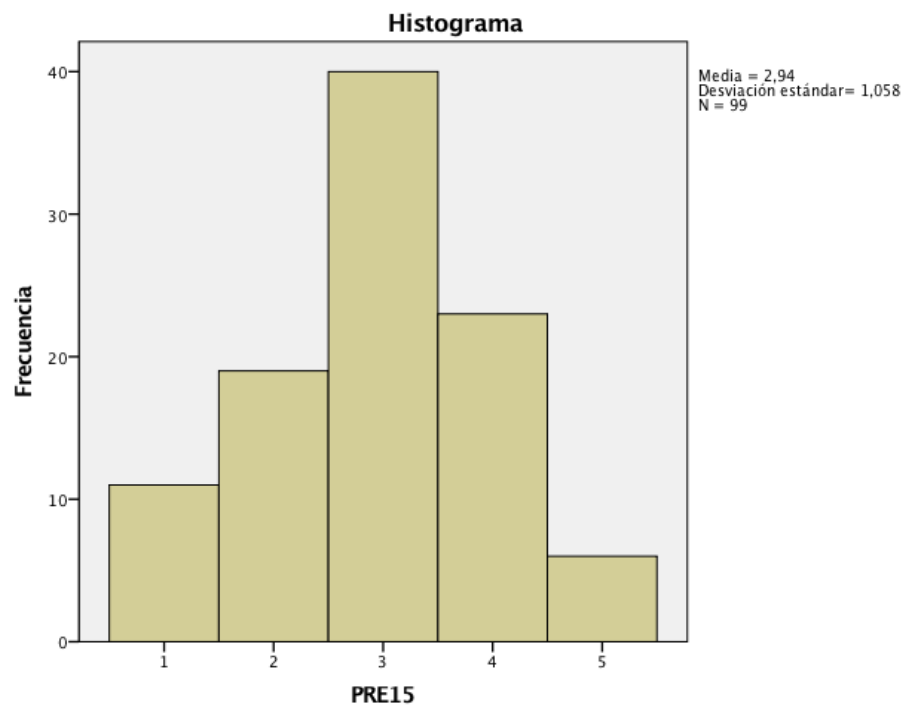
			Estadístico	Error estándar
PRE15	Media		2,94	,106
	95% de intervalo de confianza para la media	Límite inferior	2,73	
		Límite superior	3,15	
	Media recortada al 5%		2,93	
	Mediana		3,00	
	Varianza		1,119	
	Desviación estándar		1,058	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		-,141	,243
	Curtosis		-,427	,481

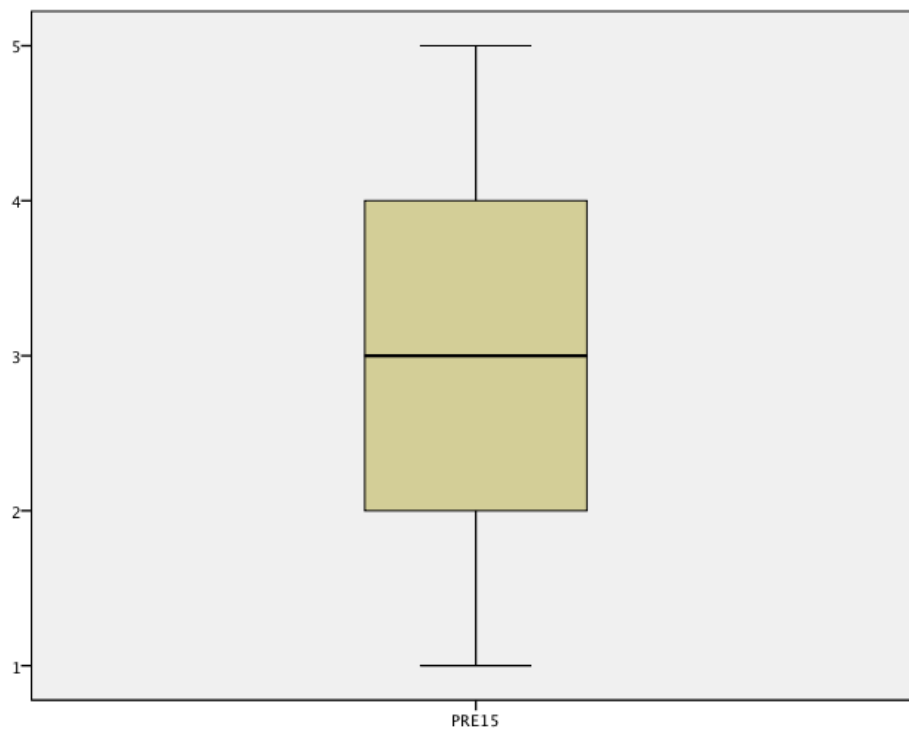
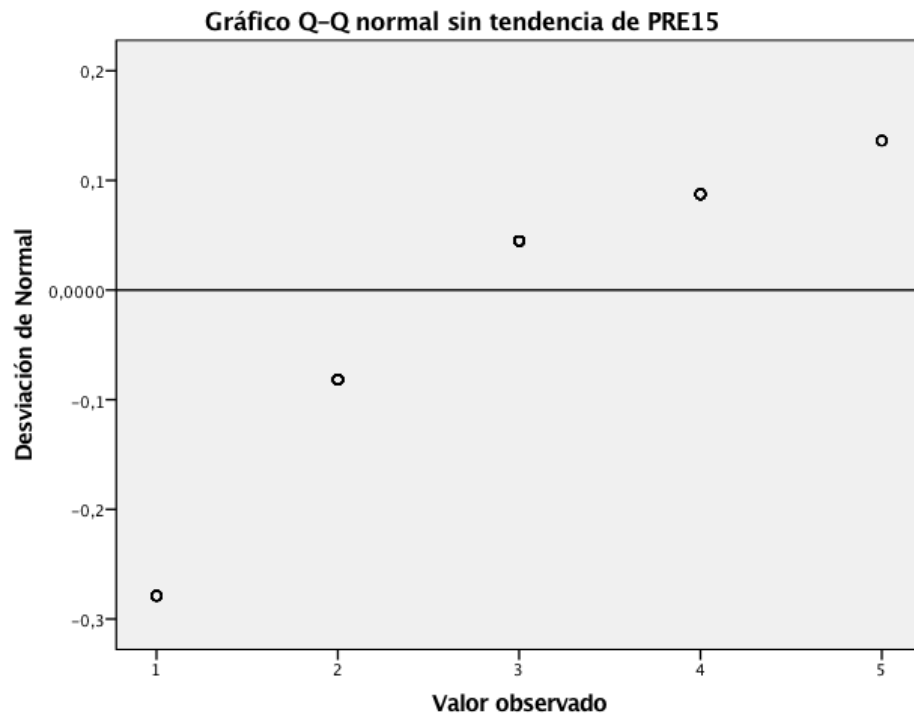
Pruebas de normalidad

Kolmogorov-Smirnov ^a			Shapiro-Wilk			
Estadístic			Estadístic			
o	gl	Sig.	o	gl	Sig.	
PRE15	,220	99	,000	,908	99	,000

a. Corrección de significación de Lilliefors

PRE15





EXAMINE VARIABLES=POST15

```

/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 15	87	87,0%	13	13,0%	100	100,0%

Descriptivos

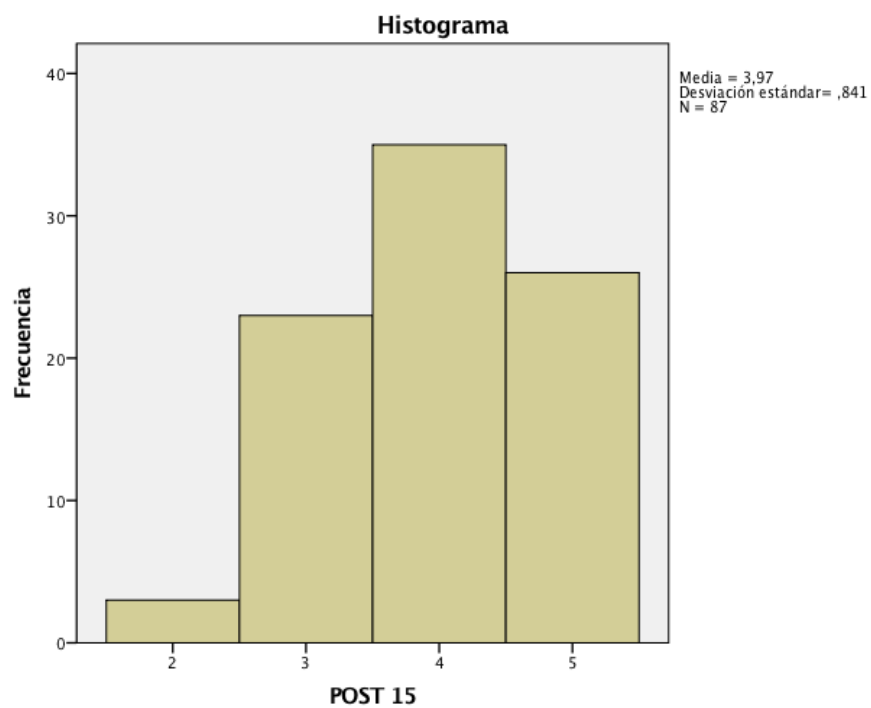
			Estadístico	Error estándar
POST 15	Media		3,97	,090
	95% de intervalo de confianza para la media	Límite inferior	3,79	
		Límite superior	4,14	
	Media recortada al 5%		4,00	
	Mediana		4,00	
	Varianza		,708	
	Desviación estándar		,841	
	Mínimo		2	
	Máximo		5	
	Rango		3	
	Rango intercuartil		2	
	Asimetría		-,294	,258
	Curtosis		-,757	,511

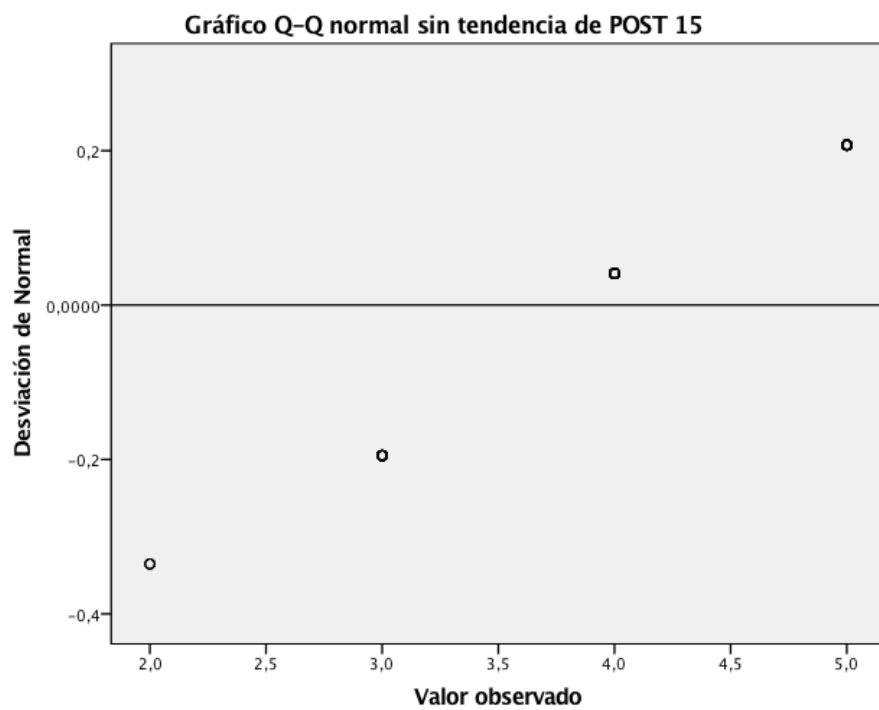
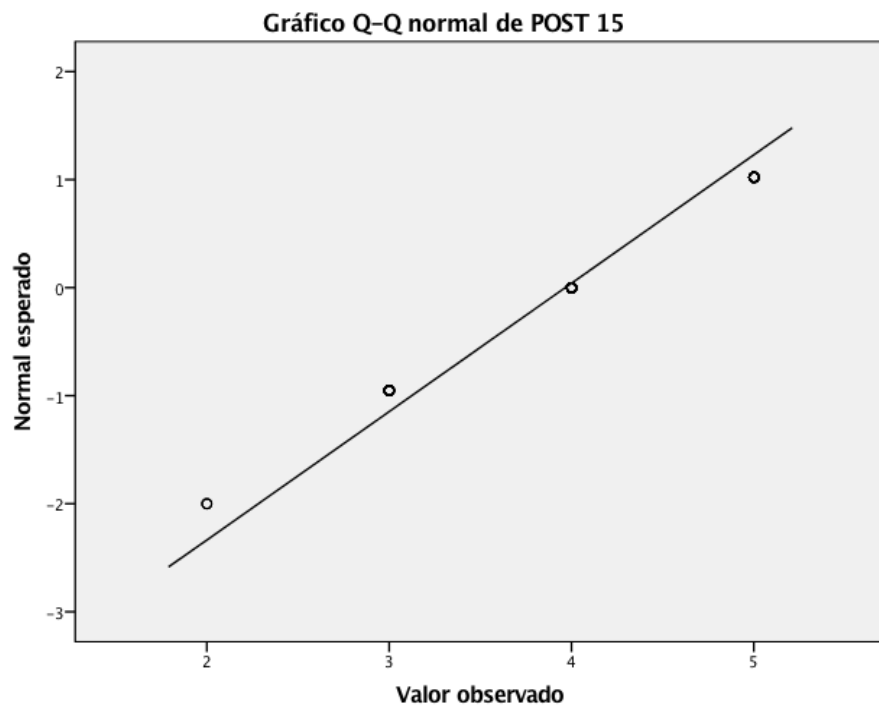
Pruebas de normalidad

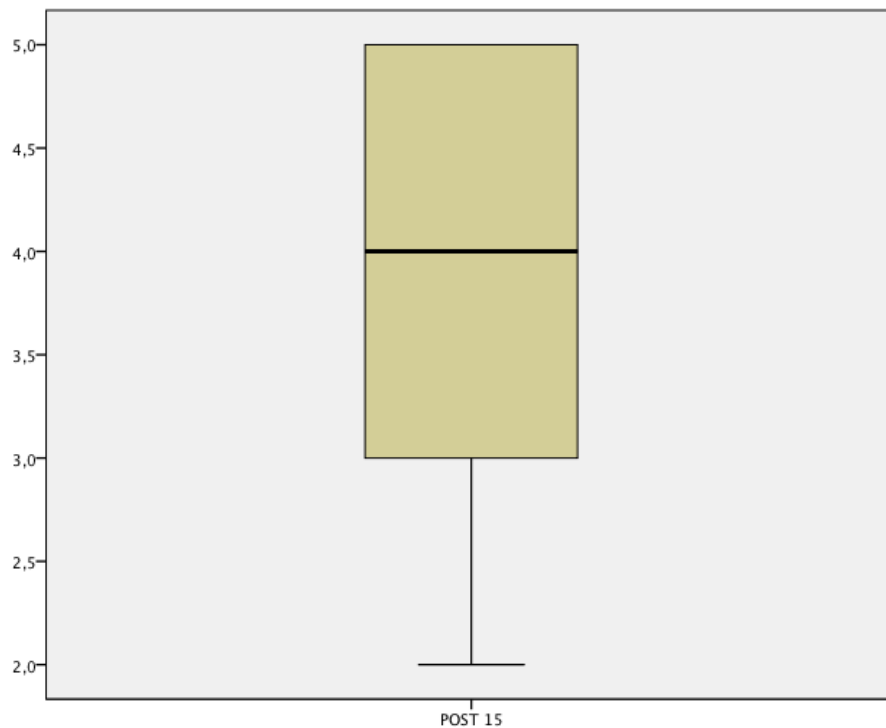
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 15	,217	87	,000	,849	87	,000

a. Corrección de significación de Lilliefors

POST 15







NPAR TESTS

/WILCOXON=PRE15 WITH POST15 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE15	99	2,94	1,058	1	5
POST 15	87	3,97	,841	2	5

Prueba de rangos con signo de Wilcoxon

Rangos

	N	Rango promedio	Suma de rangos
--	---	-------------------	-------------------

POST 15 - PRE15	Rangos negativos	8 ^a	24,88	199,00
	Rangos positivos	57 ^b	34,14	1946,00
	Empates	21 ^c		
	Total	86		

a. POST 15 < PRE15

b. POST 15 > PRE15

c. POST 15 = PRE15

Estadísticos de prueba^a

	POST 15 - PRE15
Z	-5,843 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE16
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE16	100	100,0%	0	0,0%	100	100,0%

Descriptivos

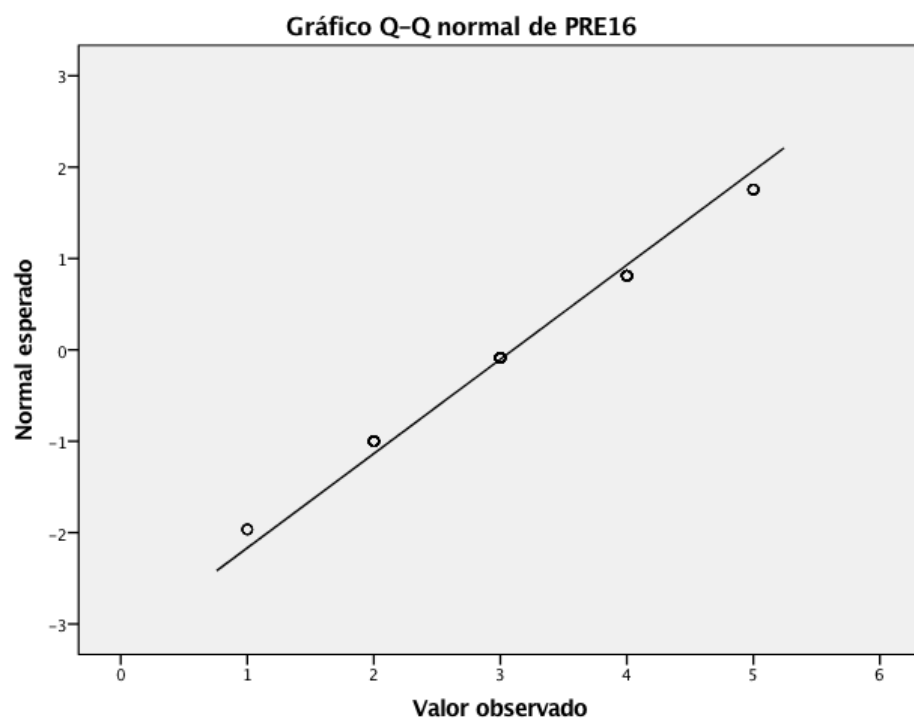
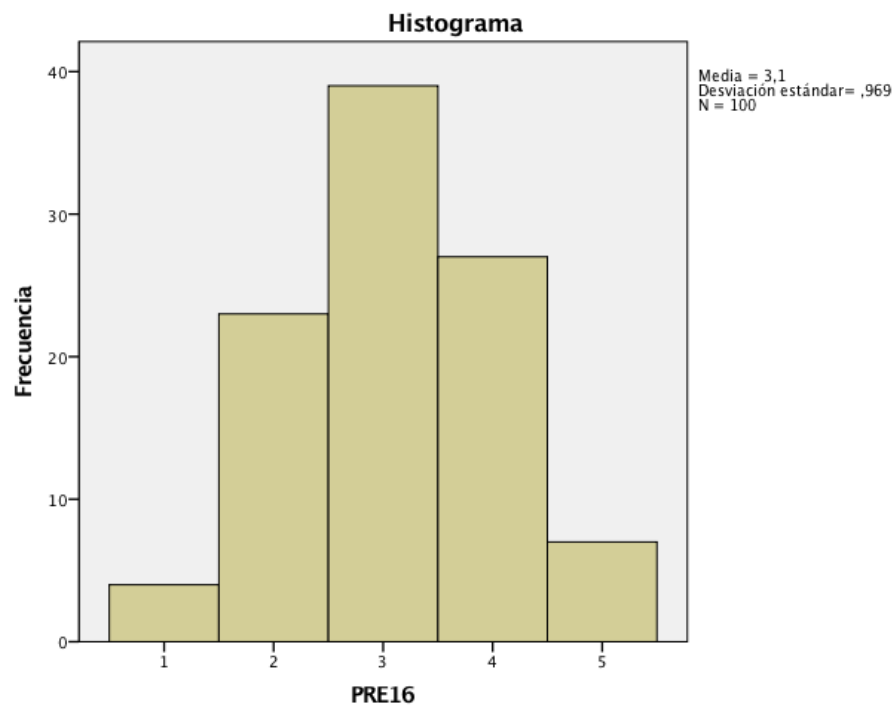
			Estadístico	Error estándar
PRE16	Media		3,10	,097
	95% de intervalo de confianza para la media	Límite inferior	2,91	
		Límite superior	3,29	
	Media recortada al 5%		3,10	
	Mediana		3,00	
	Varianza		,939	
	Desviación estándar		,969	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		,000	,241
	Curtosis		-,413	,478

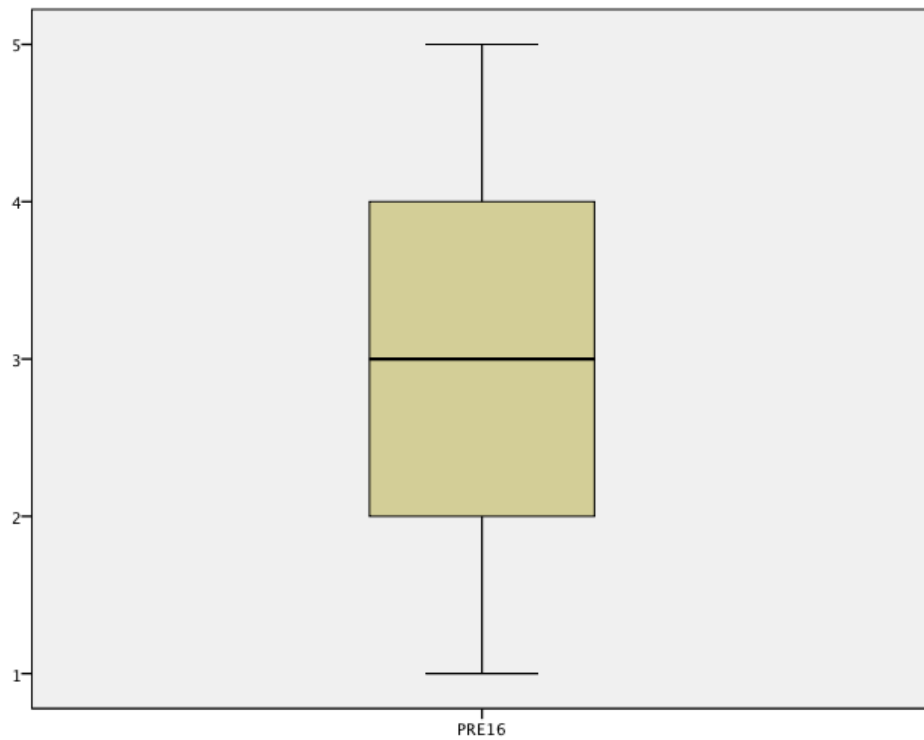
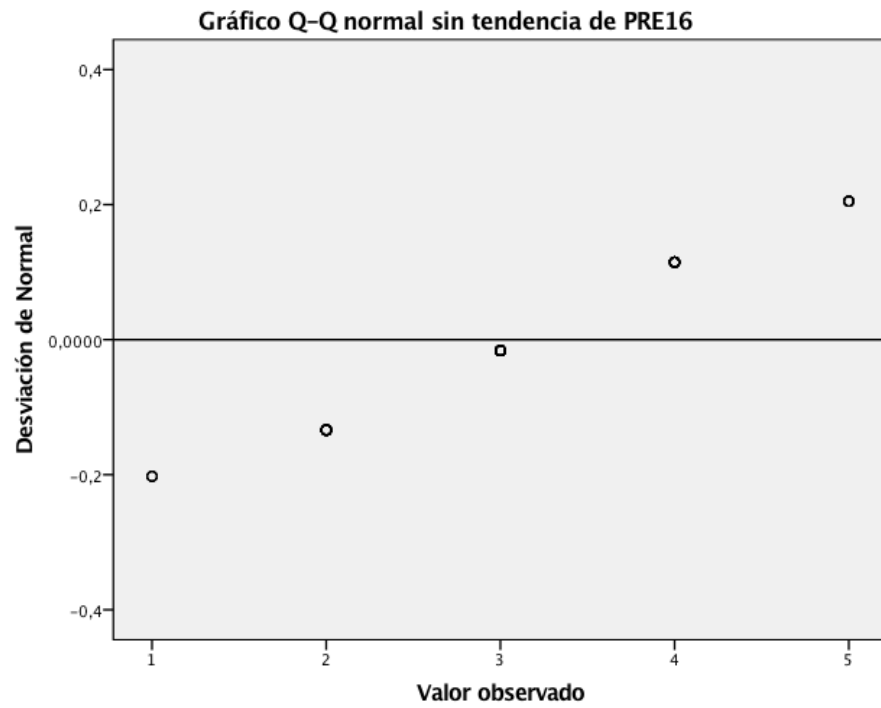
Pruebas de normalidad

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístico	gl	Sig.	Estadístico	gl	Sig.
	o			o		
PRE16	,201	100	,000	,906	100	,000

a. Corrección de significación de Lilliefors

PRE16





EXAMINE VARIABLES=POST16

```

/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 16	95	95,0%	5	5,0%	100	100,0%

Descriptivos

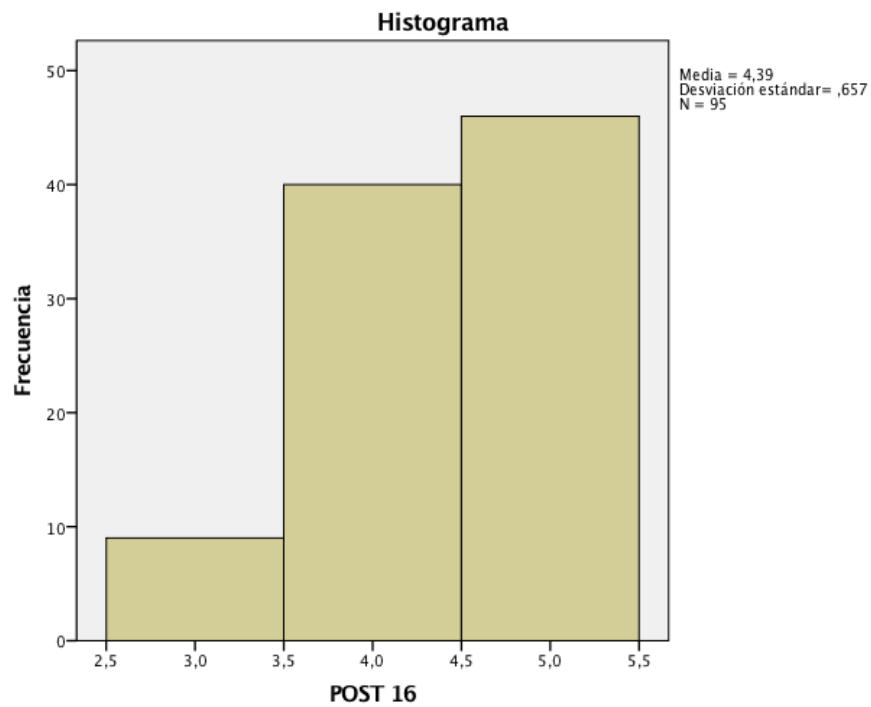
			Estadístico	Error estándar
POST 16	Media		4,39	,067
	95% de intervalo de confianza para la media	Límite inferior	4,26	
		Límite superior	4,52	
	Media recortada al 5%		4,43	
	Mediana		4,00	
	Varianza		,432	
	Desviación estándar		,657	
	Mínimo		3	
	Máximo		5	
	Rango		2	
	Rango intercuartil		1	
	Asimetría		-,614	,247
	Curtosis		-,613	,490

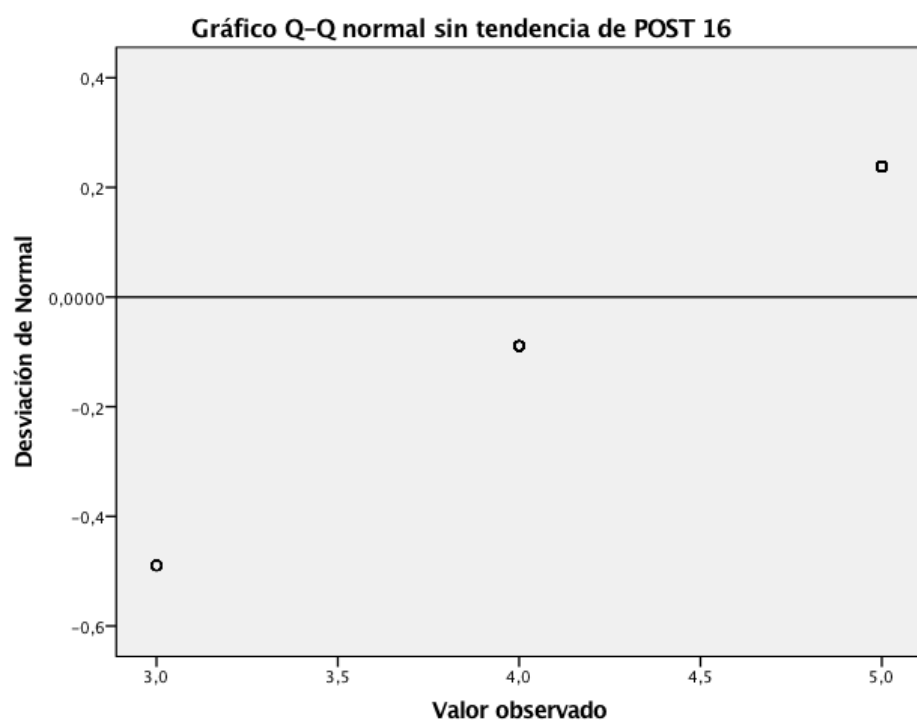
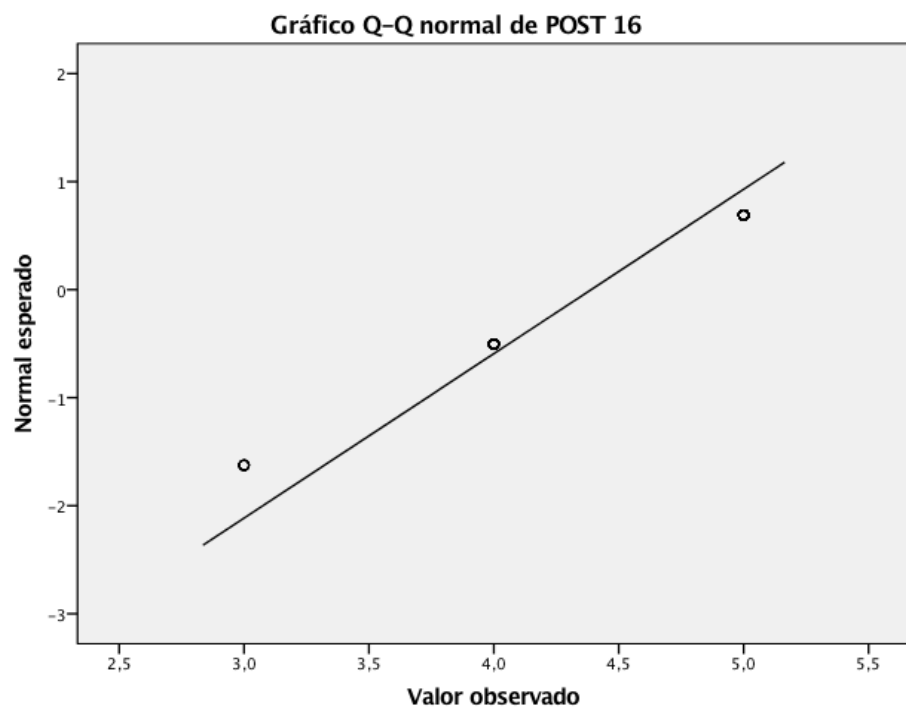
Pruebas de normalidad

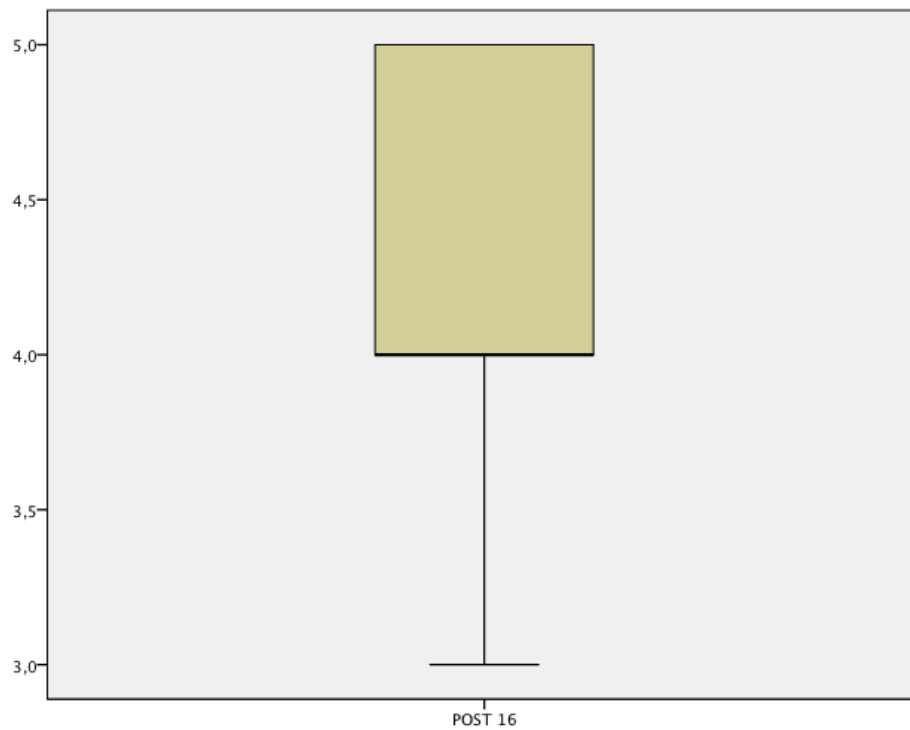
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 16	,308	95	,000	,753	95	,000

a. Corrección de significación de Lilliefors

POST 16







NPAR TESTS

/WILCOXON=PRE16 WITH POST16 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE16	100	3,10	,969	1	5
POST 16	95	4,39	,657	3	5

Prueba de rangos con signo de Wilcoxon

		Rangos		
		N	Rango promedio	Suma de rangos
POST 16 - PRE16	Rangos negativos	2 ^a	17,50	35,00
	Rangos positivos	71 ^b	37,55	2666,00
	Empates	22 ^c		
	Total	95		

a. POST 16 < PRE16

b. POST 16 > PRE16

c. POST 16 = PRE16

Estadísticos de prueba^a

POST 16 - PRE16	
Z	-7,364 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE17
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE17	99	99,0%	1	1,0%	100	100,0%

Descriptivos

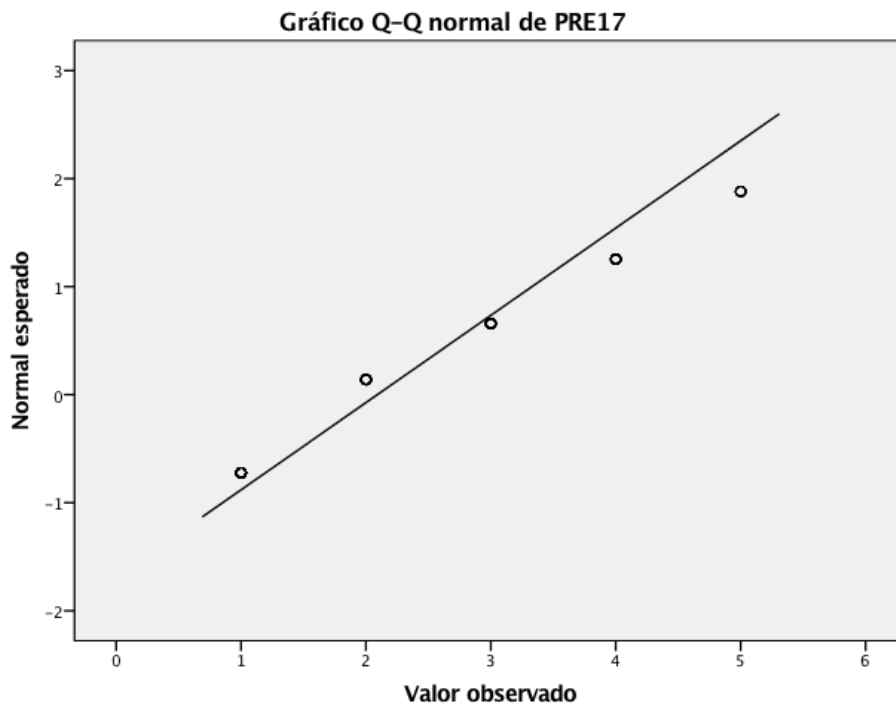
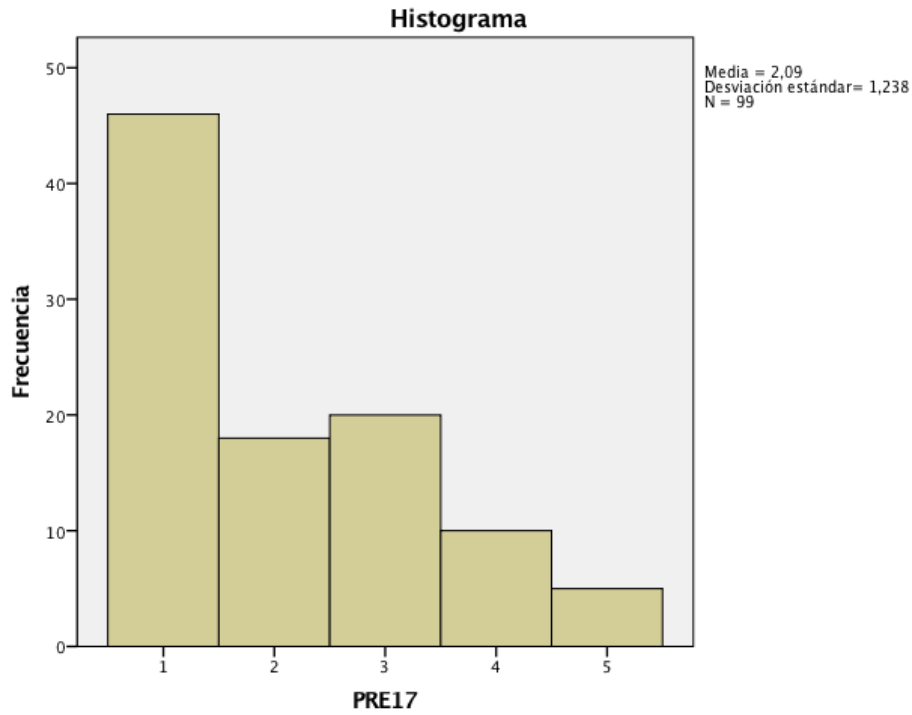
			Estadístico	Error estándar
PRE17	Media		2,09	,124
	95% de intervalo de confianza para la media	Límite inferior	1,84	
		Límite superior	2,34	
	Media recortada al 5%		1,99	
	Mediana		2,00	
	Varianza		1,532	
	Desviación estándar		1,238	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		,812	,243
	Curtosis		-,462	,481

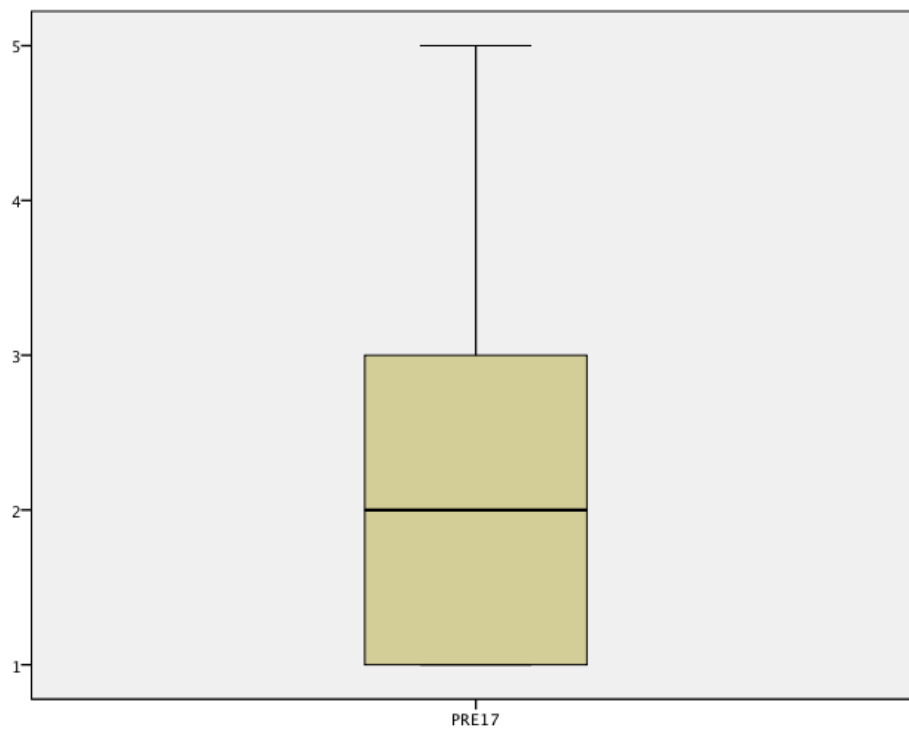
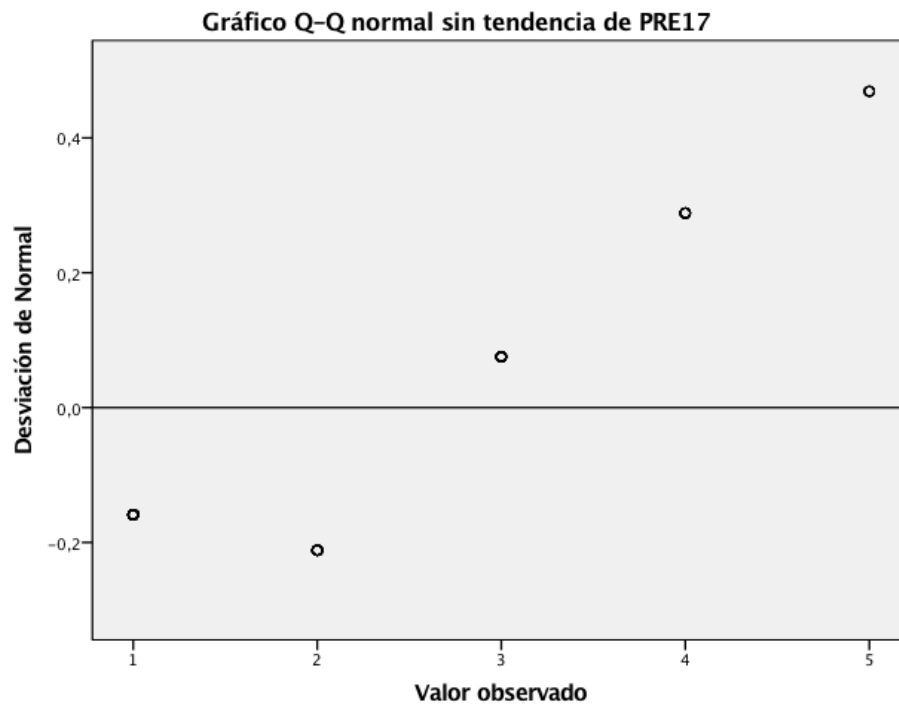
Pruebas de normalidad

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístico	gl	Sig.	Estadístico	gl	Sig.
PRE17	,276	99	,000	,809	99	,000

a. Corrección de significación de Lilliefors

PRE17





```

EXAMINE VARIABLES=POST17
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 17	70	70,0%	30	30,0%	100	100,0%

Descriptivos

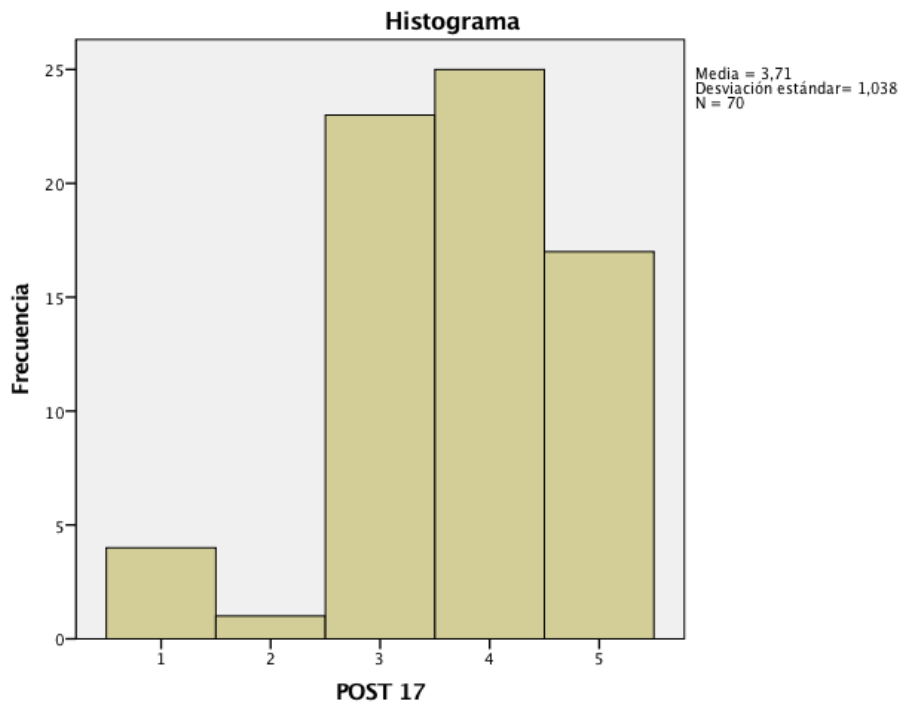
			Estadístico	Error estándar
POST 17	Media		3,71	,124
	95% de intervalo de confianza para la media	Límite inferior	3,47	
		Límite superior	3,96	
	Media recortada al 5%		3,79	
	Mediana		4,00	
	Varianza		1,077	
	Desviación estándar		1,038	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		-,757	,287
	Curtosis		,662	,566

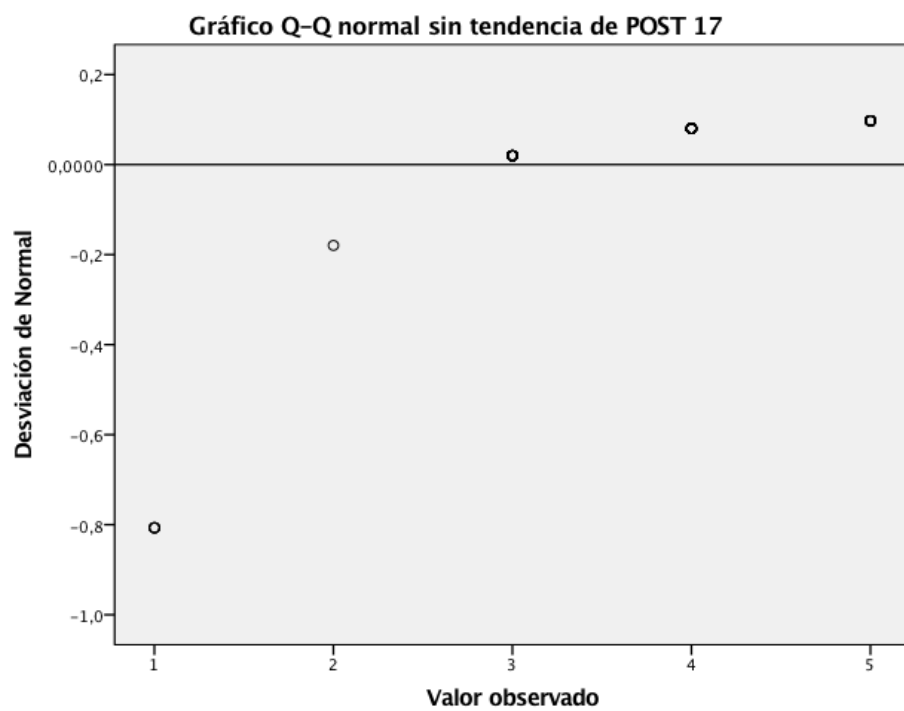
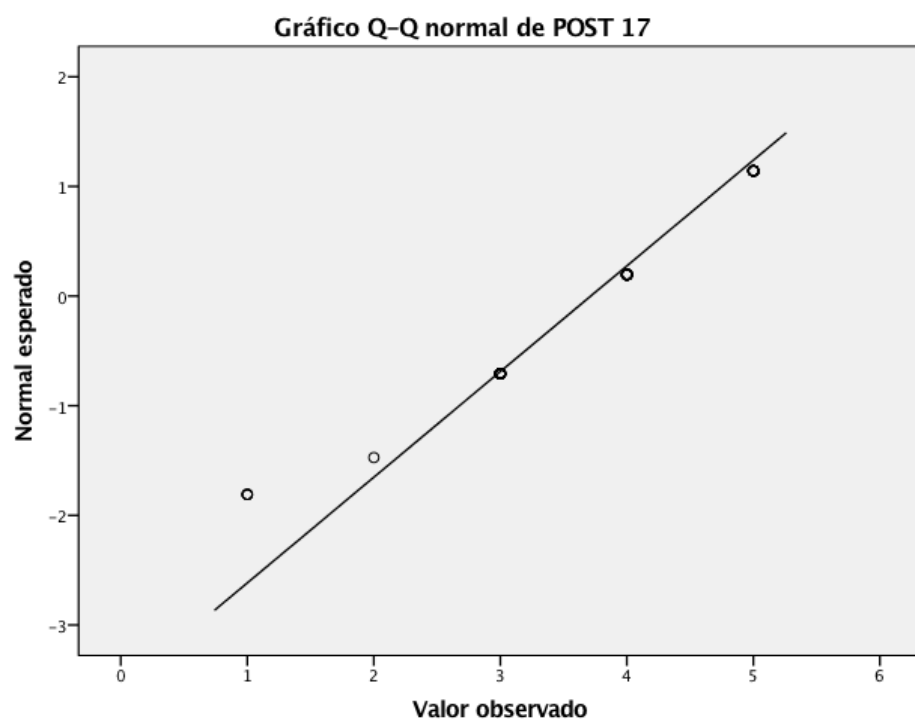
Pruebas de normalidad

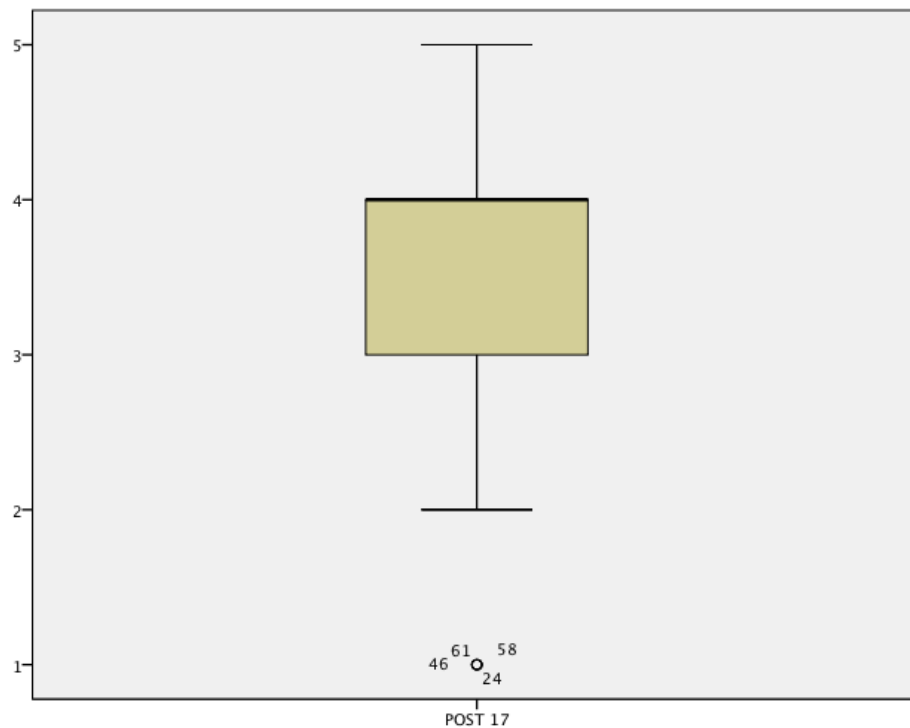
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic o	gl	Sig.	Estadístic o	gl	Sig.
POST 17	,208	70	,000	,852	70	,000

a. Corrección de significación de Lilliefors

POST 17







NPAR TESTS

/WILCOXON=PRE17 WITH POST17 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE17	99	2,09	1,238	1	5
POST 17	70	3,71	1,038	1	5

Prueba de rangos con signo de Wilcoxon

Rangos

	N	Rango promedio	Suma de rangos
--	---	-------------------	-------------------

POST 17 - PRE17	Rangos negativos	9 ^a	17,00	153,00
	Rangos positivos	55 ^b	35,04	1927,00
	Empates	5 ^c		
	Total	69		

a. POST 17 < PRE17

b. POST 17 > PRE17

c. POST 17 = PRE17

Estadísticos de prueba^a

POST 17 -
PRE17

Z	-5,994 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE18
/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE18	100	100,0%	0	0,0%	100	100,0%

Descriptivos

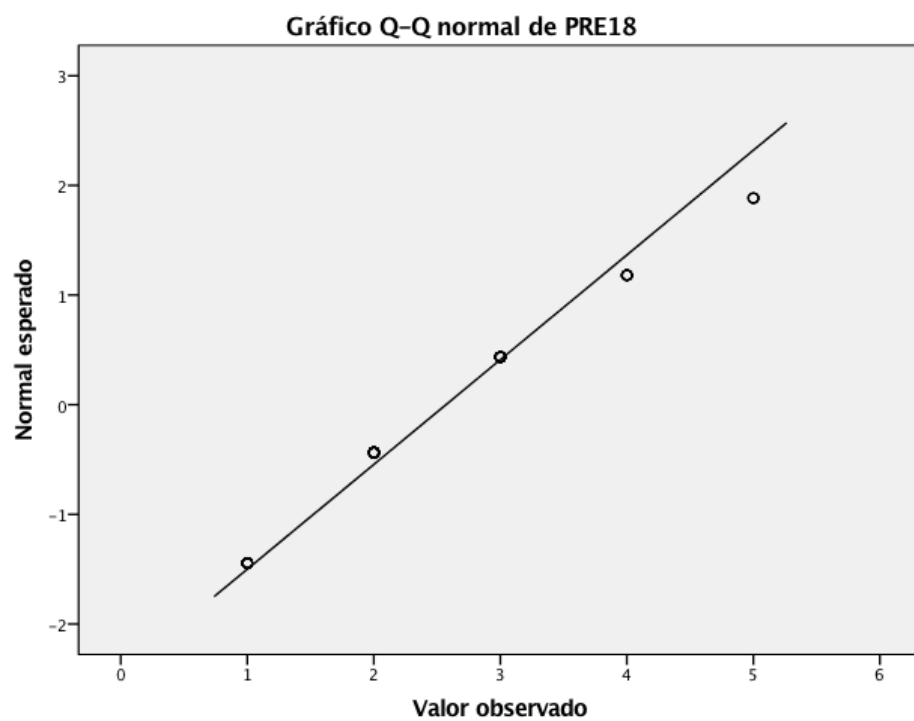
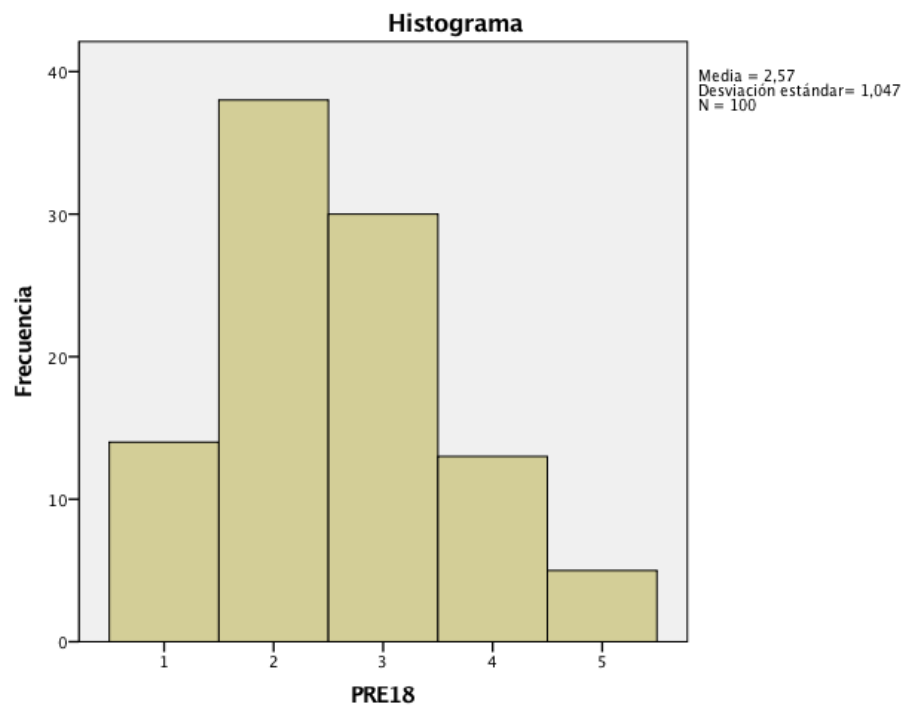
			Estadístico	Error estándar
PRE18	Media		2,57	,105
	95% de intervalo de confianza para la media	Límite inferior	2,36	
		Límite superior	2,78	
	Media recortada al 5%		2,52	
	Mediana		2,00	
	Varianza		1,096	
	Desviación estándar		1,047	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		,457	,241
	Curtosis		-,245	,478

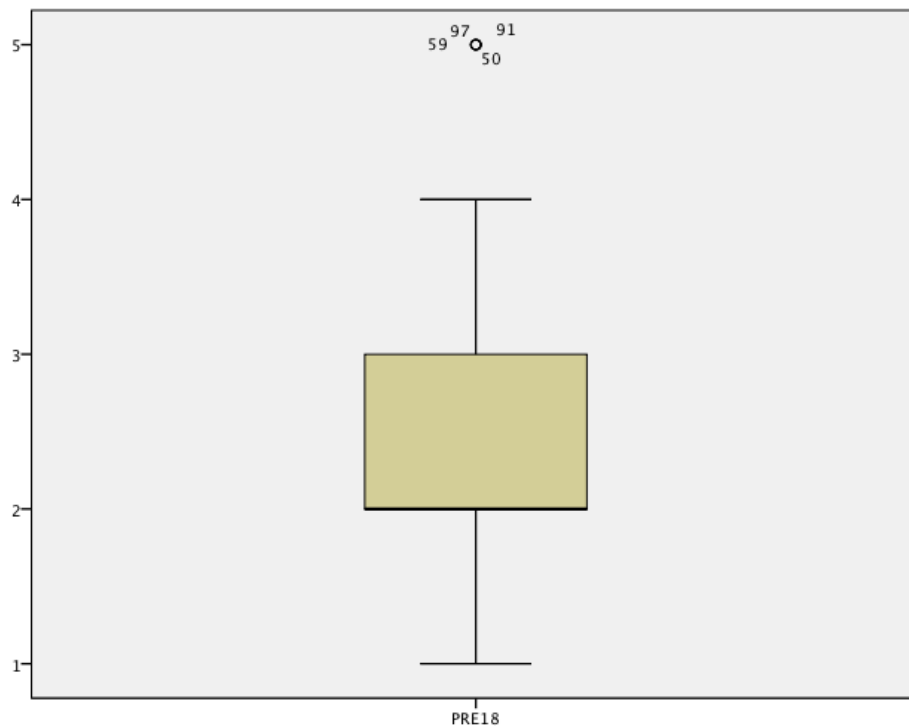
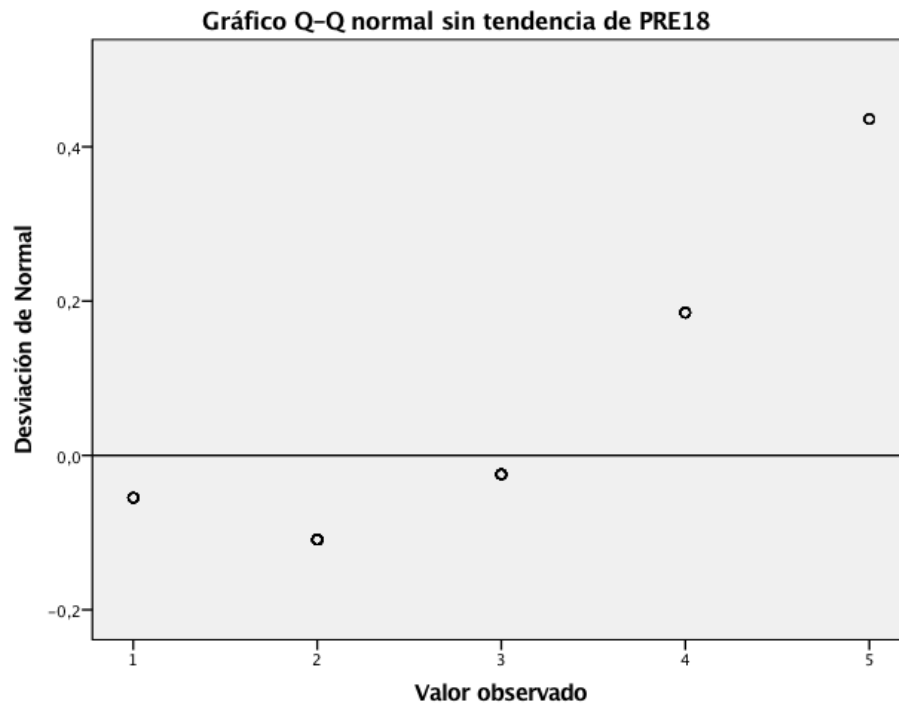
Pruebas de normalidad

Kolmogorov-Smirnov ^a			Shapiro-Wilk		
Estadístic			Estadístic		
o	gl	Sig.	o	gl	Sig.
PRE18	,227	100	,897	100	,000

a. Corrección de significación de Lilliefors

PRE18





```
EXAMINE VARIABLES=POST18  
/PLOT BOXPLOT HISTOGRAM NPLOT
```

```

/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 18	88	88,0%	12	12,0%	100	100,0%

Descriptivos

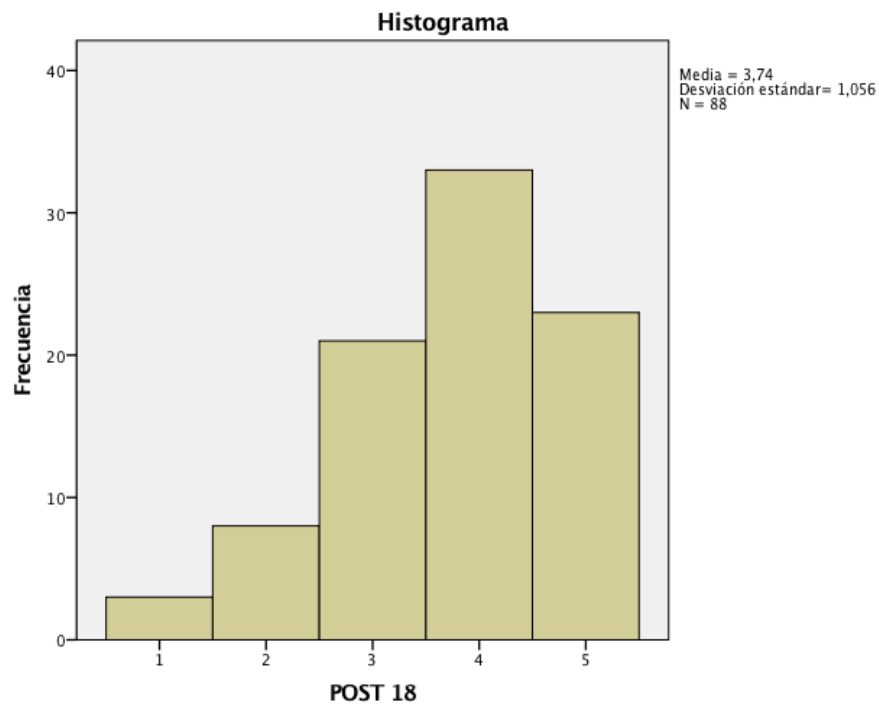
			Estadístico	Error estándar
POST 18	Media		3,74	,113
	95% de intervalo de confianza para la media	Límite inferior	3,51	
		Límite superior	3,96	
	Media recortada al 5%		3,80	
	Mediana		4,00	
	Varianza		1,115	
	Desviación estándar		1,056	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		-,653	,257
	Curtosis		-,069	,508

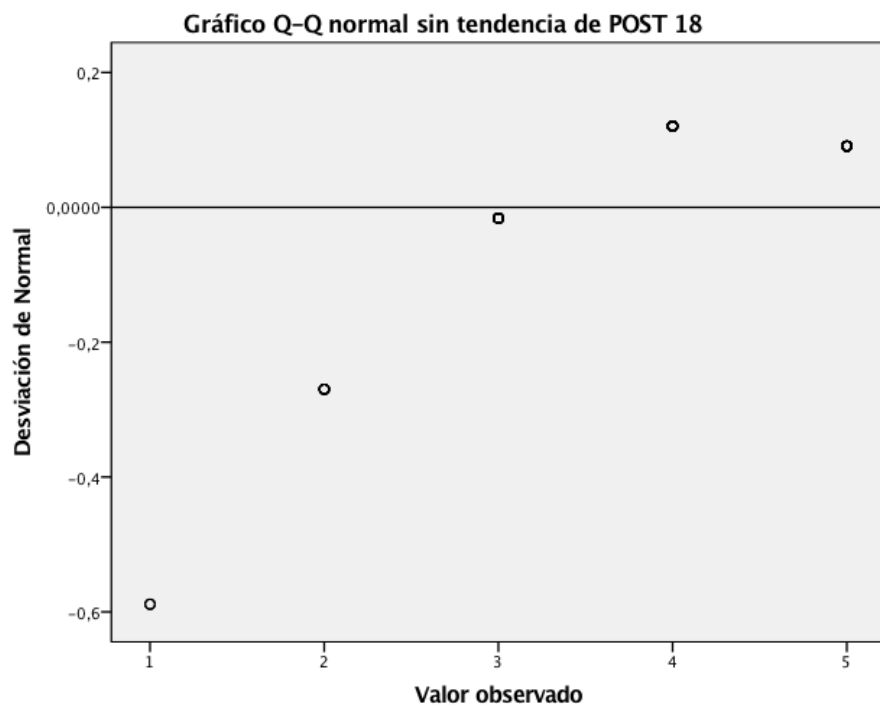
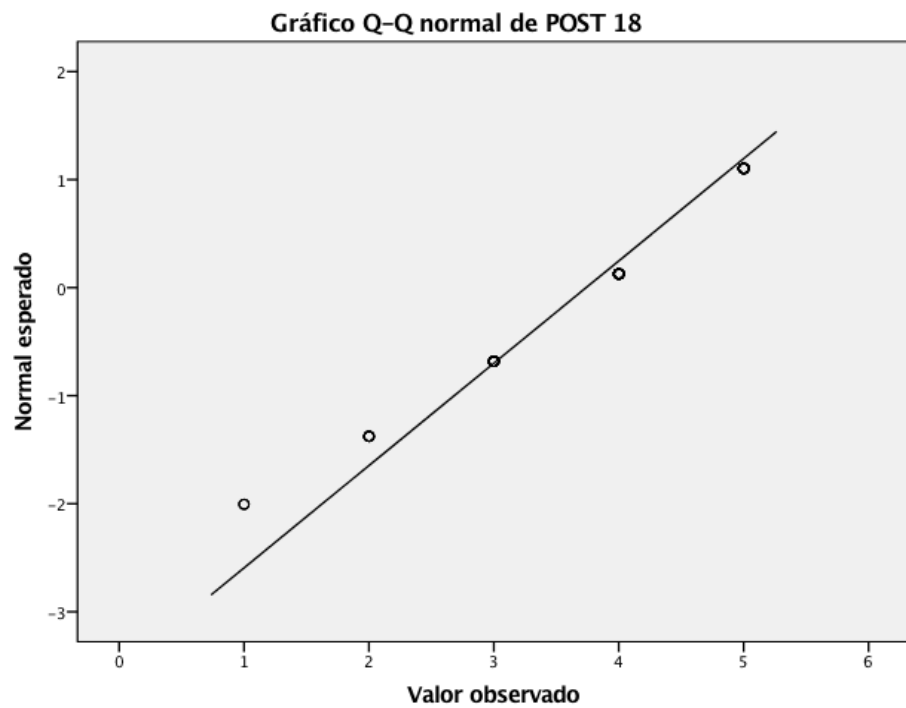
Pruebas de normalidad

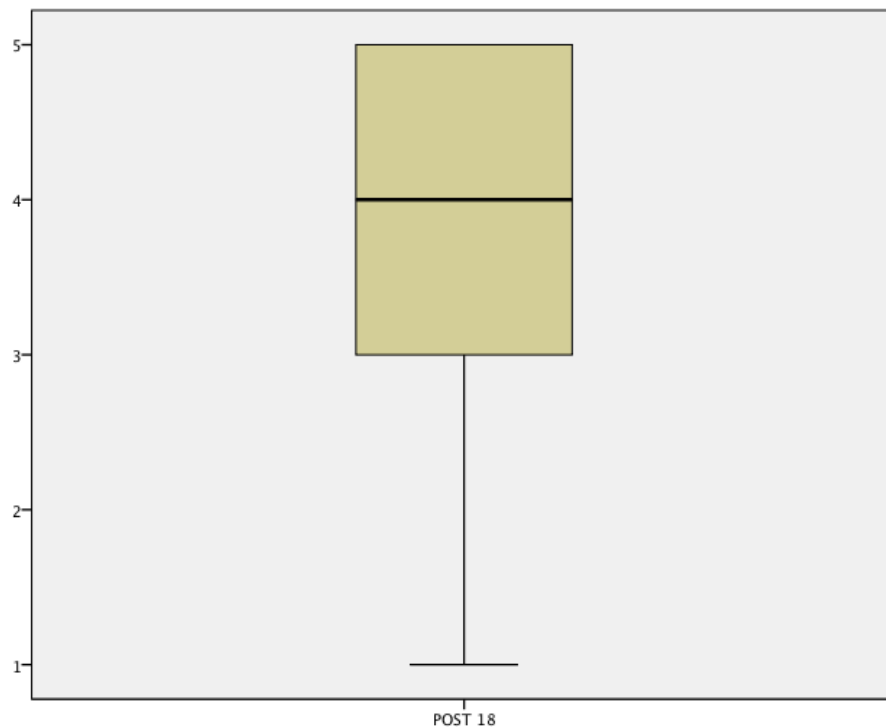
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 18	,234	88	,000	,876	88	,000

a. Corrección de significación de Lilliefors

POST 18







NPAR TESTS

/WILCOXON=PRE18 WITH POST18 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE18	100	2,57	1,047	1	5
POST 18	88	3,74	1,056	1	5

Prueba de rangos con signo de Wilcoxon

Rangos

	N	Rango promedio	Suma de rangos
--	---	-------------------	-------------------

POST 18 - PRE18	Rangos negativos	8 ^a	32,25	258,00
	Rangos positivos	65 ^b	37,58	2443,00
	Empates	15 ^c		
	Total	88		

a. POST 18 < PRE18

b. POST 18 > PRE18

c. POST 18 = PRE18

Estadísticos de prueba^a

POST 18 -
PRE18

Z	-6,115 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE19
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE19	100	100,0%	0	0,0%	100	100,0%

Descriptivos

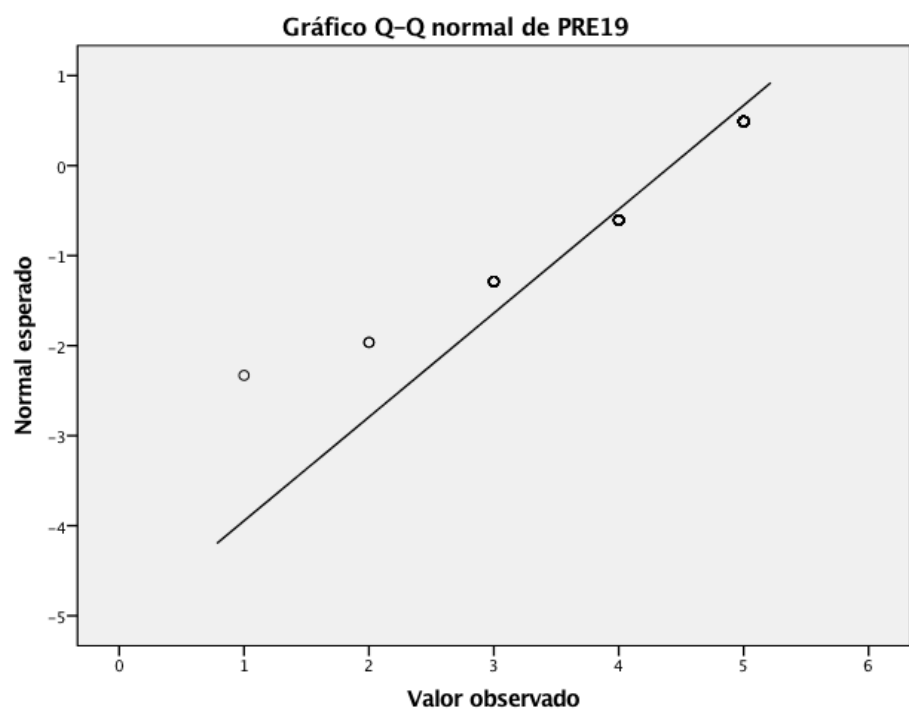
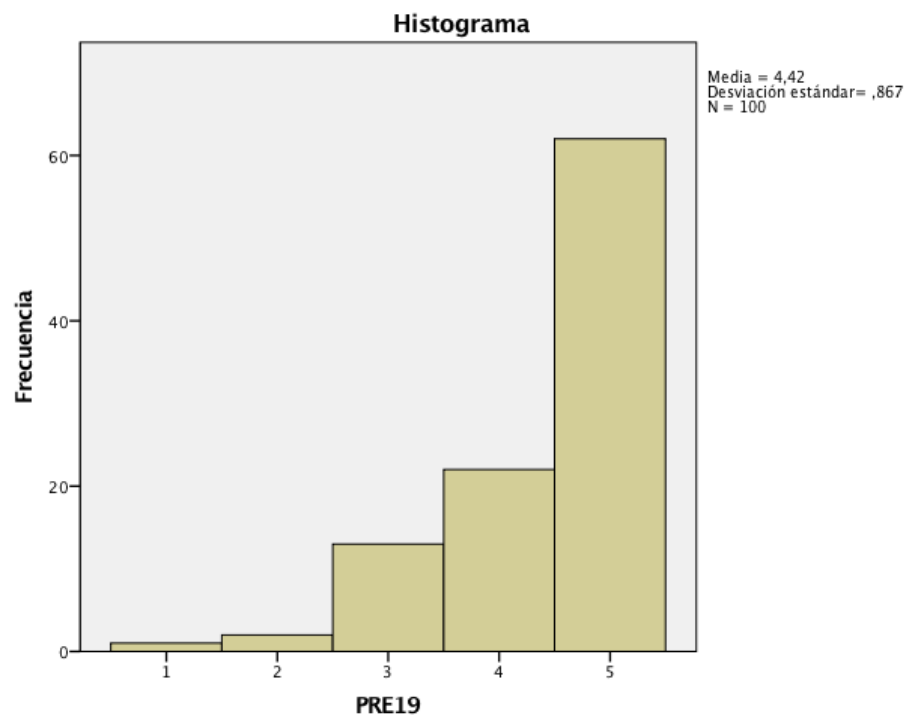
			Estadístico	Error estándar
PRE19	Media		4,42	,087
	95% de intervalo de confianza para la media	Límite inferior	4,25	
		Límite superior	4,59	
	Media recortada al 5%		4,51	
	Mediana		5,00	
	Varianza		,751	
	Desviación estándar		,867	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		-1,506	,241
	Curtosis		1,966	,478

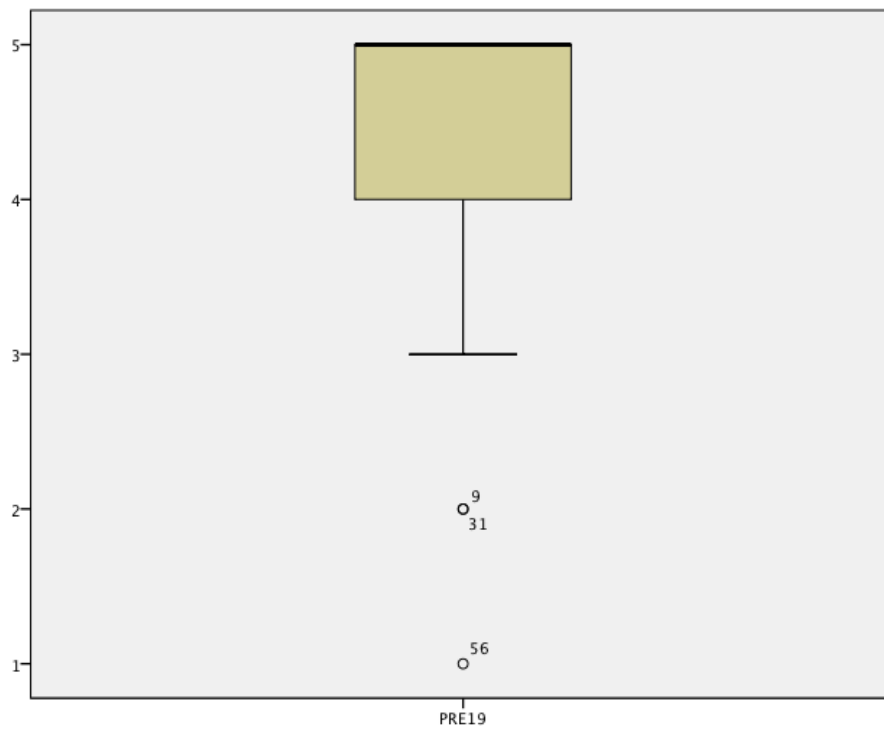
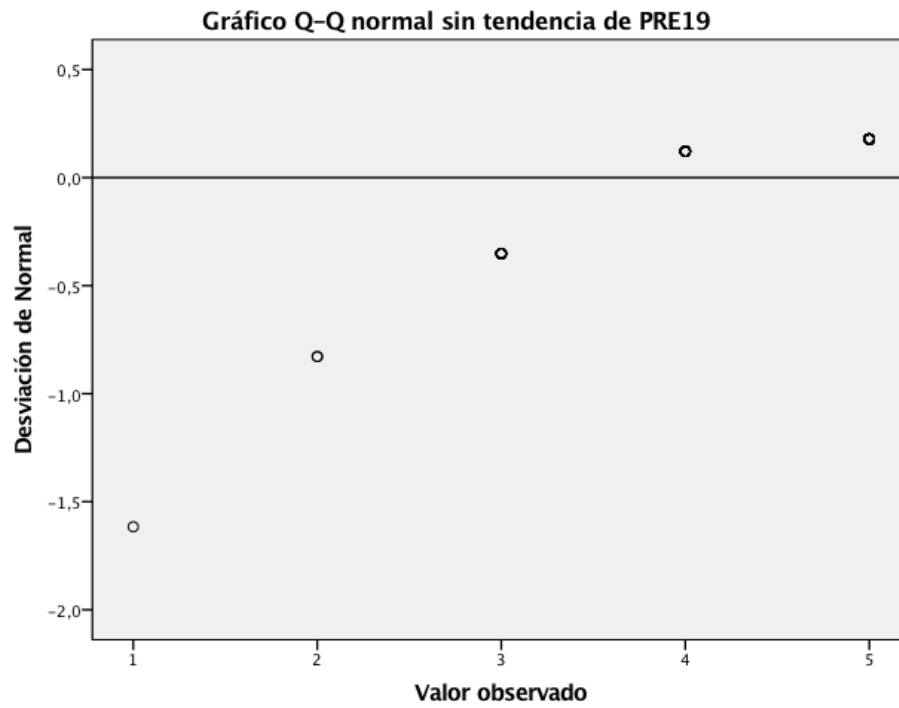
Pruebas de normalidad

Kolmogorov-Smirnov ^a				Shapiro-Wilk		
	Estadístic		Sig.	Estadístic		Sig.
	o	gl		o	gl	
PRE19	,368	100	,000	,697	100	,000

a. Corrección de significación de Lilliefors

PRE19





```
EXAMINE VARIABLES=POST19
      /PLOT BOXPLOT HISTOGRAM NPLOT
```

```

/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 19	98	98,0%	2	2,0%	100	100,0%

Descriptivos

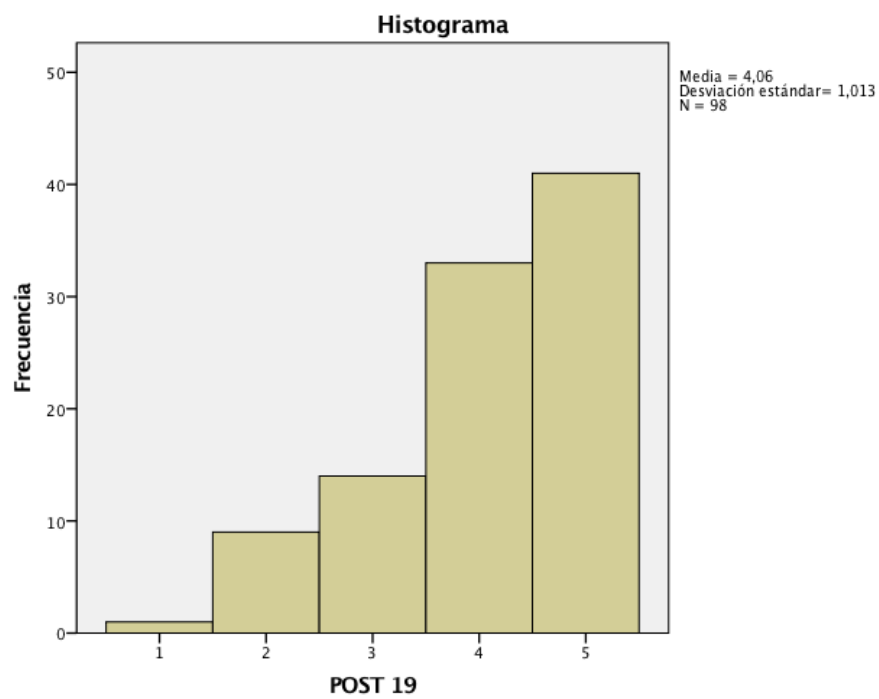
			Estadístico	Error estándar
POST 19	Media		4,06	,102
	95% de intervalo de confianza para la media	Límite inferior	3,86	
		Límite superior	4,26	
	Media recortada al 5%		4,13	
	Mediana		4,00	
	Varianza		1,027	
	Desviación estándar		1,013	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		-,913	,244
	Curtosis		,022	,483

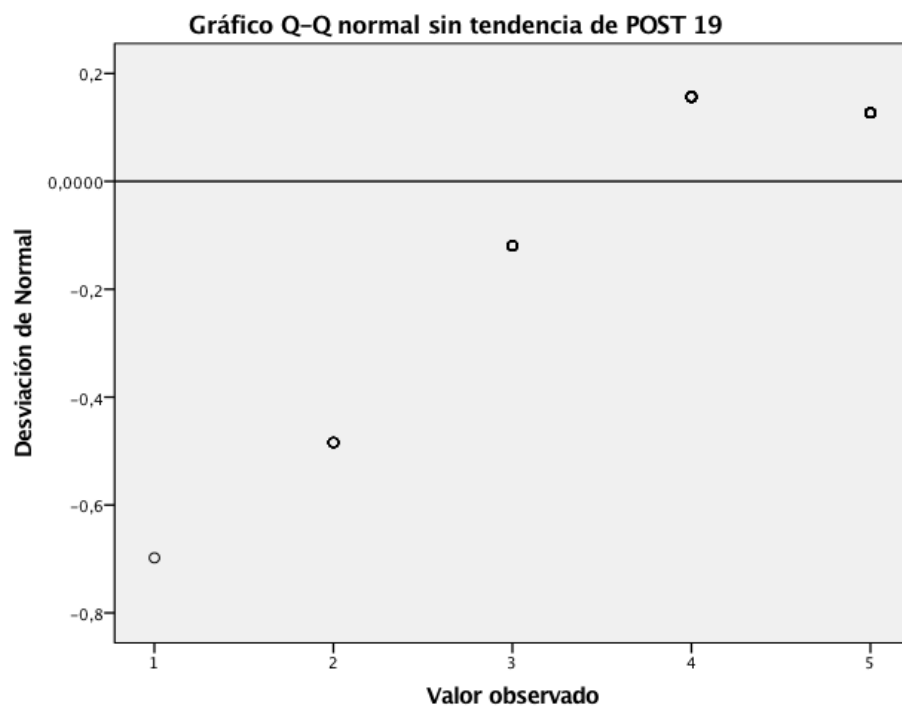
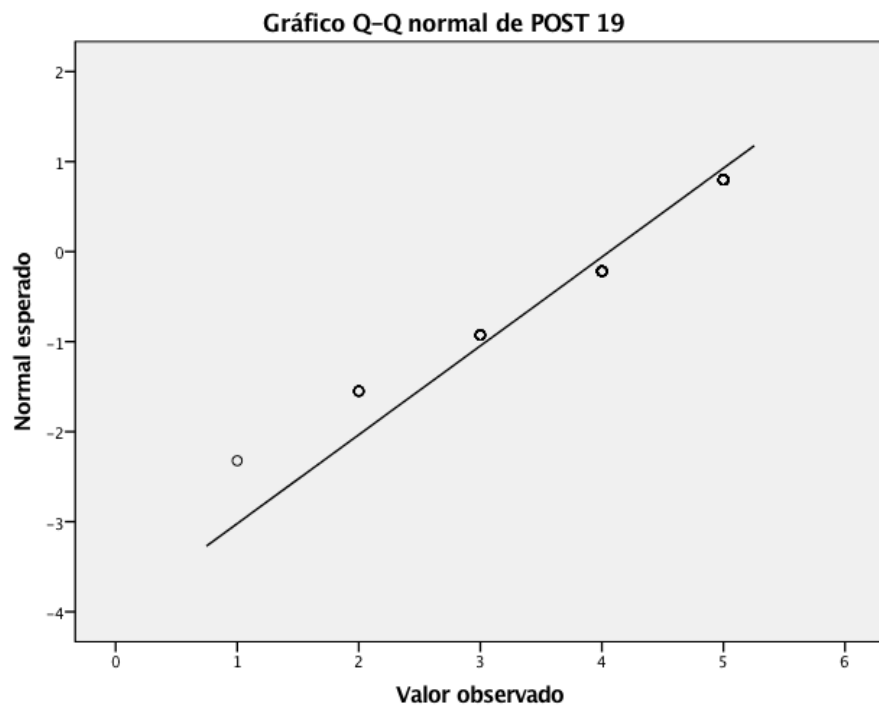
Pruebas de normalidad

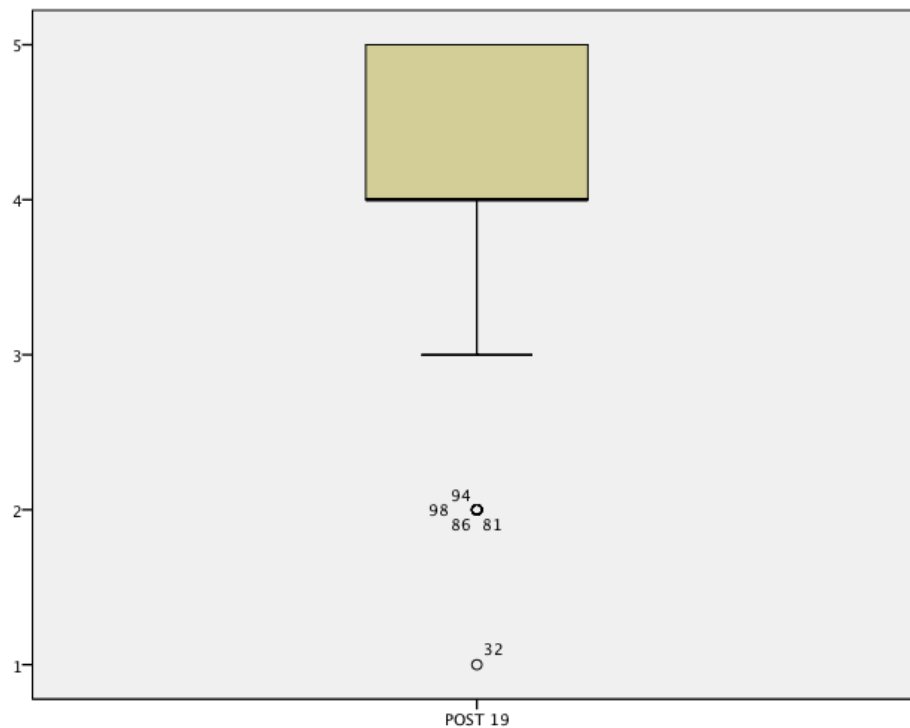
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic o	gl	Sig.	Estadístic o	gl	Sig.
POST 19	,241	98	,000	,816	98	,000

a. Corrección de significación de Lilliefors

POST 19







NPAR TESTS

/WILCOXON=PRE19 WITH POST19 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE19	100	4,42	,867	1	5
POST 19	98	4,06	1,013	1	5

Prueba de rangos con signo de Wilcoxon

Rangos

		N	Rango promedio	Suma de rangos
POST 19 - PRE19	Rangos negativos	36 ^a	28,61	1030,00
	Rangos positivos	18 ^b	25,28	455,00
	Empates	44 ^c		
	Total	98		

a. POST 19 < PRE19

b. POST 19 > PRE19

c. POST 19 = PRE19

Estadísticos de prueba^a

POST 19 - PRE19	
Z	-2,534 ^b
Sig. asintótica (bilateral)	,011

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos positivos.

```
EXAMINE VARIABLES=PRE20
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

Válido		Casos Perdidos		Total	
N	Porcentaje	N	Porcentaje	N	Porcentaje
	e		e		e

PRE20	100	100,0%	0	0,0%	100	100,0%
-------	-----	--------	---	------	-----	--------

Descriptivos

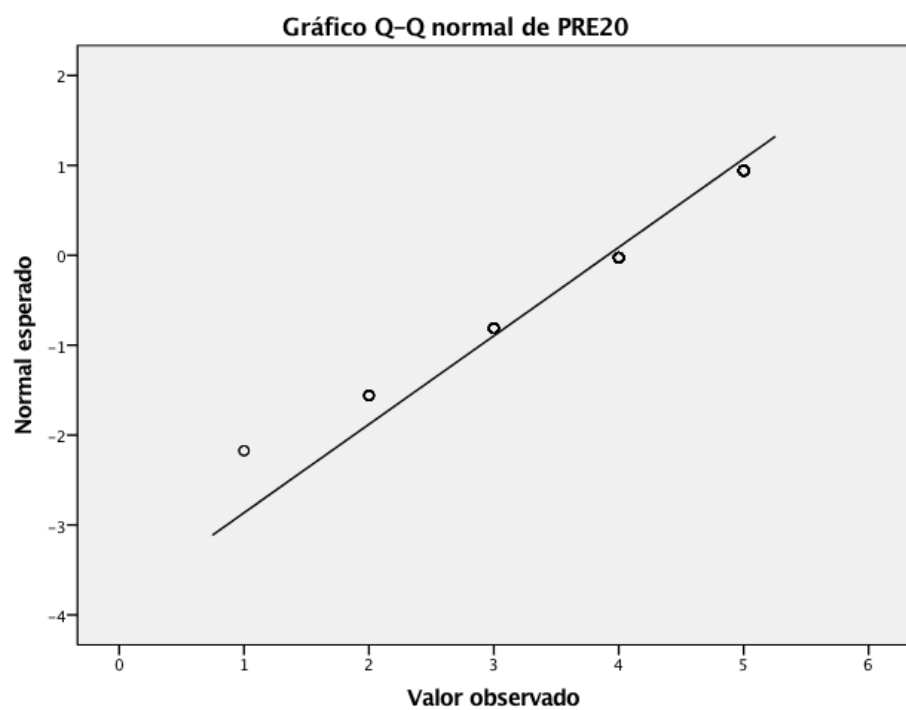
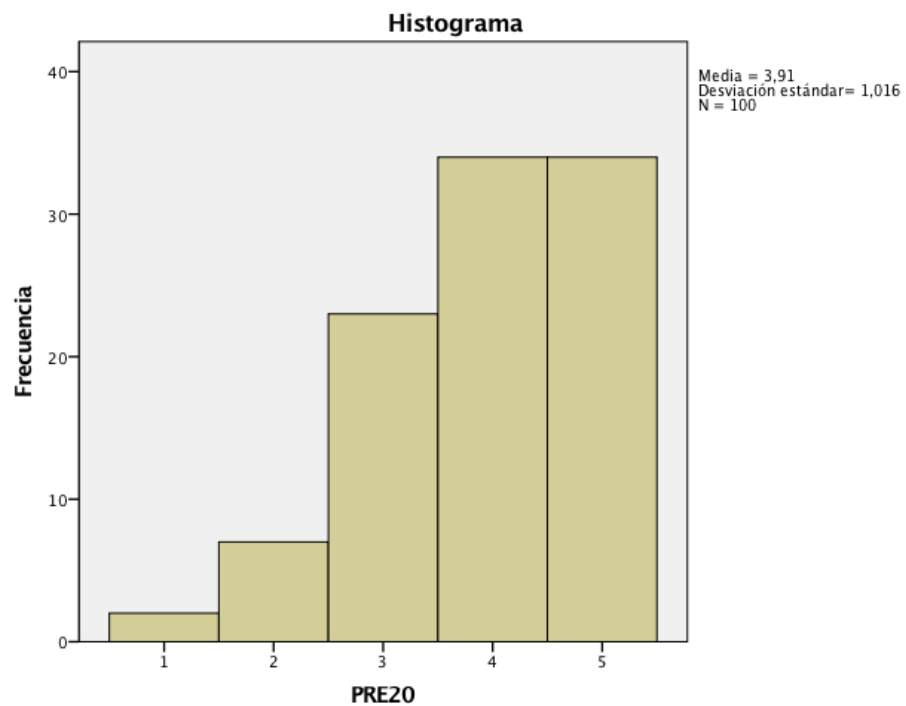
			Estadístico	Error estándar
			o	
PRE20	Media		3,91	,102
	95% de intervalo de confianza para la media	Límite inferior	3,71	
		Límite superior	4,11	
	Media recortada al 5%		3,98	
	Mediana		4,00	
	Varianza		1,032	
	Desviación estándar		1,016	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		-,701	,241
	Curtosis		-,068	,478

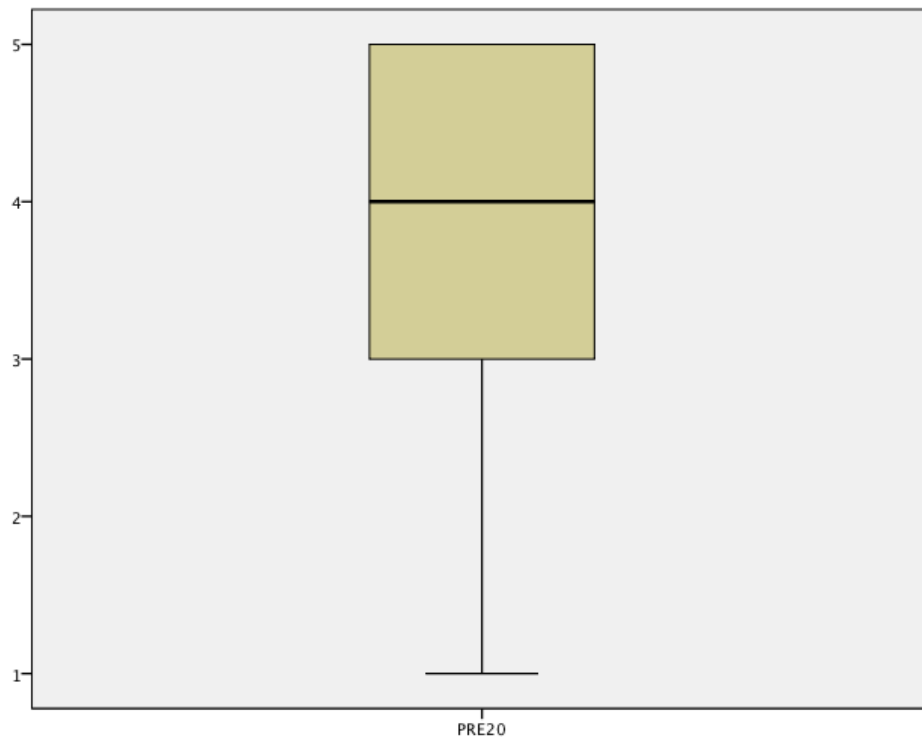
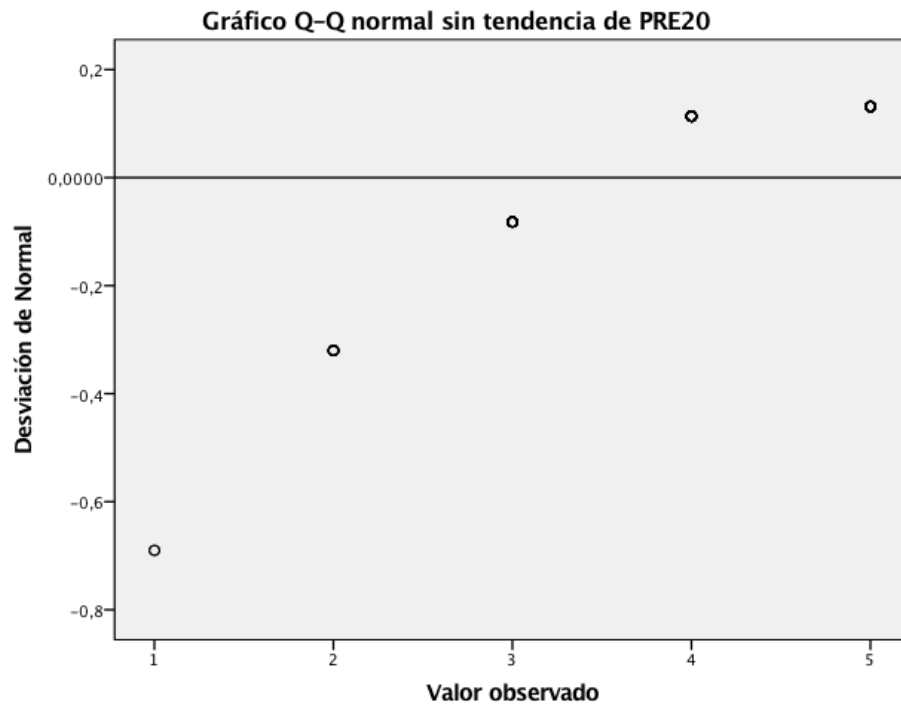
Pruebas de normalidad

Kolmogorov-Smirnov ^a				Shapiro-Wilk		
	Estadístic	gl	Sig.	Estadístic	gl	Sig.
	o			o		
PRE20	,215	100	,000	,856	100	,000

a. Corrección de significación de Lilliefors

PRE20





EXAMINE VARIABLES=POST20

```

/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 20	90	90,0%	10	10,0%	100	100,0%

Descriptivos

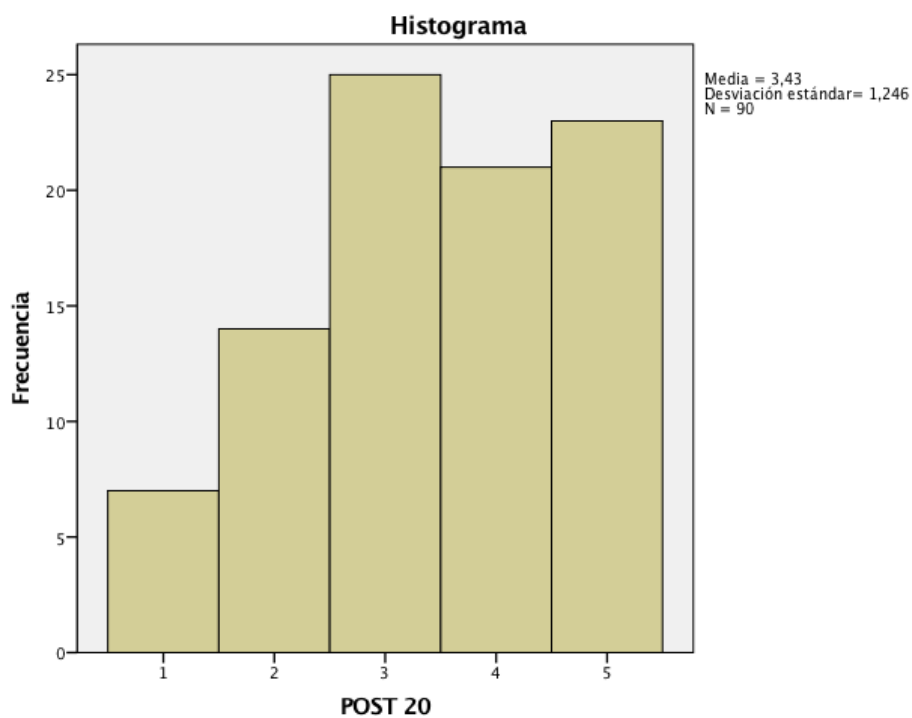
			Estadístico	Error estándar
POST 20	Media		3,43	,131
	95% de intervalo de confianza para la media	Límite inferior	3,17	
		Límite superior	3,69	
	Media recortada al 5%		3,48	
	Mediana		3,00	
	Varianza		1,552	
	Desviación estándar		1,246	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		-,308	,254
	Curtosis		-,877	,503

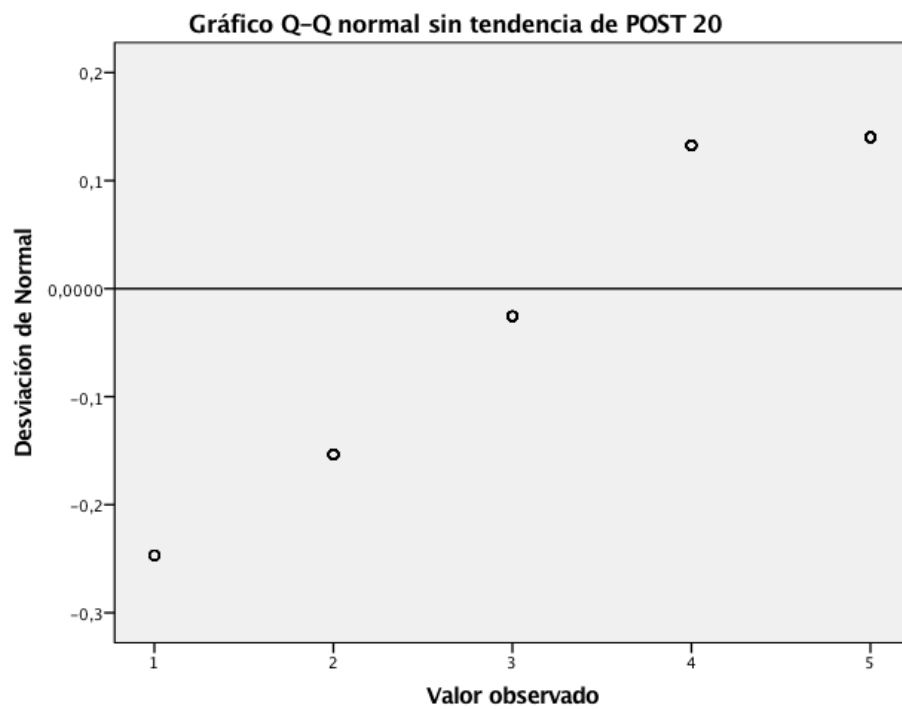
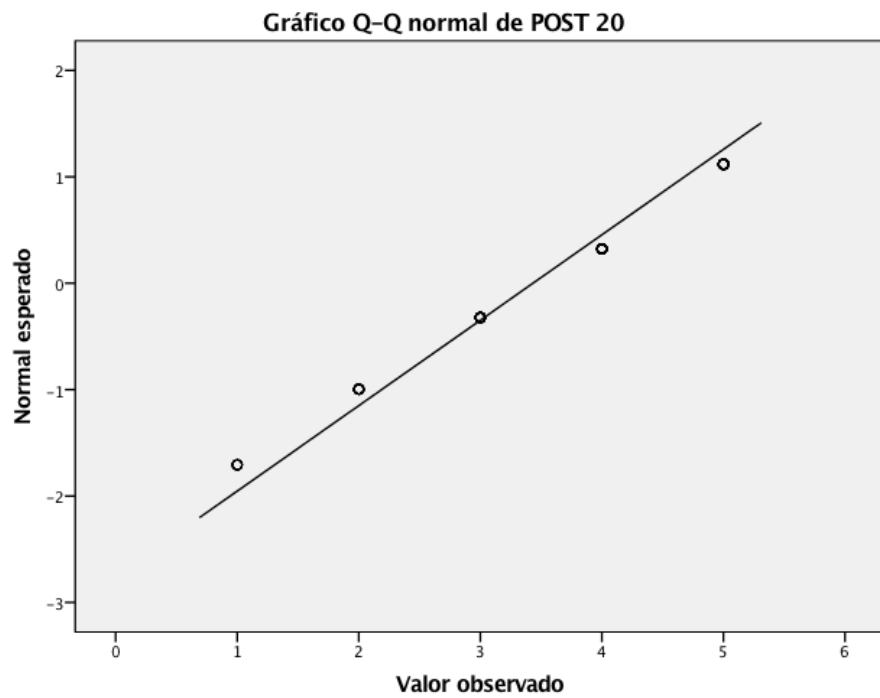
Pruebas de normalidad

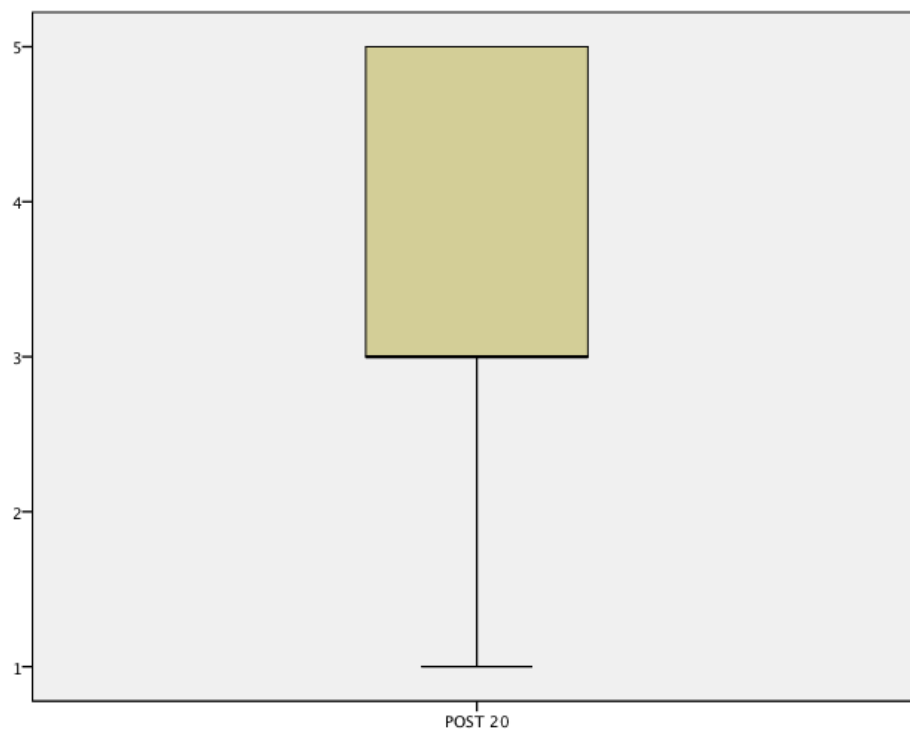
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 20	,164	90	,000	,895	90	,000

a. Corrección de significación de Lilliefors

POST 20







NPAR TESTS

/WILCOXON=PRE20 WITH POST20 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE20	100	3,91	1,016	1	5
POST 20	90	3,43	1,246	1	5

Prueba de rangos con signo de Wilcoxon

Rangos

	N	Rango promedio	Suma de rangos
--	---	-------------------	-------------------

POST 20 - PRE20	Rangos negativos	40 ^a	33,66	1346,50
	Rangos positivos	21 ^b	25,93	544,50
	Empates	29 ^c		
	Total	90		

a. POST 20 < PRE20

b. POST 20 > PRE20

c. POST 20 = PRE20

Estadísticos de prueba^a

POST 20 -
PRE20

Z	-2,963 ^b
Sig. asintótica (bilateral)	,003

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos positivos.

```
EXAMINE VARIABLES=PRE21
/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE21	99	99,0%	1	1,0%	100	100,0%

Descriptivos

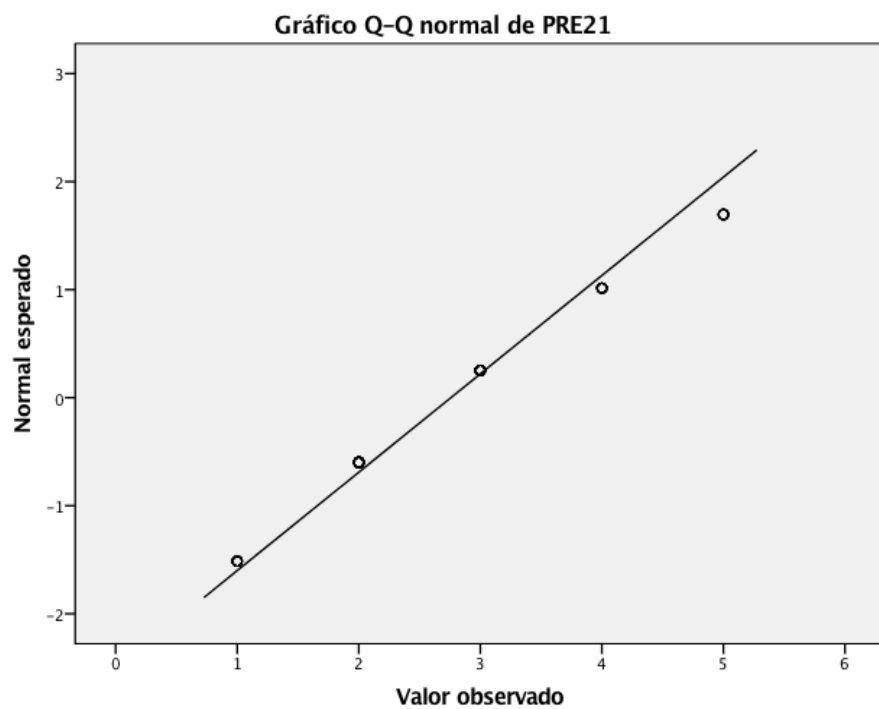
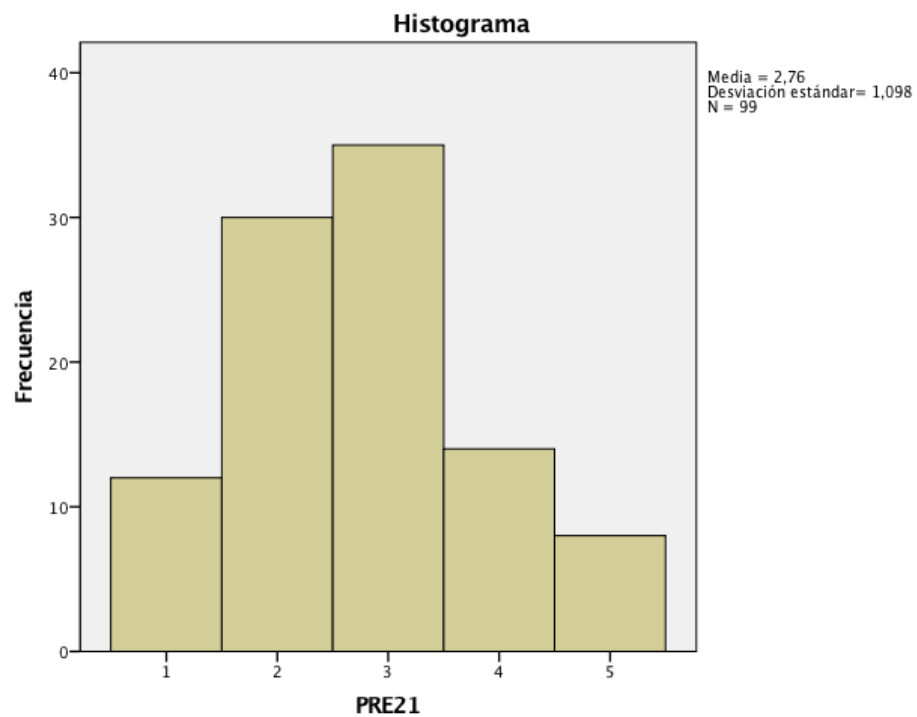
			Estadístico	Error estándar
PRE21	Media		2,76	,110
	95% de intervalo de confianza para la media	Límite inferior	2,54	
		Límite superior	2,98	
	Media recortada al 5%		2,73	
	Mediana		3,00	
	Varianza		1,206	
	Desviación estándar		1,098	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		,310	,243
	Curtosis		-,407	,481

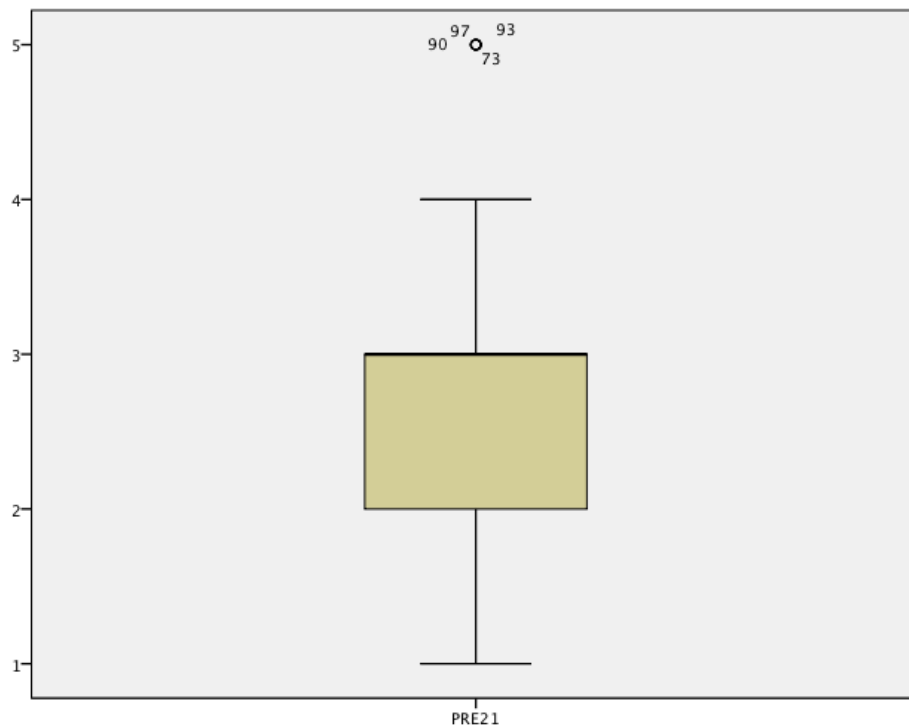
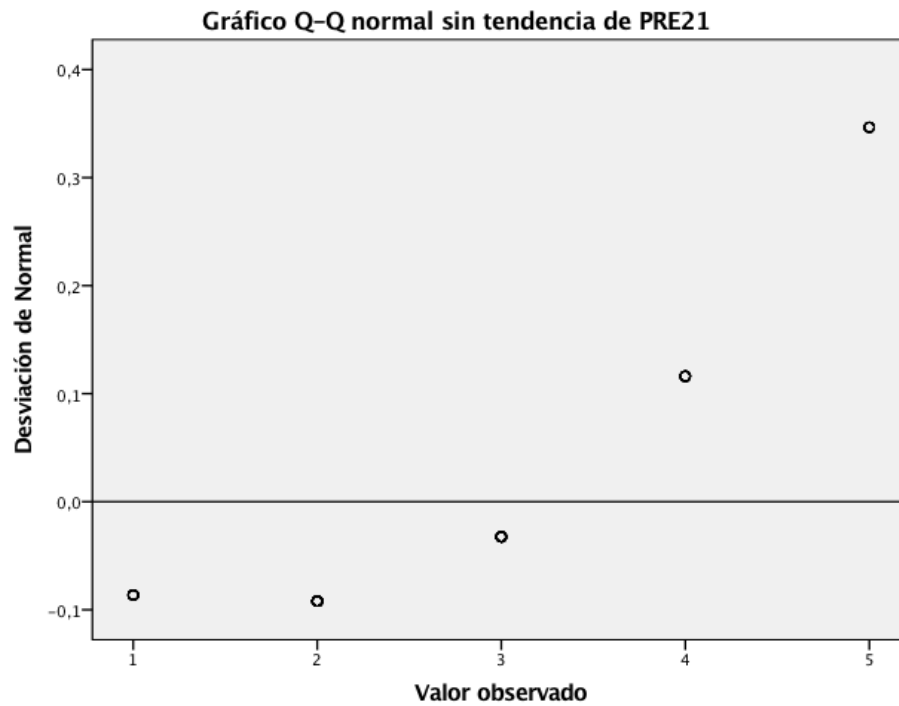
Pruebas de normalidad

Kolmogorov-Smirnov ^a			Shapiro-Wilk			
Estadístic			Estadístic			
o	gl	Sig.	o	gl	Sig.	
PRE21	,190	99	,000	,907	99	,000

a. Corrección de significación de Lilliefors

PRE21





```
EXAMINE VARIABLES=POST21
      /PLOT BOXPLOT HISTOGRAM NPLOT
```

```

/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 21	84	84,0%	16	16,0%	100	100,0%

Descriptivos

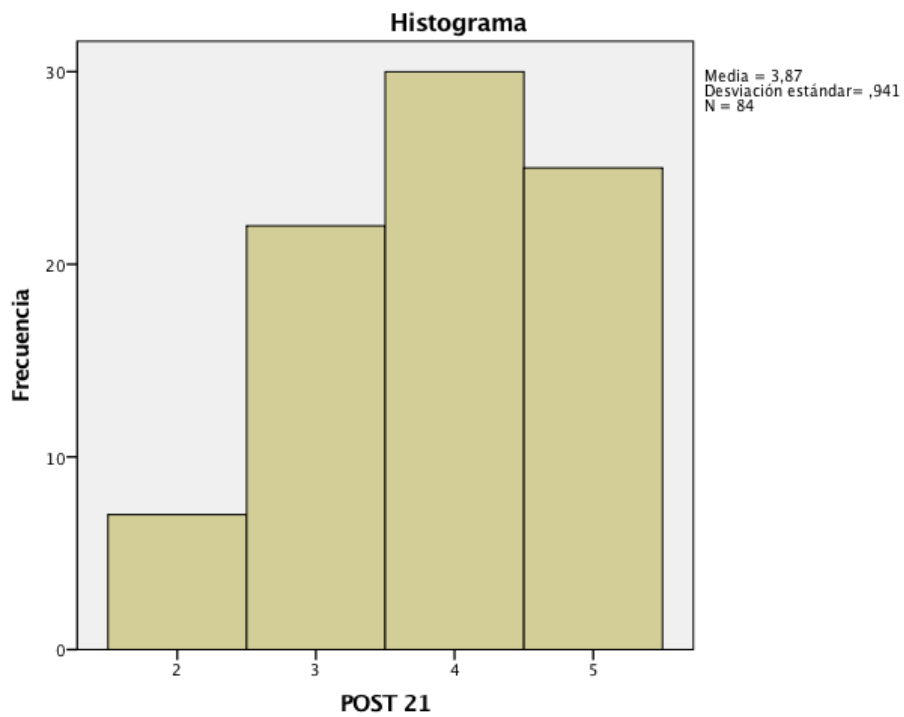
			Estadístico	Error estándar
POST 21	Media		3,87	,103
	95% de intervalo de confianza para la media	Límite inferior	3,66	
		Límite superior	4,07	
	Media recortada al 5%		3,91	
	Mediana		4,00	
	Varianza		,886	
	Desviación estándar		,941	
	Mínimo		2	
	Máximo		5	
	Rango		3	
	Rango intercuartil		2	
	Asimetría		-,354	,263
	Curtosis		-,822	,520

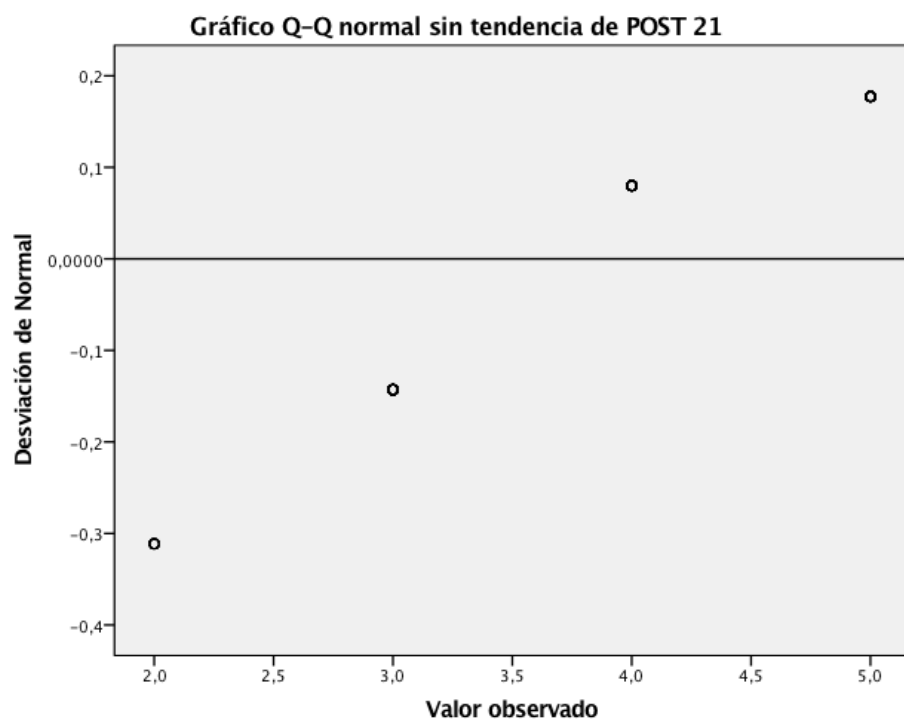
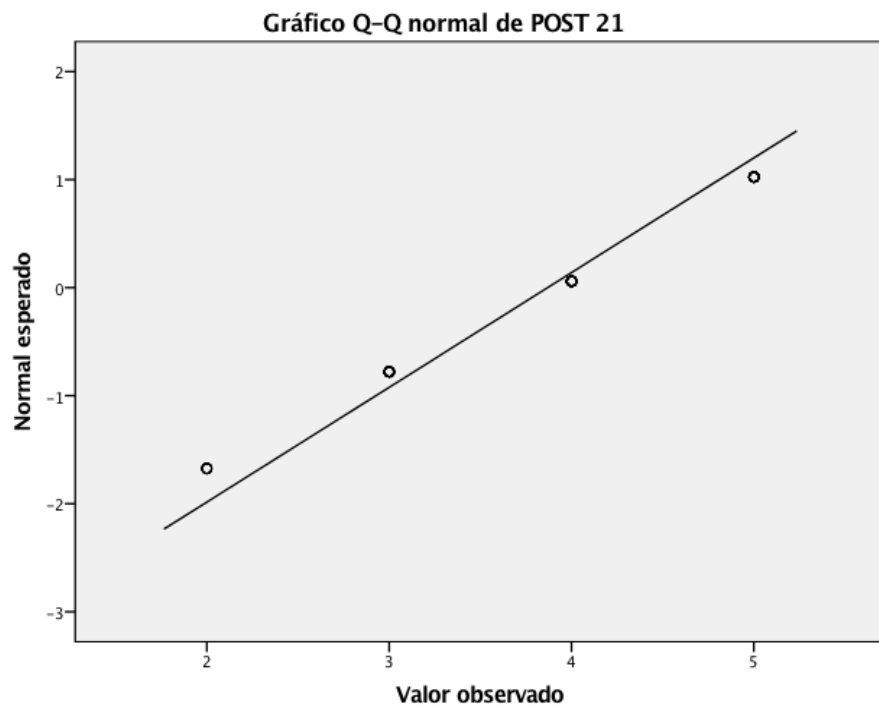
Pruebas de normalidad

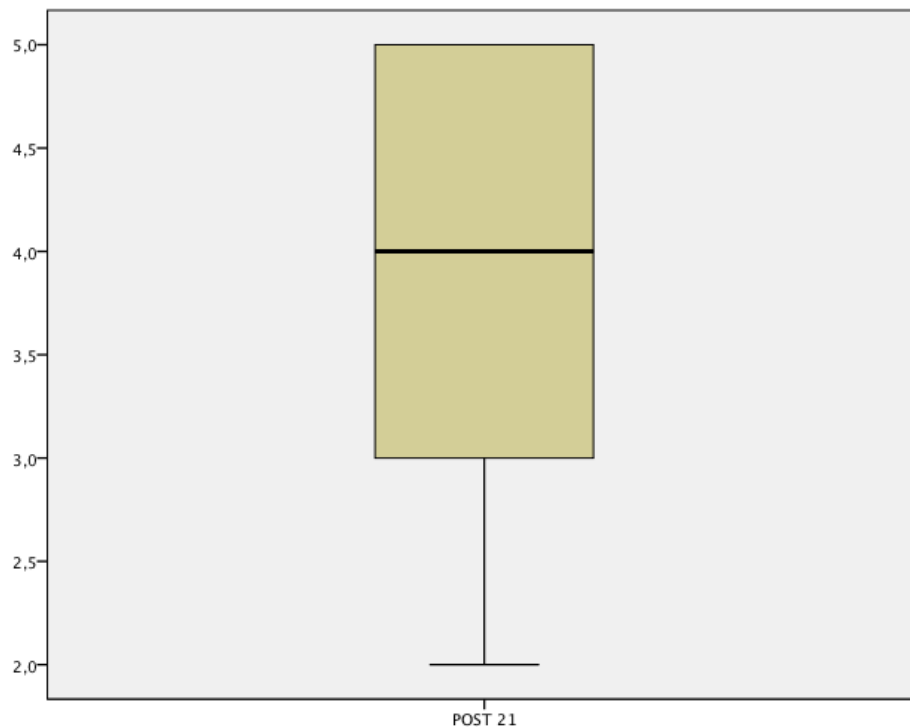
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic o	gl	Sig.	Estadístic o	gl	Sig.
POST 21	,210	84	,000	,861	84	,000

a. Corrección de significación de Lilliefors

POST 21







NPAR TESTS

/WILCOXON=PRE21 WITH POST21 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE21	99	2,76	1,098	1	5
POST 21	84	3,87	,941	2	5

Prueba de rangos con signo de Wilcoxon

Rangos

		N	Rango promedio	Suma de rangos
POST 21 - PRE21	Rangos negativos	11 ^a	21,14	232,50
	Rangos positivos	59 ^b	38,18	2252,50
	Empates	13 ^c		
	Total	83		

a. POST 21 < PRE21

b. POST 21 > PRE21

c. POST 21 = PRE21

Estadísticos de prueba^a

POST 21 - PRE21	
Z	-6,037 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE22
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

Válido		Casos Perdidos		Total	
N	Porcentaje	N	Porcentaje	N	Porcentaje
	e		e		e

PRE22	99	99,0%	1	1,0%	100	100,0%
-------	----	-------	---	------	-----	--------

Descriptivos

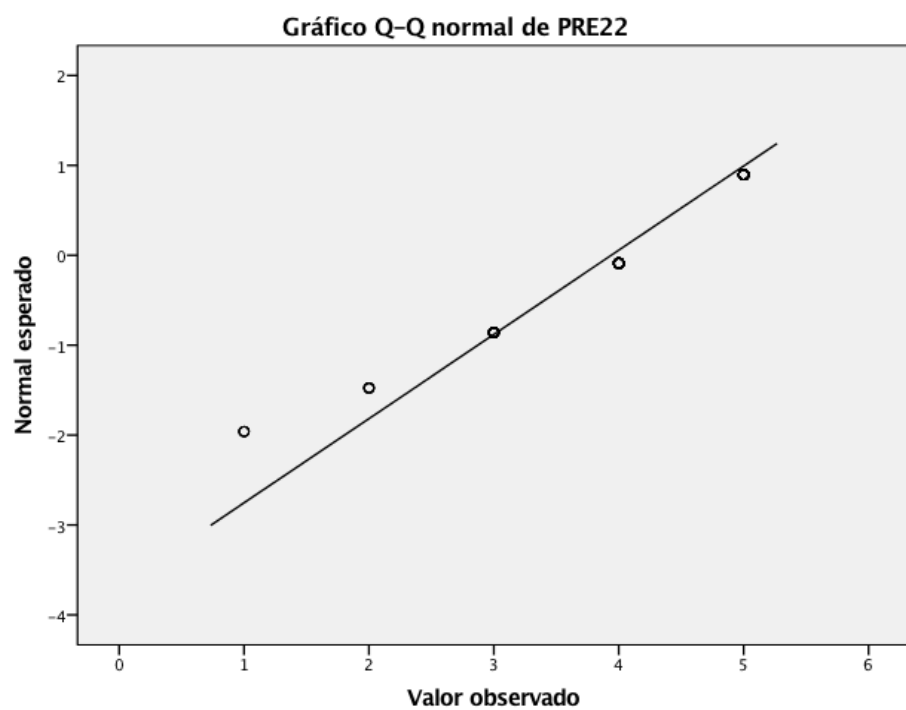
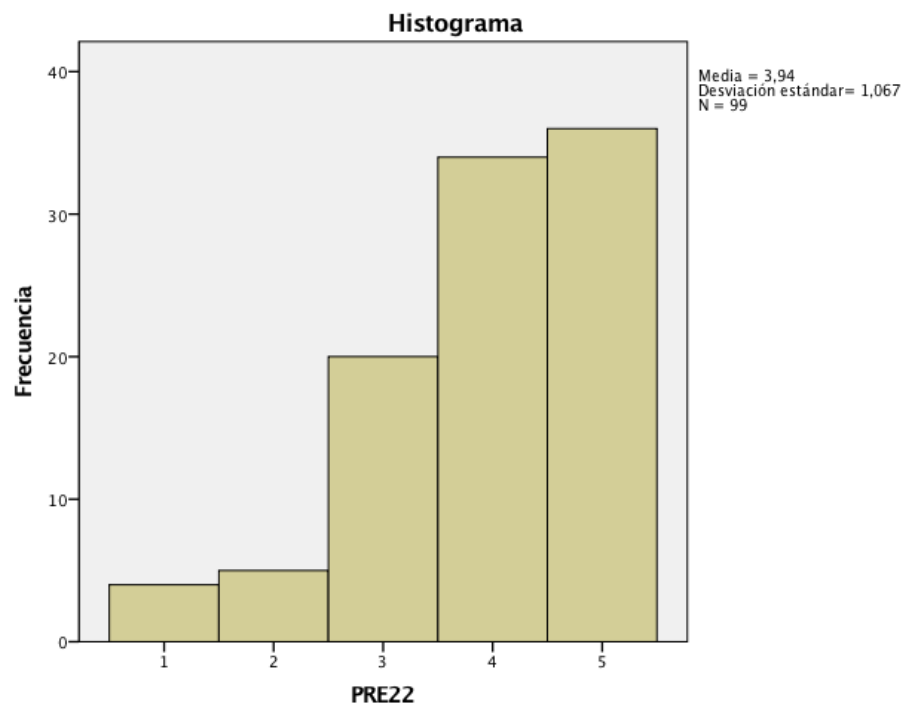
			Estadístico	Error estándar
PRE22	Media		3,94	,107
	95% de intervalo de confianza para la media	Límite inferior	3,73	
		Límite superior	4,15	
	Media recortada al 5%		4,03	
	Mediana		4,00	
	Varianza		1,139	
	Desviación estándar		1,067	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		-,957	,243
	Curtosis		,505	,481

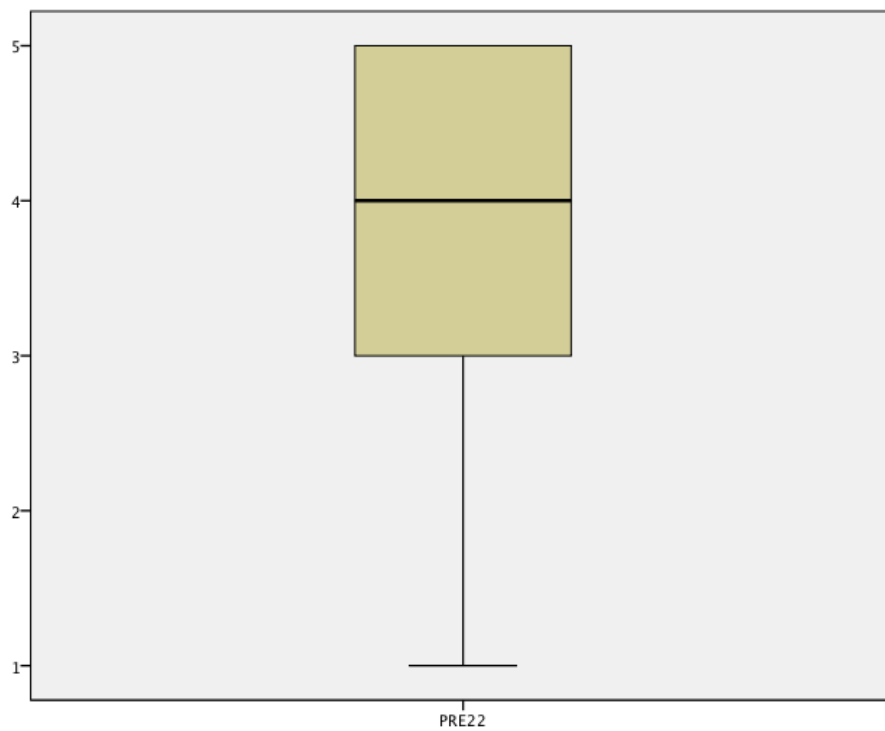
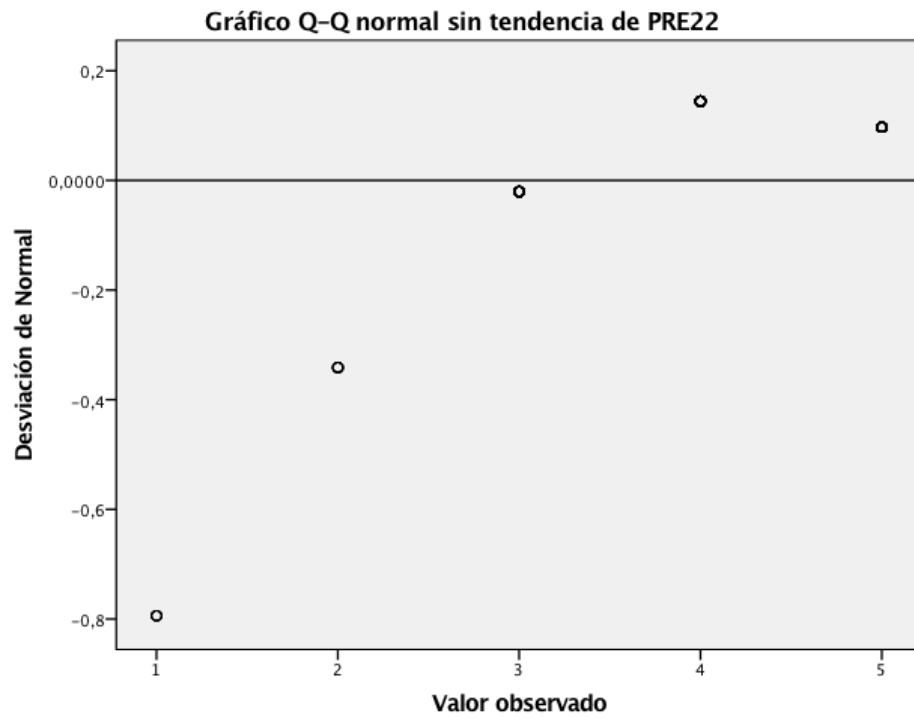
Pruebas de normalidad

Kolmogorov-Smirnov ^a				Shapiro-Wilk			
	Estadístic o	gl	Sig.		Estadístic o	gl	Sig.
PRE22	,230	99	,000		,835	99	,000

a. Corrección de significación de Lilliefors

PRE22





EXAMINE VARIABLES=POST22

```

/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 22	59	59,0%	41	41,0%	100	100,0%

Descriptivos

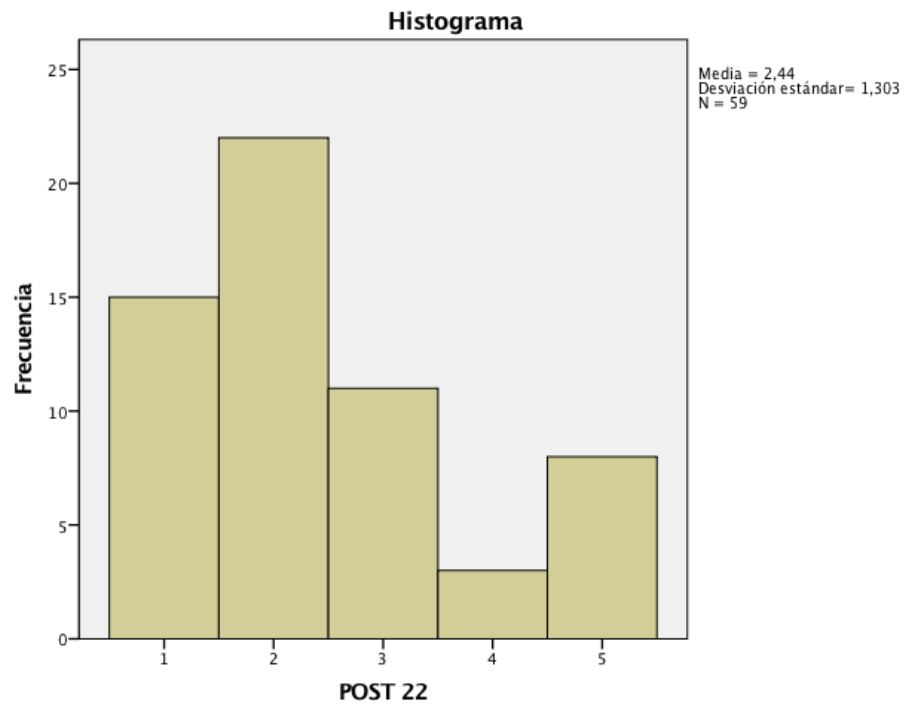
			Estadístico	Error estándar
POST 22	Media		2,44	,170
	95% de intervalo de confianza para la media	Límite inferior	2,10	
		Límite superior	2,78	
	Media recortada al 5%		2,38	
	Mediana		2,00	
	Varianza		1,699	
	Desviación estándar		1,303	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		,811	,311
	Curtosis		-,330	,613

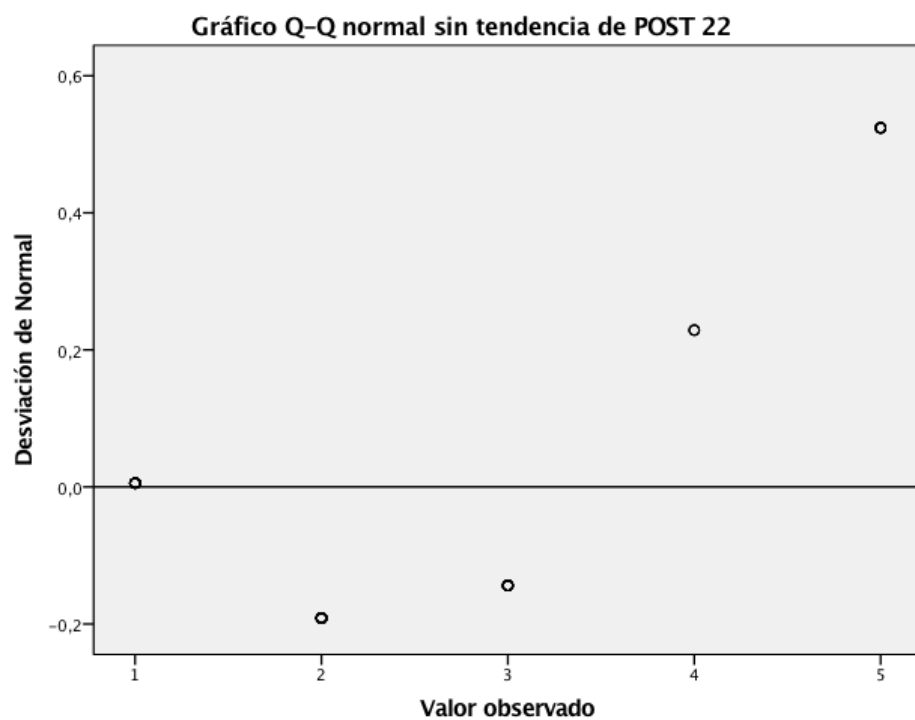
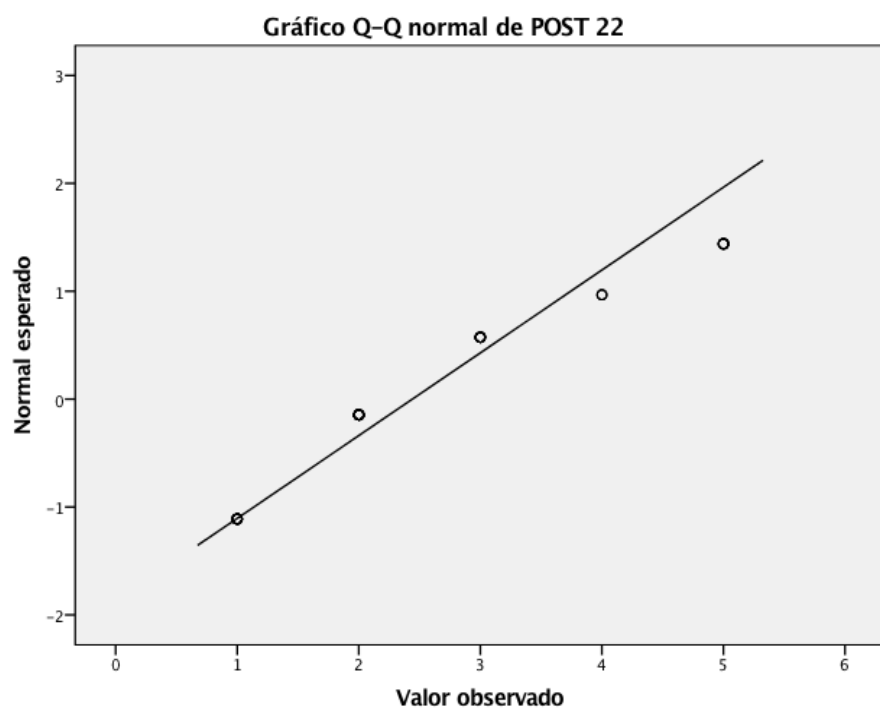
Pruebas de normalidad

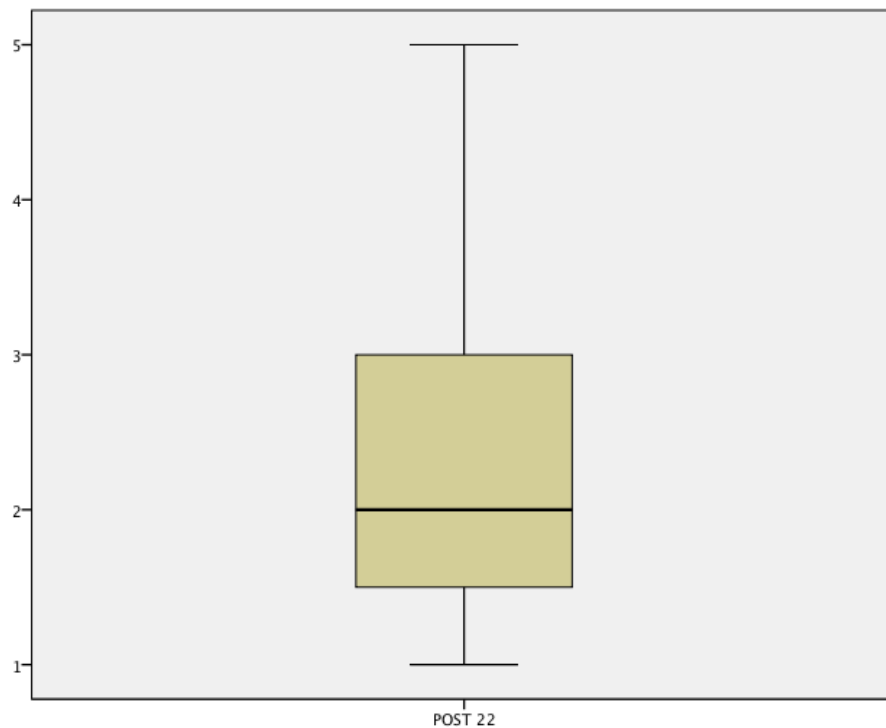
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 22	,259	59	,000	,841	59	,000

a. Corrección de significación de Lilliefors

POST 22







NPAR TESTS

/WILCOXON=PRE22 WITH POST22 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE22	99	3,94	1,067	1	5
POST 22	59	2,44	1,303	1	5

Prueba de rangos con signo de Wilcoxon

Rangos

		N	Rango promedio	Suma de rangos
POST 22 - PRE22	Rangos negativos	44 ^a	25,84	1137,00
	Rangos positivos	6 ^b	23,00	138,00
	Empates	9 ^c		
	Total	59		

a. POST 22 < PRE22

b. POST 22 > PRE22

c. POST 22 = PRE22

Estadísticos de prueba^a

POST 22 - PRE22	
Z	-4,870 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos positivos.

```
EXAMINE VARIABLES=PRE23
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

Válido		Casos Perdidos		Total	
N	Porcentaj e	N	Porcentaj e	N	Porcentaj e

PRE23	100	100,0%	0	0,0%	100	100,0%
-------	-----	--------	---	------	-----	--------

Descriptivos

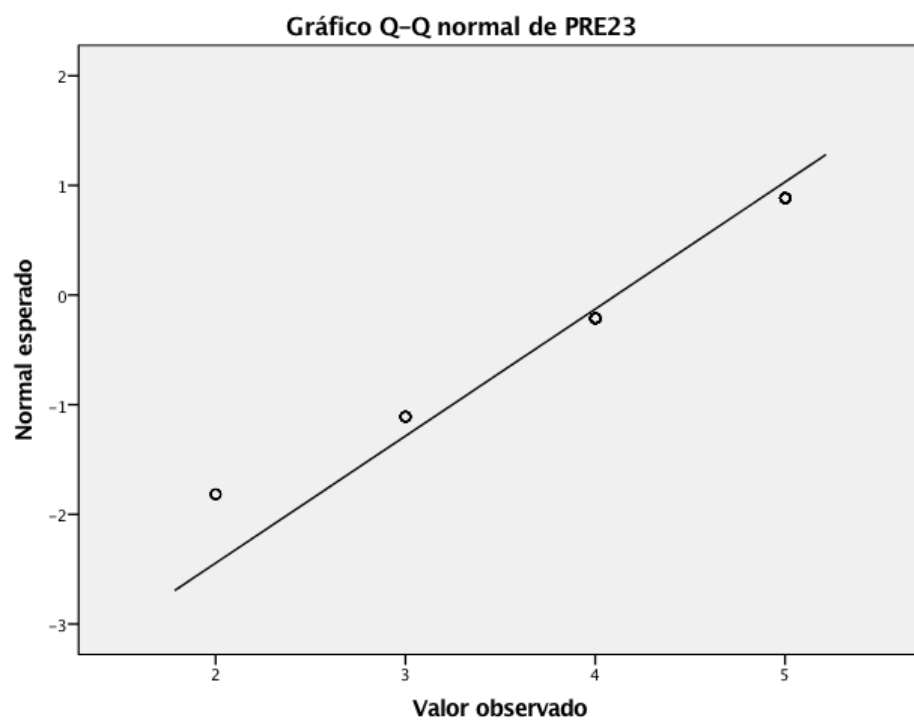
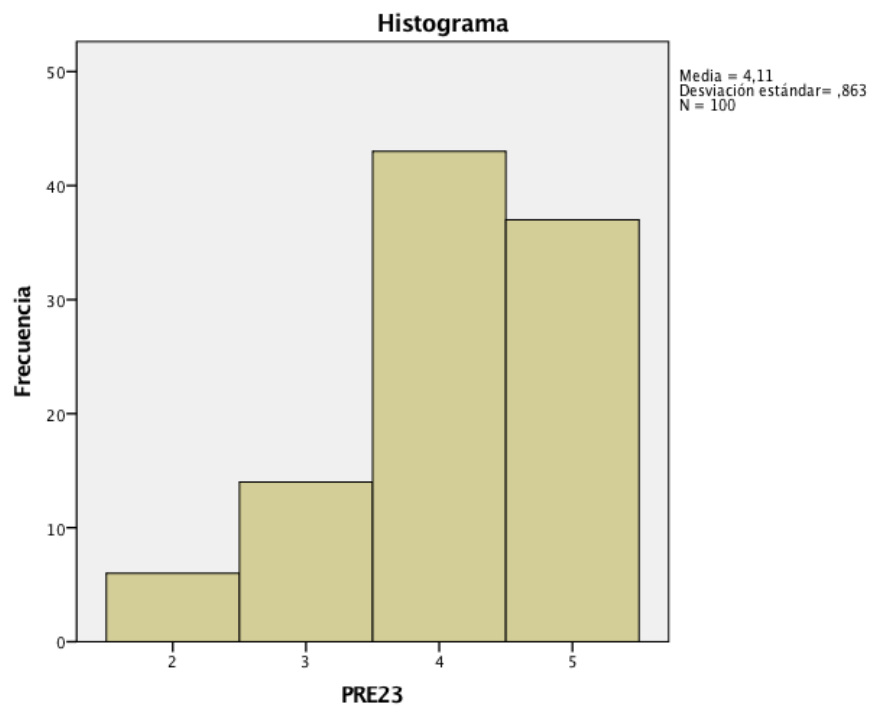
			Estadístico	Error estándar
			o	
PRE23	Media		4,11	,086
	95% de intervalo de confianza para la media	Límite inferior	3,94	
		Límite superior	4,28	
	Media recortada al 5%		4,18	
	Mediana		4,00	
	Varianza		,745	
	Desviación estándar		,863	
	Mínimo		2	
	Máximo		5	
	Rango		3	
	Rango intercuartil		1	
	Asimetría		-,793	,241
	Curtosis		,063	,478

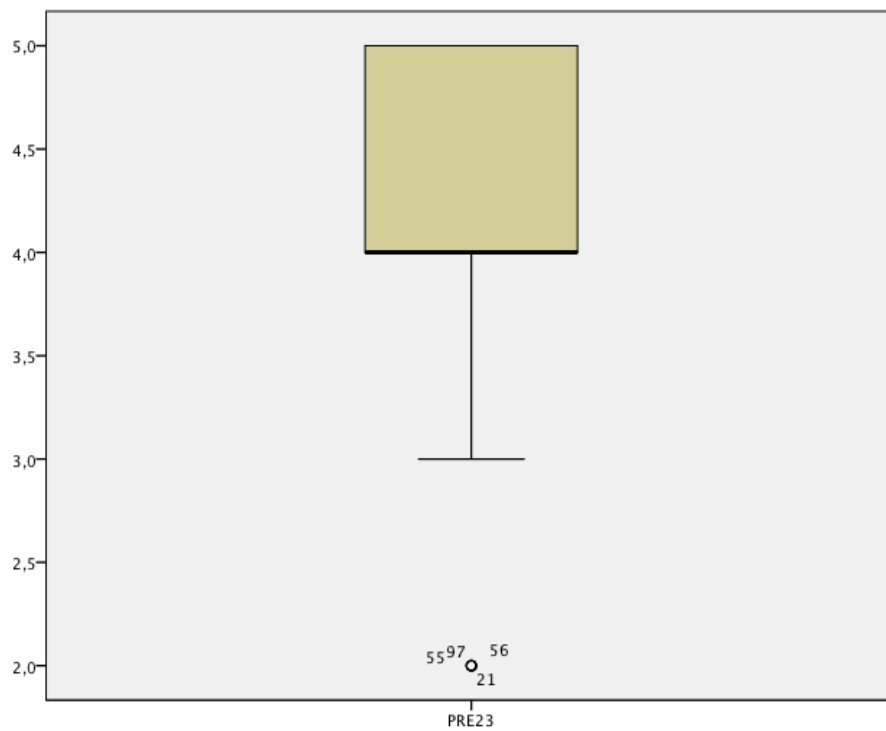
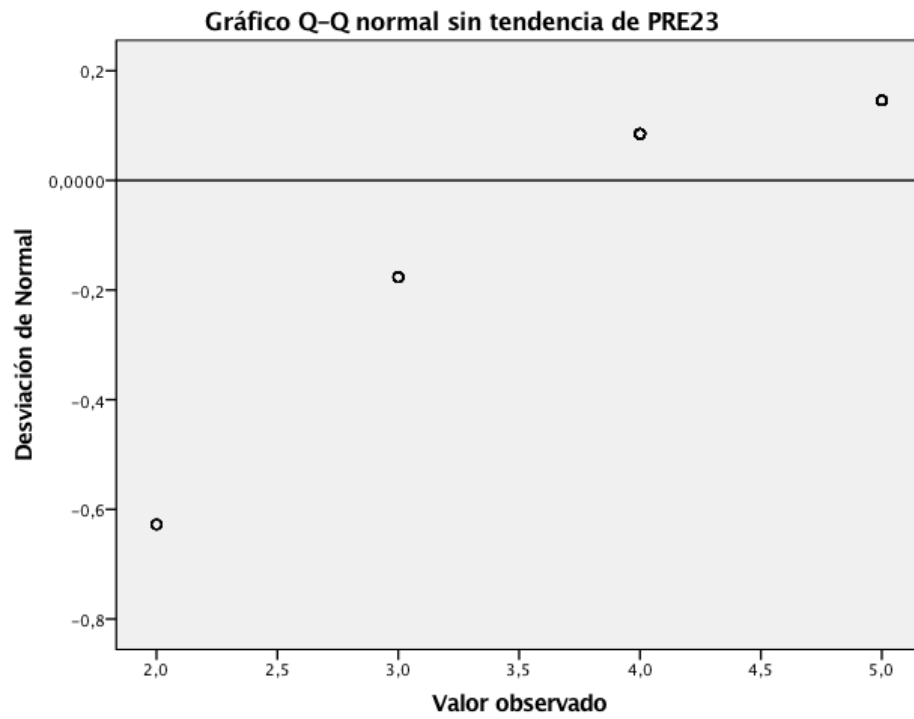
Pruebas de normalidad

Kolmogorov-Smirnov ^a				Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
PRE23	,249	100	,000	,818	100	,000

a. Corrección de significación de Lilliefors

PRE23





EXAMINE VARIABLES=POST23

```

/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 23	97	97,0%	3	3,0%	100	100,0%

Descriptivos

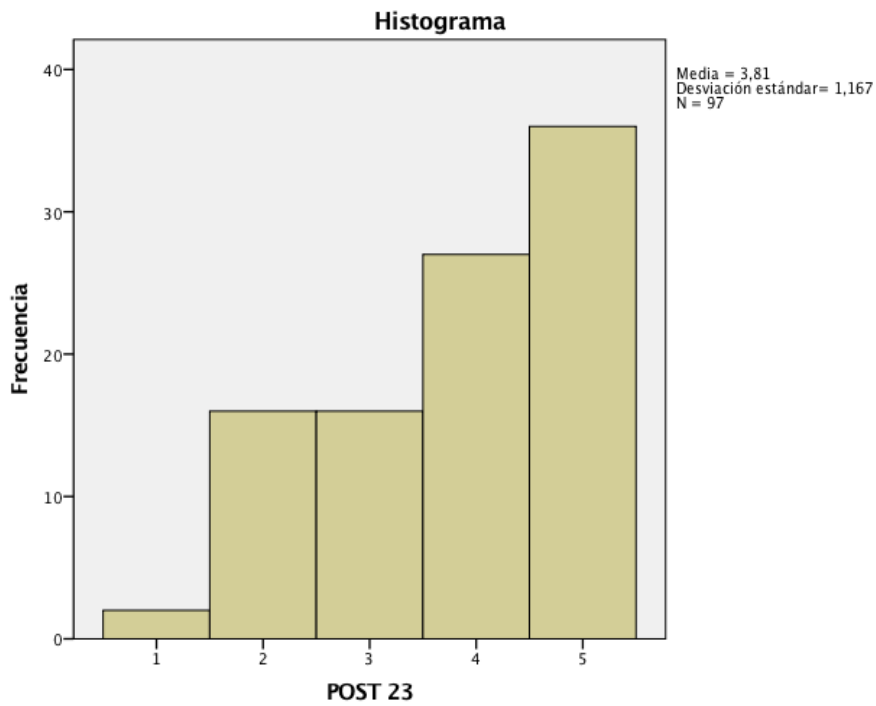
			Estadístico	Error estándar
POST 23	Media		3,81	,118
	95% de intervalo de confianza para la media	Límite inferior	3,58	
		Límite superior	4,05	
	Media recortada al 5%		3,87	
	Mediana		4,00	
	Varianza		1,361	
	Desviación estándar		1,167	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		-,594	,245
	Curtosis		-,839	,485

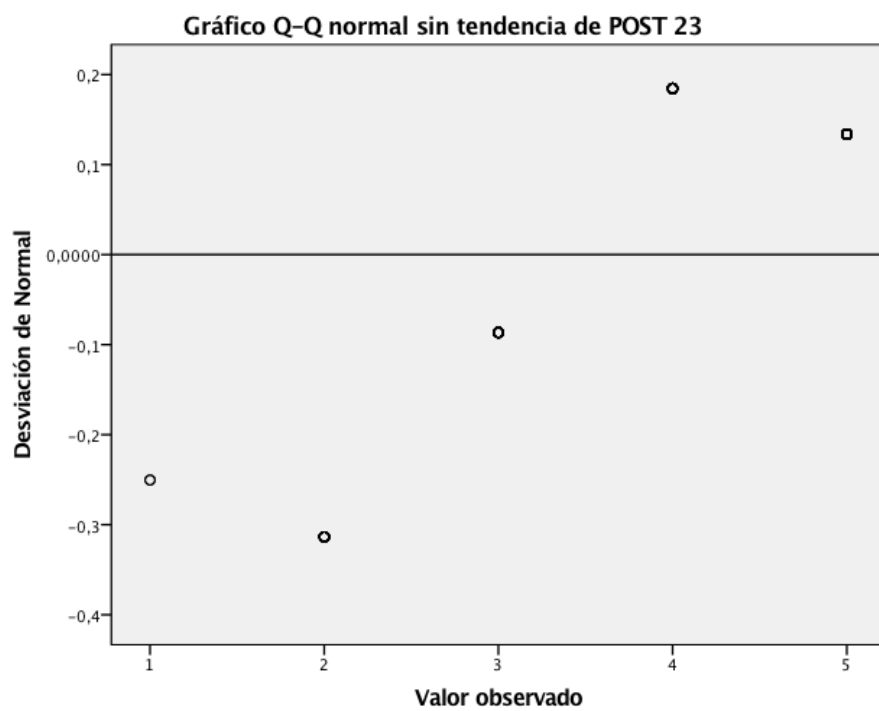
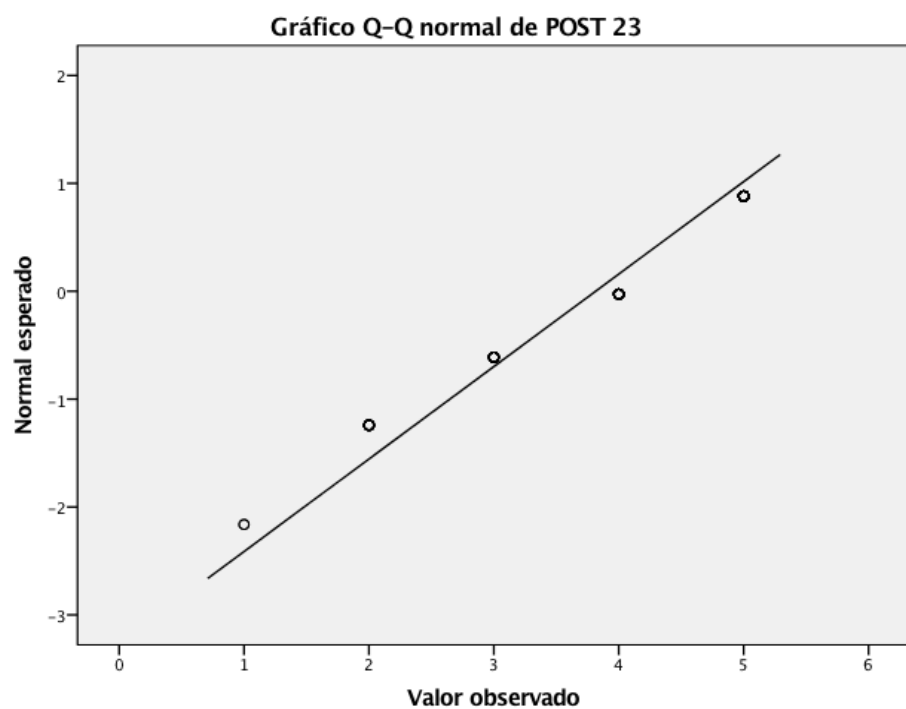
Pruebas de normalidad

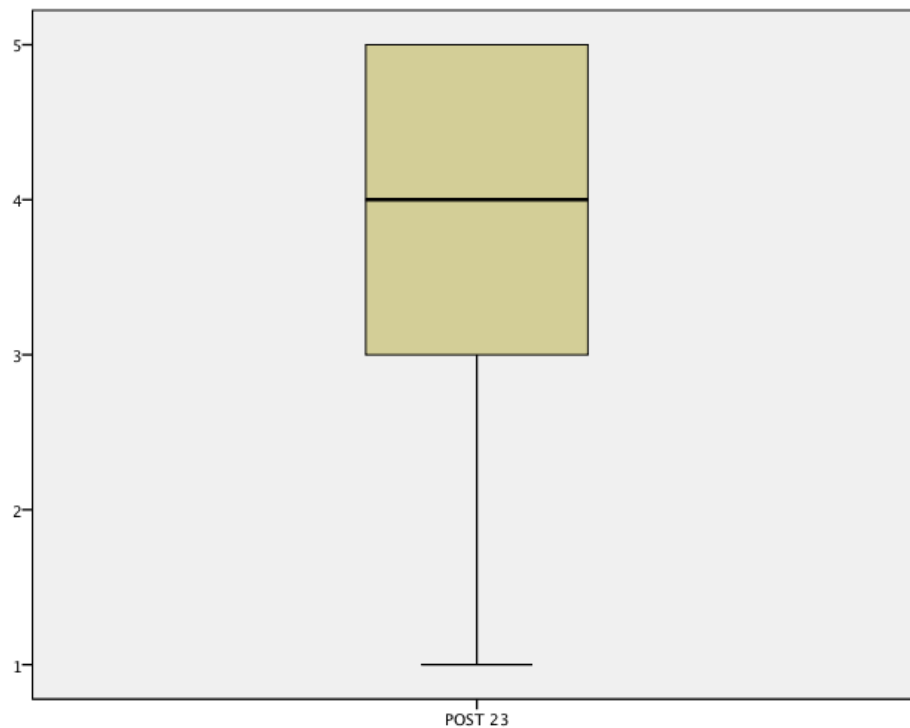
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 23	,216	97	,000	,844	97	,000

a. Corrección de significación de Lilliefors

POST 23







NPAR TESTS

/WILCOXON=PRE23 WITH POST23 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE23	100	4,11	,863	2	5
POST 23	97	3,81	1,167	1	5

Prueba de rangos con signo de Wilcoxon

Rangos

	N	Rango promedio	Suma de rangos
--	---	-------------------	-------------------

POST 23 - PRE23	Rangos negativos	39 ^a	35,12	1369,50
	Rangos positivos	26 ^b	29,83	775,50
	Empates	32 ^c		
	Total	97		

a. POST 23 < PRE23

b. POST 23 > PRE23

c. POST 23 = PRE23

Estadísticos de prueba^a

POST 23 -
PRE23

Z	-1,984 ^b
Sig. asintótica (bilateral)	,047

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos positivos.

```
EXAMINE VARIABLES=PRE24
/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE24	99	99,0%	1	1,0%	100	100,0%

Descriptivos

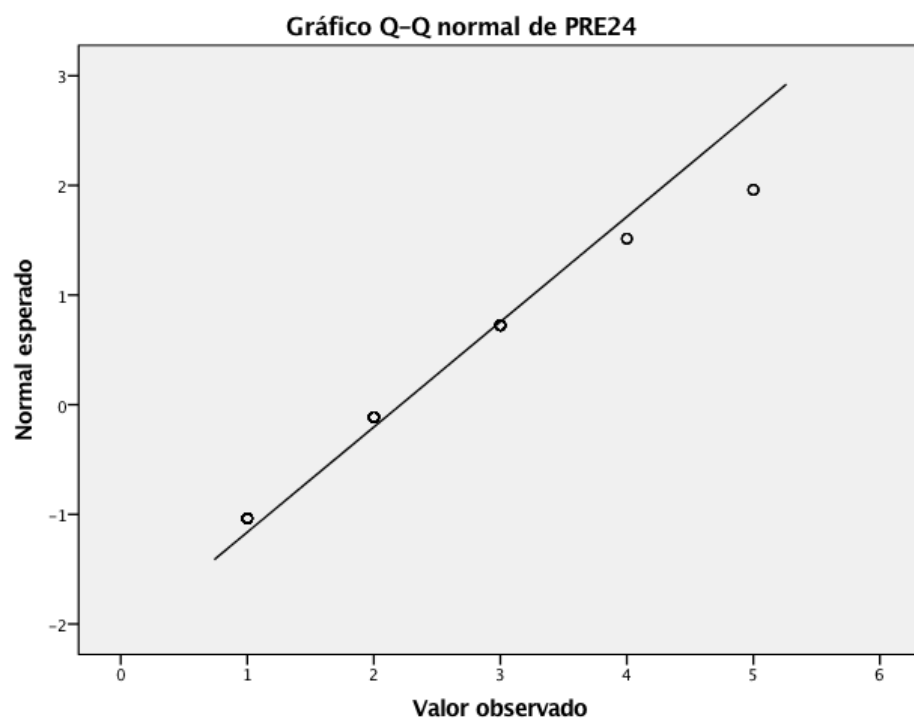
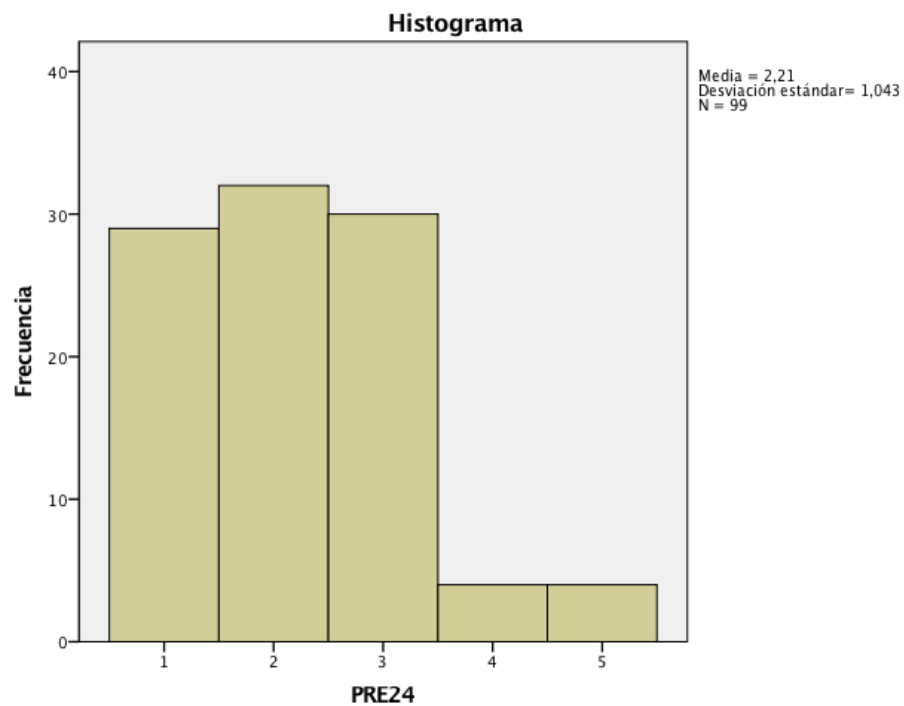
			Estadístico	Error estándar
PRE24	Media		2,21	,105
	95% de intervalo de confianza para la media	Límite inferior	2,00	
		Límite superior	2,42	
	Media recortada al 5%		2,14	
	Mediana		2,00	
	Varianza		1,087	
	Desviación estándar		1,043	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		2	
	Asimetría		,664	,243
	Curtosis		,180	,481

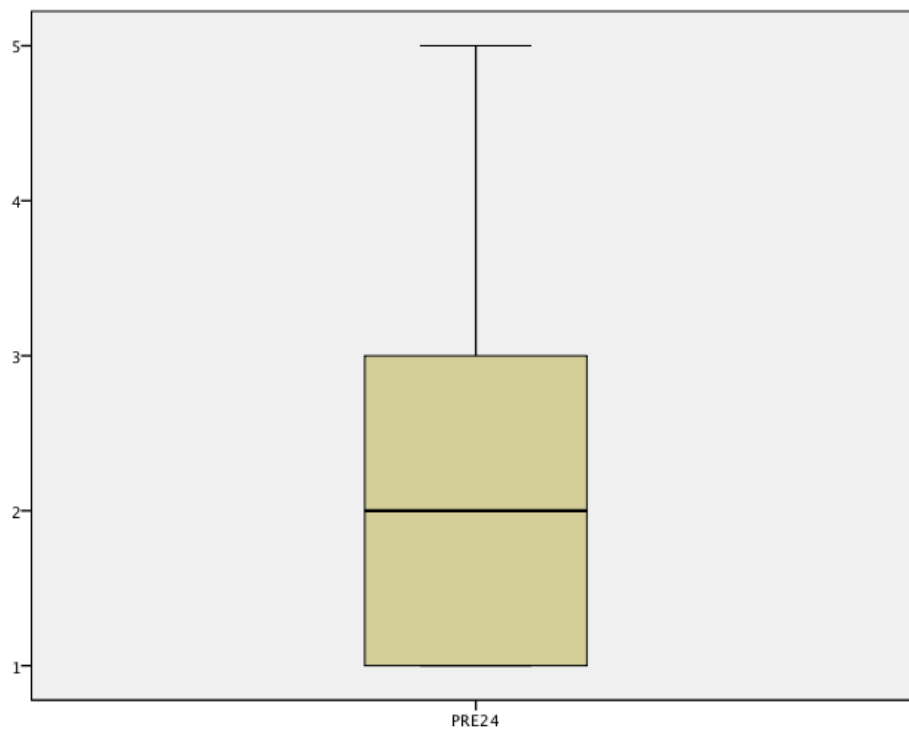
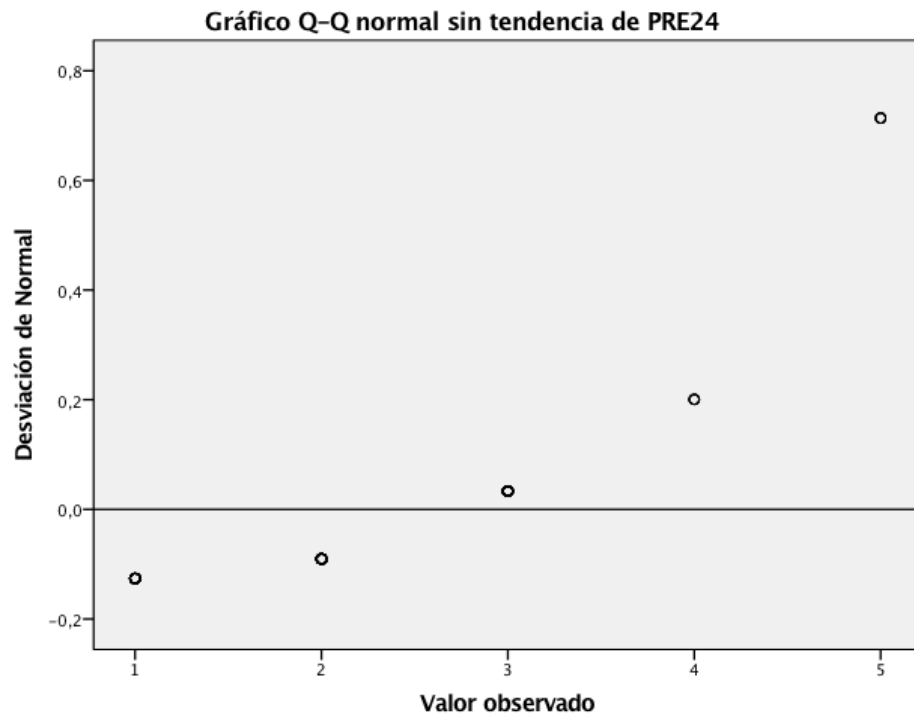
Pruebas de normalidad

Kolmogorov-Smirnov ^a			Shapiro-Wilk			
	Estadístic o	gl	Sig.	Estadístic o	gl	Sig.
PRE24	,197	99	,000	,861	99	,000

a. Corrección de significación de Lilliefors

PRE24





EXAMINE VARIABLES=POST24

```

/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 24	56	56,0%	44	44,0%	100	100,0%

Descriptivos

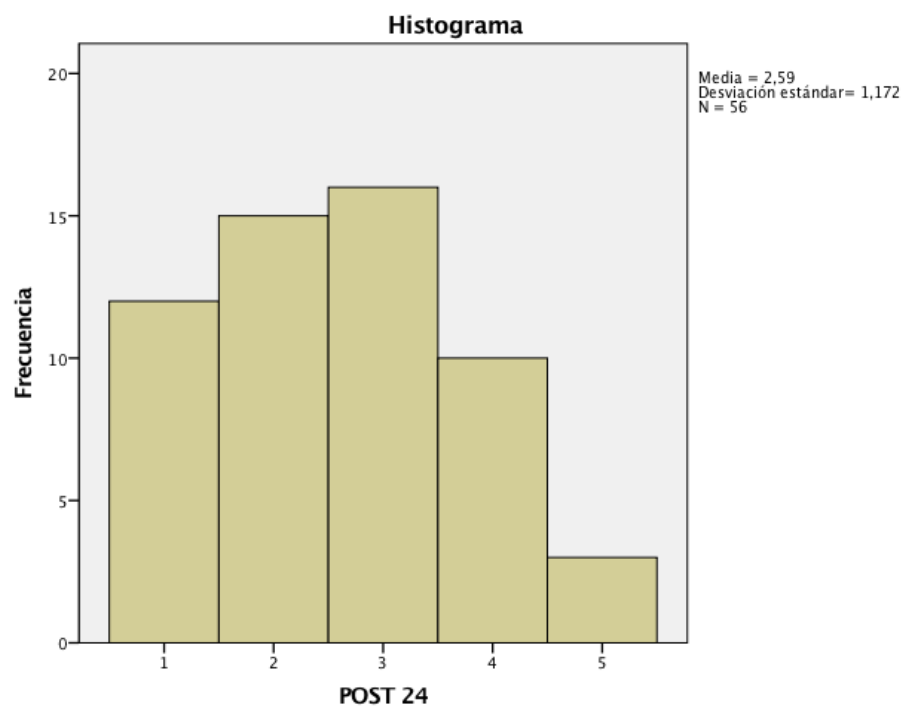
			Estadístico	Error estándar
POST 24	Media		2,59	,157
	95% de intervalo de confianza para la media	Límite inferior	2,28	
		Límite superior	2,90	
	Media recortada al 5%		2,54	
	Mediana		3,00	
	Varianza		1,374	
	Desviación estándar		1,172	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		,234	,319
	Curtosis		-,809	,628

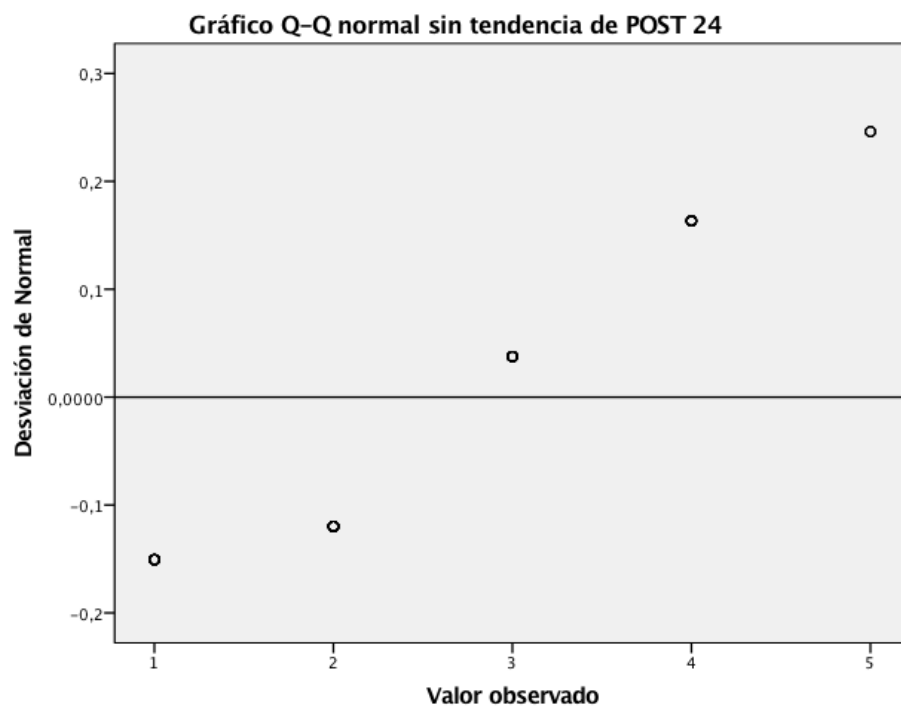
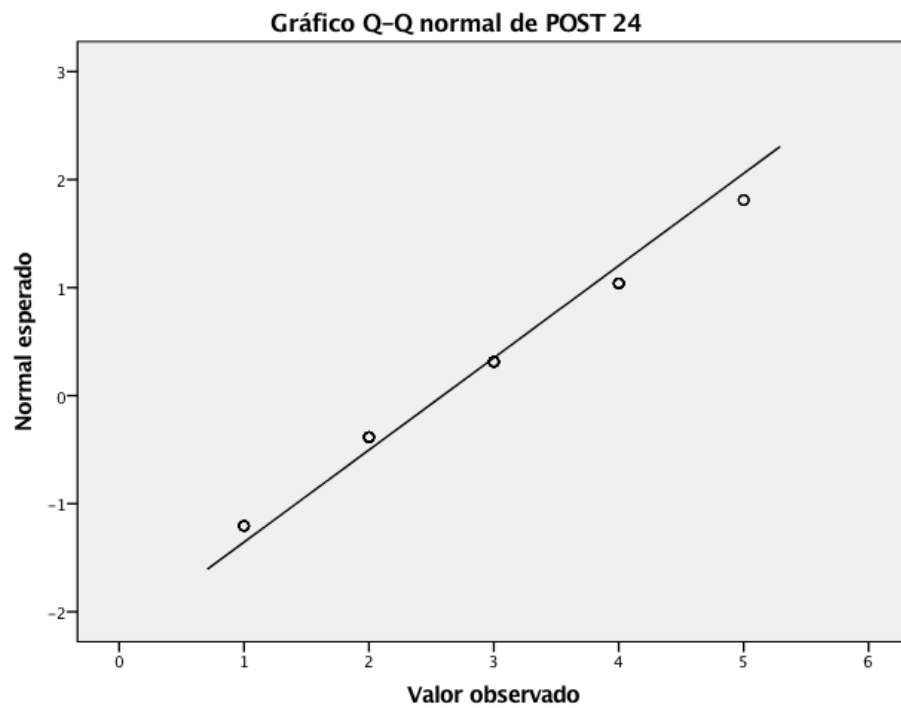
Pruebas de normalidad

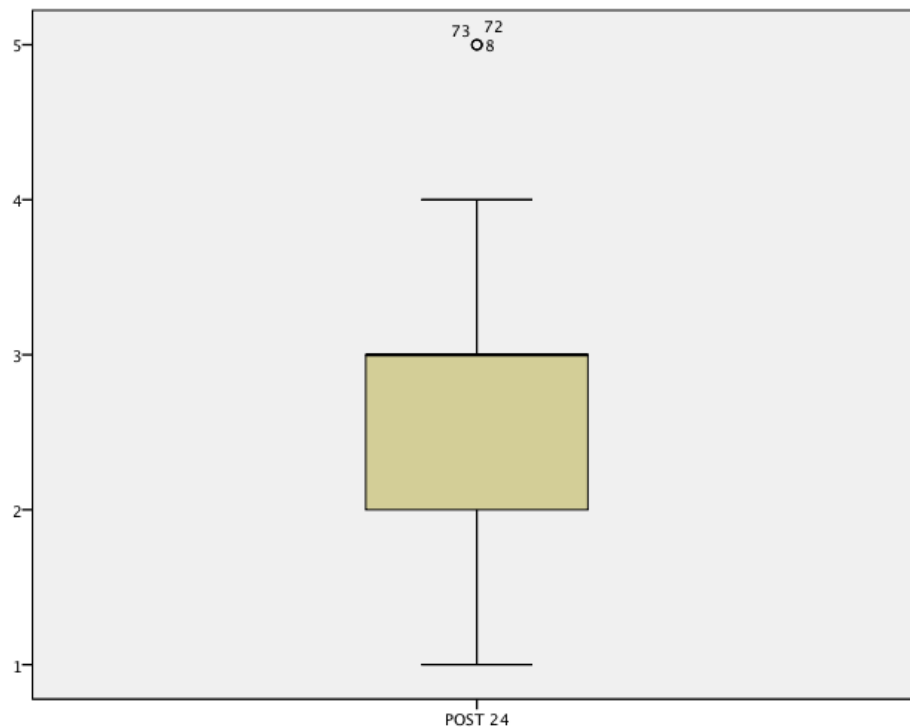
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 24	,175	56	,000	,905	56	,000

a. Corrección de significación de Lilliefors

POST 24







NPAR TESTS

/WILCOXON=PRE24 WITH POST24 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE24	99	2,21	1,043	1	5
POST 24	56	2,59	1,172	1	5

Prueba de rangos con signo de Wilcoxon

Rangos

		N	Rango promedio	Suma de rangos
POST 24 - PRE24	Rangos negativos	14 ^a	18,89	264,50
	Rangos positivos	25 ^b	20,62	515,50
	Empates	16 ^c		
	Total	55		

a. POST 24 < PRE24

b. POST 24 > PRE24

c. POST 24 = PRE24

Estadísticos de prueba^a

POST 24 - PRE24	
Z	-1,811 ^b
Sig. asintótica (bilateral)	,070

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
EXAMINE VARIABLES=PRE25
  /PLOT BOXPLOT HISTOGRAM NPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
PRE25	100	100,0%	0	0,0%	100	100,0%

Descriptivos

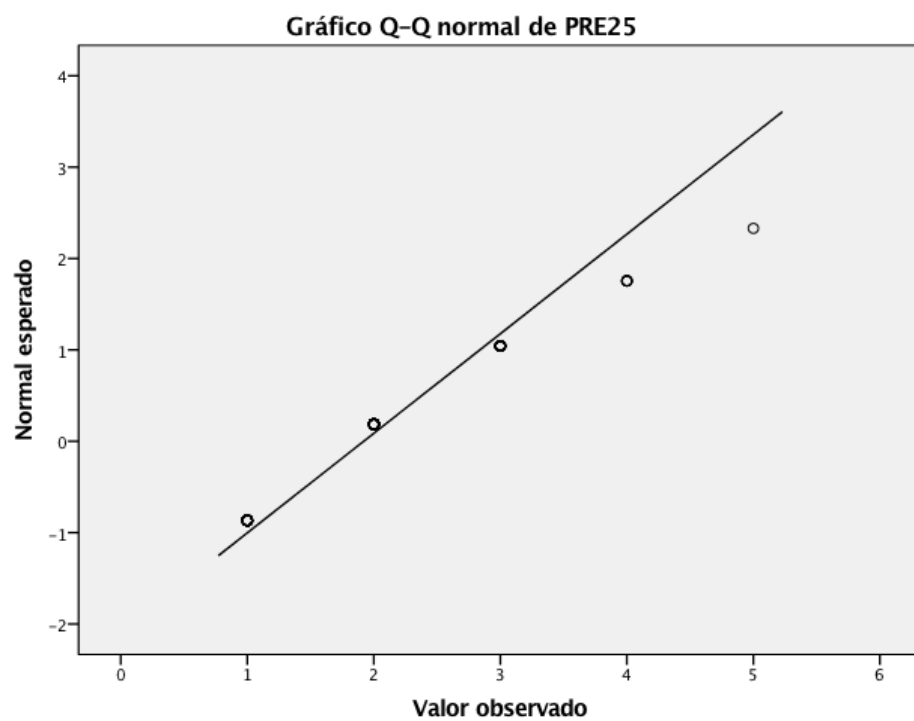
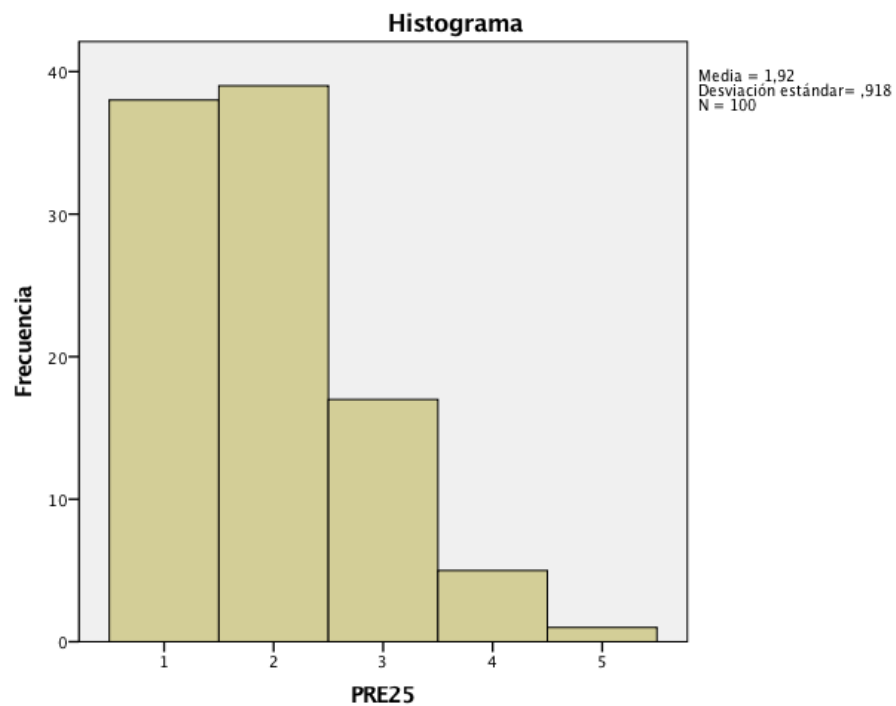
			Estadístico	Error estándar
PRE25	Media		1,92	,092
	95% de intervalo de confianza para la media	Límite inferior	1,74	
		Límite superior	2,10	
	Media recortada al 5%		1,84	
	Mediana		2,00	
	Varianza		,842	
	Desviación estándar		,918	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		1	
	Asimetría		,881	,241
	Curtosis		,448	,478

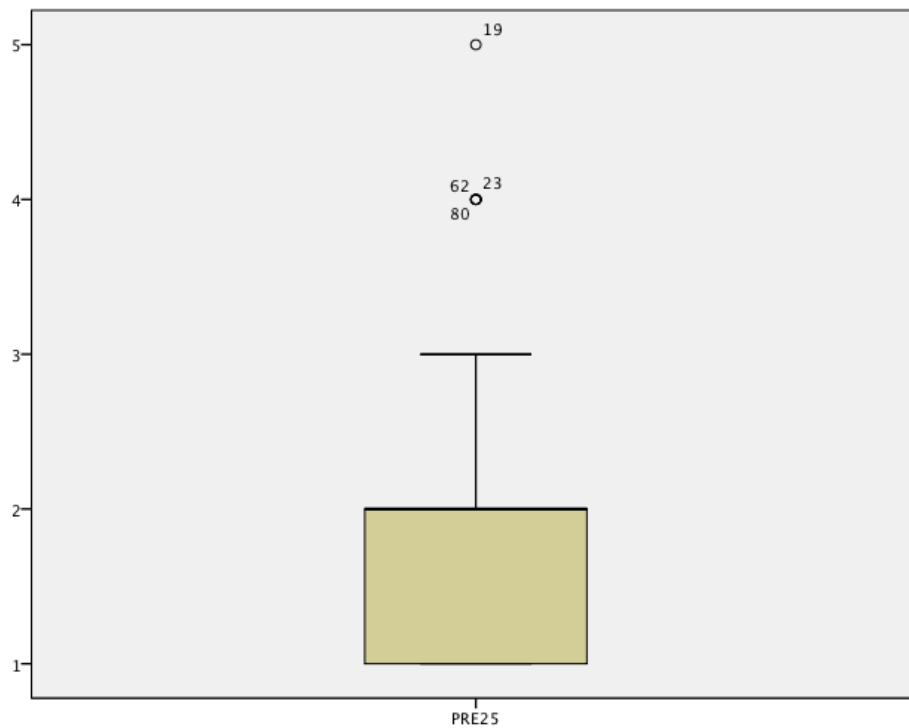
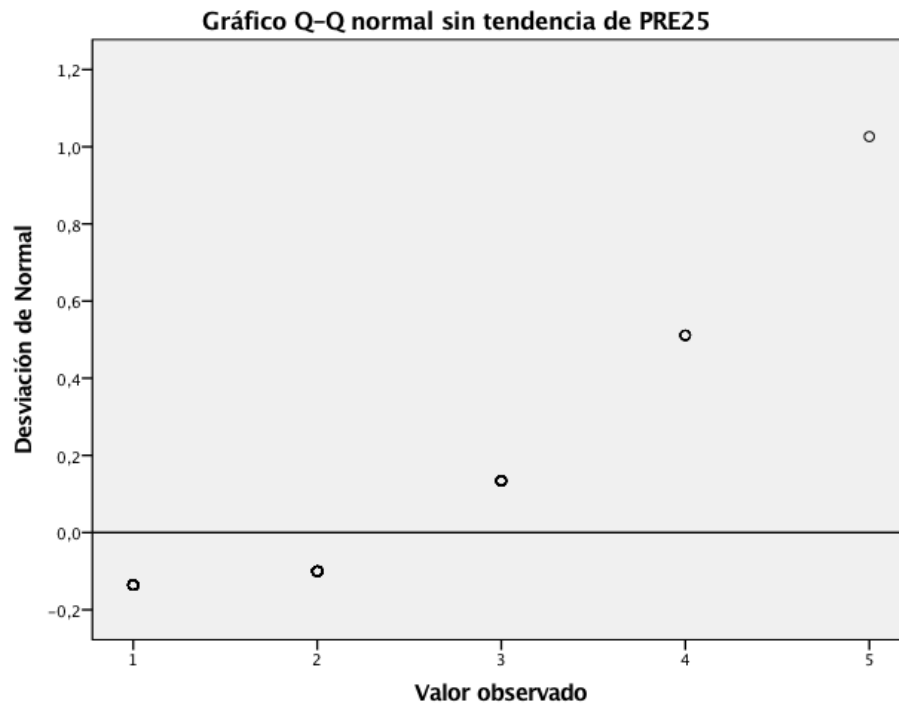
Pruebas de normalidad

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístico	gl	Sig.	Estadístico	gl	Sig.
	o	gl	Sig.	o	gl	Sig.
PRE25	,235	100	,000	,828	100	,000

a. Corrección de significación de Lilliefors

PRE25





```
EXAMINE VARIABLES=POST25  
/PLOT BOXPLOT HISTOGRAM NPLOT
```

```

/COMPARE GROUPS
/STATISTICS DESCRIPTIVES
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.

```

Explorar

Resumen de procesamiento de casos

	Válido		Casos Perdidos		Total	
	N	Porcentaje	N	Porcentaje	N	Porcentaje
POST 25	83	83,0%	17	17,0%	100	100,0%

Descriptivos

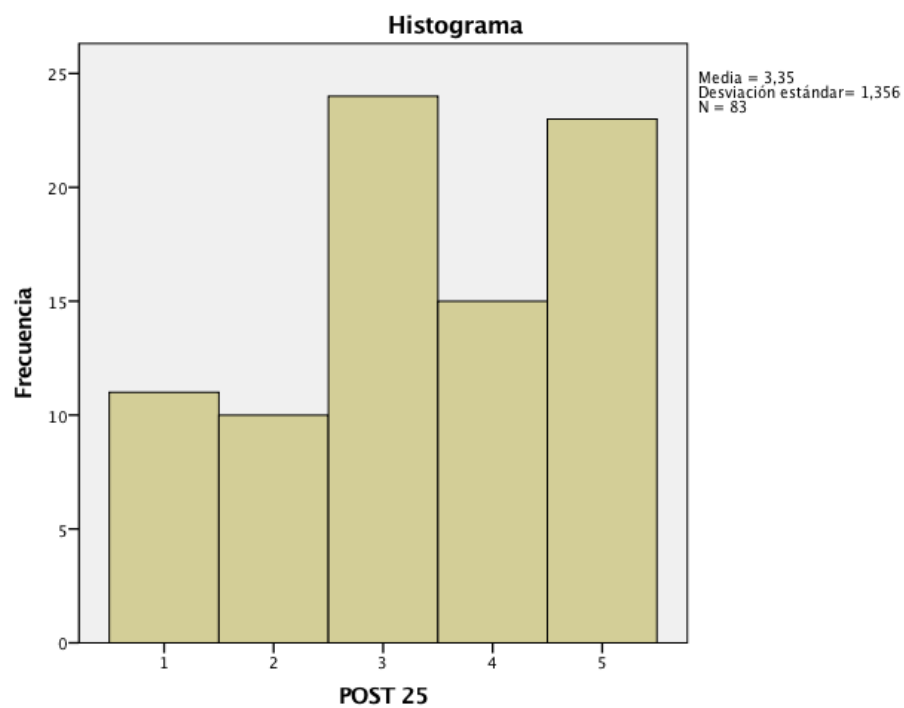
			Estadístico	Error estándar
POST 25	Media		3,35	,149
	95% de intervalo de confianza para la media	Límite inferior	3,05	
		Límite superior	3,65	
	Media recortada al 5%		3,39	
	Mediana		3,00	
	Varianza		1,840	
	Desviación estándar		1,356	
	Mínimo		1	
	Máximo		5	
	Rango		4	
	Rango intercuartil		3	
	Asimetría		-,304	,264
	Curtosis		-1,012	,523

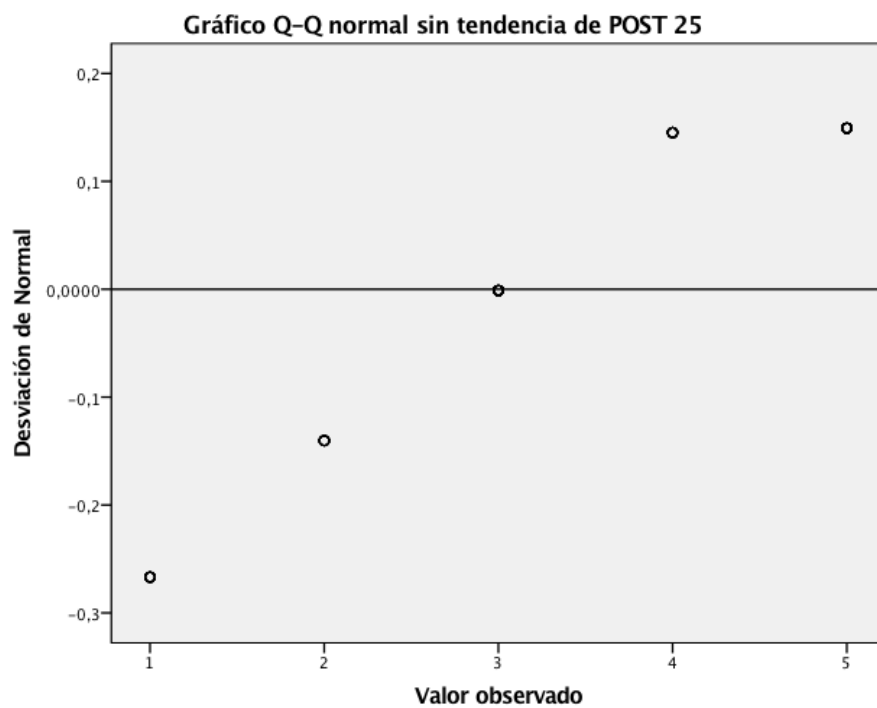
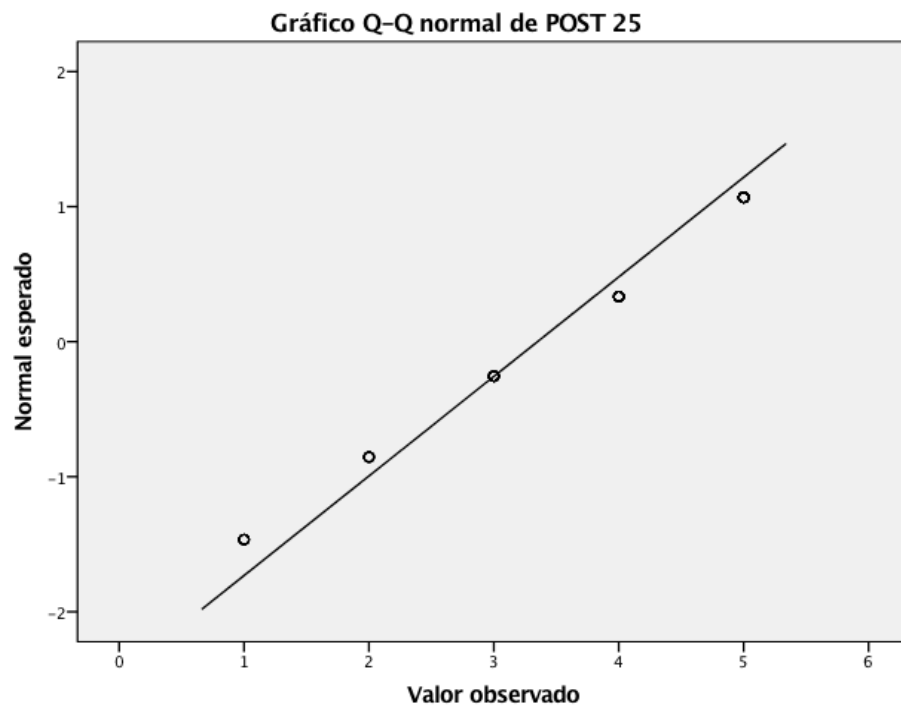
Pruebas de normalidad

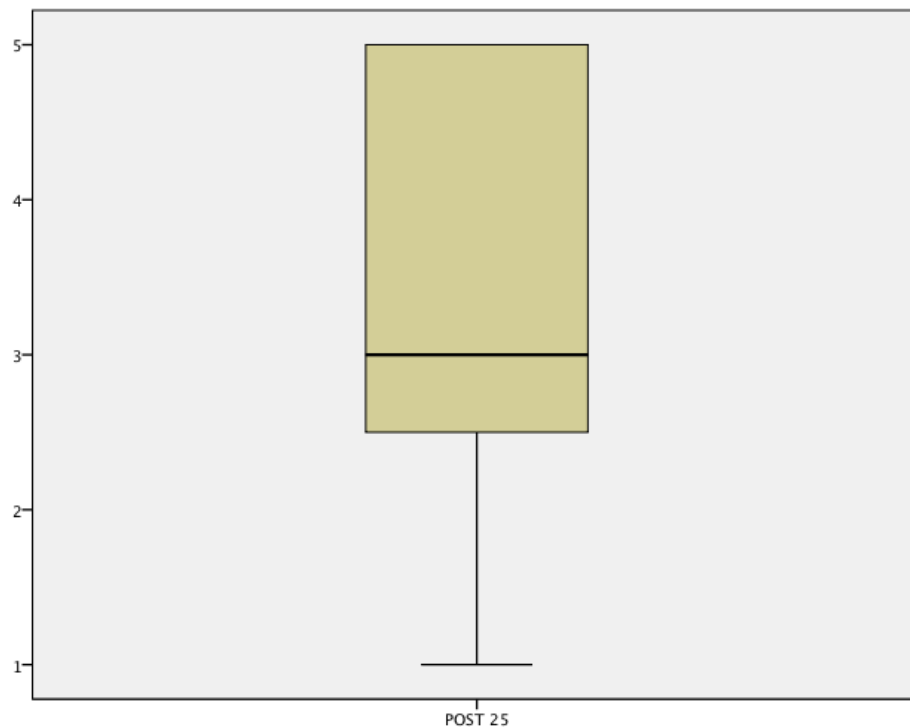
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Estadístic			Estadístic		
	o	gl	Sig.	o	gl	Sig.
POST 25	,165	83	,000	,881	83	,000

a. Corrección de significación de Lilliefors

POST 25







NPAR TESTS

/WILCOXON=PRE25 WITH POST25 (PAIRED)

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS.

Pruebas NPar

Estadísticos descriptivos

	N	Media	Desviación estándar	Mínimo	Máximo
PRE25	100	1,92	,918	1	5
POST 25	83	3,35	1,356	1	5

Prueba de rangos con signo de Wilcoxon

Rangos

	N	Rango promedio	Suma de rangos
--	---	-------------------	-------------------

POST 25 - PRE25	Rangos negativos	12 ^a	19,50	234,00
	Rangos positivos	58 ^b	38,81	2251,00
	Empates	13 ^c		
	Total	83		

a. POST 25 < PRE25

b. POST 25 > PRE25

c. POST 25 = PRE25

Estadísticos de prueba^a

POST 25 -
PRE25

Z	-5,966 ^b
Sig. asintótica (bilateral)	,000

a. Prueba de rangos con signo de Wilcoxon

b. Se basa en rangos negativos.

```
DESCRIPTIVES VARIABLES=G1 G2 G3 G4 G5 G6 G7 G8 G9 G10 G11
G12 G13 G14 G15 G16 G17 G18 G19
/STATISTICS=MEAN STDDEV MIN MAX.
```

Descriptivos

Estadísticos descriptivos

	N	Mínimo	Máximo	Media	Desviación estándar
G1	99	1	5	3,32	1,276
G2	100	1	5	3,77	,930
G3	100	1	5	3,85	,947
G4	100	1	5	3,06	1,033
G5	100	1	5	3,81	,940
G6	100	1	5	4,10	,835

G7	100	2	5	3,87	,849
G8	99	1	5	4,11	,913
G9	100	2	5	4,24	,818
G10	100	1	5	3,76	1,006
G11	100	1	5	3,31	1,143
G12	99	1	5	3,95	,962
G13	100	1	5	3,42	1,182
G14	100	1	5	3,84	,918
G15	100	1	5	3,45	,978
G16	100	1	5	3,97	,926
G17	100	1	5	3,67	1,006
G18	100	1	5	3,15	1,114
G19	100	1	5	3,04	1,222
N válido (por lista)	97				