VIRTUAL REALITY-BASED APPARATUS FOR SELF-DIRECTED PRACTICE OF MEDICATION NURSING

CROSS REFERENCE TO RELATED APPLICATION

The present application claims priority to Korean Patent Application No. 10-2022-0149575, filed November 10, 2022, the entire contents of which is incorporated herein for all purposes by this reference.

BACKGROUND OF THE INVENTION

Field of the Invention

The present disclosure relates to a virtual reality-based apparatus for self-directed practice of medication nursing. More particularly, the present disclosure relates to a virtual reality-based apparatus for self-directed practice of medication nursing, the apparatus being capable of enabling nursing students to complete practice education for trained nursing through repeated training in fundamental nursing skills that are nurses' main duties.

Description of the Related Art

Basic nursing is a discipline that consists of theory and practice, and is a curriculum subject that educates students

entering nursing science about the meaning and concept of basic nursing and to apply the same to clinical work.

Through basic nursing practice, the students are educated to develop fundamental and basic nursing competency required to solve patients' health problems in the medical field. After becoming a nurse, the nursing competency is used to solve patients' health problems. The basic nursing competency considers formation of correct attitudes and habits as important results of learning so that problem solving through trial and error and repeated training in nursing skills enable the students to automatically master the nursing skills without conscious efforts.

The basic nursing practice has been taught in a manner in which, due to the characteristics of the curriculum subject, a teacher observes a learner practicing the nursing skills one-on-one. In addition, the basic nursing practice includes a passive type of practice process in which a model is targeted in a practice room or training in fragmentary nursing skills is repeated. In addition, in most universities, the opportunities for practicing nursing skills given to the students are inevitably limited because of the lack of practice places, limited access to patients, the shortage of teaching staff, and the lack of practice credits and time. Such a situation makes the students think that they do not understand nursing science properly. Because of insufficient nursing knowledge and

skills, the students experience loss of self-confidence, severe tension and stress, and poor adaptation to the clinical environment.

In addition, patients and guardians in hospitals have refused to experience practice by unskilled students because the patients' and guardians' knowledge levels of medical information have improved and the demand for high-quality nursing services has increased. Therefore, if the universities do not cultivate the students having accurate basic nursing skills, this will also affect maladjustment when the students become new nurses.

In the meantime, in a conventional apparatus for self-directed practice of medication nursing, a pre-stored video is played by pressing a controller serving as a laser pointer, so a learner has to view the video and learn a medication nursing process.

The foregoing is intended merely to aid in the understanding of the background of the present disclosure, and is not intended to mean that the present disclosure falls within the purview of the related art that is already known to those skilled in the art.

Documents of Related Art

(Patent Document 1) KR 10-1915621 B1; and

(Patent Document 2) KR 10-2071606 B1.

SUMMARY OF THE INVENTION

The present disclosure is directed to providing a virtual reality-based apparatus for self-directed practice of medication nursing, wherein a learner receives repeated training in fundamental nursing skills that are nurses' main duties through a virtual reality medication nursing program capable of movement recognition and a virtual reality device, so that practice education for trained nursing is completed.

In addition, the present disclosure is directed to providing a virtual reality-based apparatus for self-directed practice of medication nursing, wherein as in real world, a learner controls a 3D object in real time with his or her hands and has practice through a virtual reality device, so that practice education for acquiring knowledge-based skills and improving familiarity through repeated training is realized in a non-face-to-face environment.

In addition, the present disclosure is directed to providing a virtual reality-based apparatus for self-directed practice of medication nursing, wherein using a virtual reality technology capable of recognizing movements in real time, a learner makes daily movements of pressing, holding, pulling, and releasing a 3D object with his or her hands, so that realistic practice situations in a virtual reality environment

are adjusted.

In addition, the present disclosure is directed to providing a virtual reality-based apparatus for self-directed practice of medication nursing, wherein a learner is enabled to actively recognize a practice environment and make decisions and actions on the environment, thereby achieving learning goals of the practice education.

In addition, the present disclosure is directed to providing a virtual reality-based apparatus for self-directed practice of medication nursing, wherein an image of a real environment taken with a 360-degree camera is applied as a background screen of virtual reality content, so that a learner feels as if practicing in his or her practice room anytime and anywhere.

According to the present disclosure, there is provided a virtual reality-based apparatus for self-directed practice of medication nursing, the apparatus including: a computer 10 in which a virtual reality medication nursing program 15 is installed; a virtual reality device 11 configured to be worn on a learner's face, and display data output by the virtual reality medication nursing program 15 to the learner; and a Leap Motion 12 provided in front of the virtual reality device 11, and configured to detect the learner's hand movements through an infrared camera, wherein the virtual reality medication nursing program 15 includes: a storage part 16 in

which a virtual practice interface 30 and a plurality of correct answers for a medication nursing process are stored; a reception part 17 configured to receive hand movement data detected by the Leap Motion 12; a data processing part 18 configured to process the hand movement data received by the reception part 17; an output part 19 configured to output hand movement processed data resulting from processing by the data processing part 18 to a virtual practice screen; a score calculation part 20 configured to analyze data input by the learner for a question presented on the virtual practice screen, and calculate the learner's score; and a transmission part 21 configured to transmit output data output by the output part 19 and score data of the learner calculated by the score calculation part 20 to the virtual reality device 11.

In addition, the virtual practice interface 30 may include: a login interface 31 for inputting the learner's ID to log in; a selection interface 32 for selecting a practice item 32a to be practiced; an advance preparation interface 35 for preparing medication nursing in advance according to a practice sequence; and a medication nursing interface 60 for practicing a process of injection using a syringe product 48a into an injection site of a patient model 62b, wherein the patient model 62b may be a 3D model of a patient and the syringe product 48a may be a 3D model of a syringe, and the syringe product 48a may include: a body 48b formed in a hollow cylindrical shape, and in which

medicine is received; an inner tube 48c provided inside the body 48b, and formed to be movable in a longitudinal direction of the body 48b; and a needle 48d provided at a distal end of the body 48b, and inserted into a skin of the patient model 62b, and the selection interface 32 may include: a plurality of the practice items 32a provided in a middle of the selection interface 32; practice icons 32b provided grippable below the practice items 32a; and a selection icon 32c provided above the practice items 32a, and at which one of the practice icons 32b is placed, the one practice icon 32b being gripped, wherein the practice items 32a include intramuscular injection, intravenous injection, endotracheal suction, gavage, blood transfusion, subcutaneous injection, and intradermal injection items, and the advance preparation interface 35 may include: a preparation sequence interface 36 for checking an advance preparation sequence in advance according to the practice item 32a selected in the selection interface 32; a hand hygiene interface 40 for practicing virtual hand hygiene; a prescription reading interface 45 for reading a medication prescription and medication rules individually; a medicine preparation interface 46 for selecting a plurality of article objects required for medicine preparation; a medication preparation interface 49 for injecting a medicine object required for medication nursing into the syringe product 48a according to a preset dose and method; and an article preparation interface 50 for selecting a

plurality of article objects required for medication nursing preparation.

In addition, the preparation sequence interface 36 may include: a plurality of advance preparation items 36a provided on the right of the preparation sequence interface 36; protocol icons 36b provided to the right of the advance preparation items 36a, and grippable according to the advance preparation items 36a; and a plurality of number icons 36c provided to the right of the protocol icons 36b, and at which the protocol icons 36b gripped are placed in order, wherein the advance preparation items 36a may include medication prescription and medication rule reading, medicine-in-syringe measurement, intramuscular injection medicine preparation, hand hygiene, ampule opening, and article preparation items, and the hand hygiene interface 40 may include: a hand hygiene sequence interface 42 for checking a hand hygiene sequence in advance; a hand hygiene practice interface 43 for practicing virtual hand hygiene according to the hand hygiene sequence; and an article selection interface 44 for selecting a plurality of article objects required for medication nursing, and the hand hygiene sequence interface 42 may include: a plurality of hand hygiene pictures 42a provided at an upper portion of the hand hygiene sequence interface 42; hand hygiene protocols 42b provided below the hand hygiene pictures 42a, and grippable according to the hand hygiene pictures 42a; and preparation number icons 61c

provided to the right of the hand hygiene protocols 42b, and at which the gripped hand hygiene protocols 42b are placed, wherein the hand hygiene pictures 42a may include pictures of nails, thumbs, the other fingers, both hands put together, and palms, and the hand hygiene practice interface 43 may include: a washbasin object 43a provided in a middle of the hand hygiene practice interface 43; a tap object 43b provided in a middle of the washbasin object 43a, and through which a water object for washing a hand model is discharged; a soap object 43c provided at a side of the washbasin object 43a, and for washing the hand model; a hand sanitizer object 43d provided next to the soap object 43c, and for disinfecting the hand model; and a hand towel receiving part 43e provided to the right of the washbasin object 43a, and grippable such that a hand towel object 43f for removing the water object is discharged, wherein the tap object 43b may enter an open state when touched in a closed state, and may enter the closed state when touched in the open state, and wherein in the hand hygiene practice interface 43, hand hygiene practice may be performed using the water object and the soap object 43c or using the hand sanitizer object 43d until an actual hand hygiene time period reaches or exceeds a preset reference hand hygiene time period, and the actual hand hygiene time period may be measured as a time interval from a time point of the first touch of the tap object 43b to a time point of the first grip of the hand towel object 43f.

In addition, the prescription reading interface 45 may include: a laptop computer object 45a provided in a middle of the prescription reading interface 45, and touchable such that the medication prescription and the medication rules are individually read; a medication card 45b provided at a side of the laptop computer object 45a, and into which input is enabled according to the medication prescription and the medication rules; and a barcode output button 45c provided at a lower portion of the medication card 45b, and clickable such that the medication card 45b in which input is completed is output, wherein the medication rules may include a subject registration number, a subject name, a drug name, a dose, an administration route, and administration time, and the medicine preparation interface 46 may include a medicine interface 48 in which a plurality of the syringe products 48a and ampule objects 48f selectable when clicked are provided, each of the syringe products 48a remains wrapped in a wrapper product 48e, and each of the ampule objects 48f has a top provided with an ampule top object 48g removable by being snapped backward, and a medicine object is received inside each of the ampule objects 48f, and a side of the medication preparation interface 49 may be provided with an alcohol box 49a in which an alcohol swab object 49b for covering and disinfecting the ampule top object 48g is received, and the medication preparation interface 49 may include: a general waste bin object 49c provided at a lower portion of the

medication preparation interface 49, and for disposing of a wrapper object; a medical waste bin object 49d provided next to the general waste bin object 49c, and for disposing of the alcohol swab object 49b; and a damaging waste bin object 49e provided next to the medical waste bin object 49d, and for disposing of the ampule top object 48g, and in a middle of the article preparation interface 50, the plurality of article objects required for medication nursing preparation and selectable when clicked may be provided, and in the article preparation interface 50, each of the article objects may be selected when clicked once, and selection of each of the article objects may be canceled when each of the article objects is clicked twice, and when selection of the article objects is completed, the article objects selected and the article objects insufficient may be individually visually displayed.

In addition, the medication nursing interface 60 may include: a medication sequence interface 61 for checking a medication preparation sequence in advance; a medication interface 62 for practicing medication nursing for the patient model 62b; a nurse introduction interface 63 for introducing a nurse to the patient model 62b; a hand hygiene guide interface 64 for giving guidance on hand hygiene for the patient model 62b; a patient check interface 65 for checking the patient model 62b to be subjected to medication nursing; a curtain

interface 66 for closing a curtain object 66a to protect the patient model's 62b privacy; a bed adjustment interface 67 for adjusting a height of a rail of a bed model 62a; a pain reduction interface 68 for selecting a pain reduction method in injection; an injection site interface 69 for selecting the injection site appropriate for an injection method; a detail interface 70 for selecting a detailed injection site according to the injection site selected in the injection site interface 69; a hand hygiene execution interface 71 for practicing virtual hand hygiene just before medication nursing; a disinfection preparation interface 72 for preparing disinfection for the detailed injection site selected in the detail interface 70; an angle adjustment interface 73 for adjusting an angle of the syringe product 48a; an injection interface 74 for injection using the syringe product 48a into the injection site of the patient model 62b; and a blood regurgitation check interface 75 for checking whether blood flows wrongly into the inner tube 48c of the syringe product 48a.

In addition, the medication sequence interface 61 may include: a plurality of injection preparation items 61a provided on the right of the medication sequence interface 61; injection protocol icons 61b provided to the left of the injection preparation items 61a, and grippable according to the injection preparation items 61a; and a plurality of preparation

number icons 61c provided to the right of the injection protocol icons 61b, and at which the medication preparation protocol icons 36b gripped are placed in order, wherein the injection preparation items 61a may include hand sanitizer-used hand hygiene, medication purpose explanation, curtain-used privacy protection, subject check, nurse introduction, and detailed explanation-to-subject items, and the medication interface 62 may include: the bed model 62a, a 3D model of a bed, provided in a middle of the medication interface 62; and the patient model 62b, a 3D model of a patient, provided on the bed model 62a, and the curtain interface 66 may include: a curtain-opening item 66b provided on the left of the curtain interface 66, and for opening the curtain object 66a; a curtain-closing item 66c provided on the right of the curtain-opening item 66b, and for closing the curtain object 66a; and a curtain icon 66d provided between the curtain-opening item 66b and the curtain-closing item 66c, and movable to the curtain-opening item 66b or the curtain-closing item 66c.

In addition, the injection site interface 69 may include: a plurality of injection method icons 69a provided grippable in a middle of the injection site interface 69, and showing the practice items 32a; box icons 69b provided above the injection method icons 69a, and at which the injection method icons 69a gripped are placed; and a plurality of injection site pictures 69c provided above the box icons 69b, and showing the injection

sites corresponding to the injection method icons 69a placed in the box icons 69b, and the detail interface 70 may include: a detailed picture 70a provided on the left of the detail interface 70, and showing a plurality of injection points to which injection is allowed with respect to one of the injection site pictures 69c; and a guideline box 70b provided to the right of the detailed picture 70a, and for giving guidance on an accurate injection point among the injection points, and the angle adjustment interface 73 may include: a protractor object 73a provided in a middle of the angle adjustment interface 73, and for adjusting an injection angle of the syringe product 48a; a skin cross-section 73b provided below the protractor object 73a, and showing a cross-section of skin of the patient model 62b; and an angle readjustment button 73c provided to the right of the skin cross-section 73b, and clickable to adjust the injection angle of the syringe product 48a again, and the injection interface 74 may have a middle provided with the detailed picture 70a of the injection site for the patient model 62b.

In the virtual reality-based apparatus for self-directed practice of medication nursing according to the present disclosure, a learner receives repeated training in fundamental nursing skills that are nurses' main duties through the virtual reality medication nursing program capable of movement recognition and the virtual reality device, so that practice

education for trained nursing can be completed.

In addition, in the virtual reality-based apparatus for self-directed practice of medication nursing according to the present disclosure, a learner controls a 3D object in real time with his or her hands and has practice through the virtual reality device, so that practice education for acquiring knowledge-based skills and improving familiarity through repeated training can be realized in a non-face-to-face environment.

In addition, in the virtual reality-based apparatus for self-directed practice of medication nursing according to the present disclosure, a learner makes daily movements of pressing, holding, pulling, and releasing a 3D object with his or her hands by using a virtual reality technology capable of recognizing movements in real time, so that realistic practice situations in a virtual reality environment can be adjusted.

In addition, in the virtual reality-based apparatus for self-directed practice of medication nursing according to the present disclosure, an image of a real environment taken with a 360-degree camera is applied as a background screen of virtual reality content, so that a learner can feel as if practicing in his or her practice room anytime and anywhere.

Through this, a learner’s anxiety can be reduced and a sense of belonging can be enhanced, and repeated training in a familiar environment can increase adaptability to practice.

In addition, in the virtual reality-based apparatus for self-directed practice of medication nursing according to the present disclosure, a 360-degree virtual reality background screen can be changed, so that when necessary, preparations for a hospital environment rather than a practice room can be made and training in a space where safety is not ensured can be performed.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objectives, features, and other advantages of the present disclosure will be more clearly understood from the following detailed description when taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a configuration diagram of a virtual reality-based apparatus for self-directed practice of medication nursing according to the present disclosure.

FIG. 2 is a configuration diagram of a virtual reality medication nursing program.

FIG. 3 is a configuration diagram of a virtual practice interface.

FIG. 4 is a configuration diagram of a login interface.

FIG. 5 is a configuration diagram of a selection interface.

FIG. 6 is a configuration diagram of an advance

preparation interface.

FIG. 7 is a configuration diagram of a preparation sequence interface.

FIG. 8 is a configuration diagram of a hand hygiene interface.

FIG. 9 is a configuration diagram of a hand hygiene sequence interface.

FIG. 10 is a configuration diagram of a hand hygiene practice interface.

FIG. 11 is a configuration diagram of a prescription reading interface.

FIG. 12 is a configuration diagram of a medicine interface.

FIG. 13 is a configuration diagram of a medication preparation interface.

FIG. 14 is a configuration diagram of an article preparation interface.

FIG. 15 is a configuration diagram of a medication nursing interface.

FIG. 16 is a configuration diagram of a medication sequence interface.

FIG. 17 is a configuration diagram of a medication interface.

FIG. 18 is a configuration diagram of a curtain interface.

FIG. 19 is a configuration diagram of an injection site

interface.

FIG. 20 is a configuration diagram of a detail interface.

FIG. 21 is a configuration diagram of an angle adjustment interface.

DETAILED DESCRIPTION OF THE INVENTION

Hereinbelow, an exemplary embodiment of the present disclosure will be described in detail with reference to the accompanying drawings. Throughout the drawings, the same reference numerals will refer to the same or like parts.

FIG. 1 is a configuration diagram of a virtual reality-based apparatus 5 for self-directed practice of medication nursing according to the present disclosure.

Referring to FIG. 1, the virtual reality-based apparatus 5 for self-directed practice of medication nursing according to the present disclosure includes a computer 10, a virtual reality device 11, and a Leap Motion 12.

First, in the computer 10, a virtual reality medication nursing program 15 is installed.

In addition, the virtual reality device 11 is worn on a learner's face, and displays data output by the virtual reality medication nursing program 15 to the learner.

In addition, the Leap Motion 12 is provided in front of the virtual reality device 11, and detects the learner's hand

movements through an infrared camera.

FIG. 2 is a configuration diagram of the virtual reality medication nursing program 15.

Referring to FIG. 2, the virtual reality medication nursing program 15 includes a storage part 16, a reception part 17, a data processing part 18, an output part 19, a score calculation part 20, and a transmission part 21.

First, in the storage part 16, a virtual practice interface 30 and a plurality of correct answers for a medication nursing process are stored.

In addition, the reception part 17 receives hand movement data detected by the Leap Motion 12.

In addition, the data processing part 18 processes the hand movement data received by the reception part 17.

In addition, the output part 19 outputs hand movement processed data resulting from processing by the data processing part 18 to a virtual practice screen.

In addition, the score calculation part 20 analyzes data that the learner inputs for a question presented on the virtual practice screen, and calculates the learner's score.

In addition, the transmission part 21 transmits output data output by the output part 19 and score data of the learner calculated by the score calculation part 20 to the virtual reality device 11.

FIG. 3 is a configuration diagram of the virtual practice

interface 30.

Referring to FIG. 3, the virtual practice interface 30 includes a login interface 31, a selection interface 32, an advance preparation interface 35, and a medication nursing interface 60.

First, the login interface 31 is a screen for the learner to input his or her ID to log in.

In addition, the selection interface 32 is a screen for selecting a practice item 32a to be practiced.

In addition, the advance preparation interface 35 is a screen for preparing medication nursing in advance according to a practice sequence.

In addition, the medication nursing interface 60 is a screen for practicing a process of injection using a syringe product 48a into an injection site of a patient model 62b.

Herein, the patient model 62b means a 3D model of a patient, and the syringe product 48a means a 3D model of a syringe.

In addition, the syringe product 48a includes a body 48b, an inner tube 48c, and a needle 48d.

First, the body 48b is formed in a hollow cylindrical shape and extending in the longitudinal direction, and medicine is held inside the body 48b.

In addition, the inner tube 48c is provided inside the body 48b, and is formed to be movable in the longitudinal

direction of the body 48b.

In addition, the needle 48d is provided at the distal end of the body 48b, and is inserted into the skin of the patient model 62b.

FIG. 4 is a configuration diagram of the login interface 31.

Referring to FIG. 4, an ID guide phrase 31a is displayed at the upper portion of the login interface 31. For example, the ID guide phrase 31a may be “Please input your ID (student number or employee number)”.

In addition, at the lower portion of the login interface 31, a plurality of number buttons 31b clickable to input the learner’s ID are provided, and above the number buttons 31b, an ID display part 31c on which the learner’s ID input through the number buttons 31b is displayed is provided.

In addition, in the middle of the login interface 31, a hand model is provided, wherein the hand model is a 3D model of the learner’s hands and moves in real time in association with the learner’s hand movements.

FIG. 5 is a configuration diagram of the selection interface 32.

Referring to FIG. 5, the selection interface 32 includes practice items 32a, practice icons 32b, and a selection icon 32c.

First, a plurality of the practice items 32a are provided

in the middle of the selection interface 32.

Herein, the practice items 32a may include intramuscular injection, intravenous injection, endotracheal suction, gavage, blood transfusion, subcutaneous injection, and intradermal injection items, etc.

In addition, the practice icons 32b are provided grippable below the practice items 32a.

In addition, the selection icon 32c is provided above the practice icons 32b, and one of the practice icons 32b is gripped and placed in the selection icon 32c.

In addition, a guide phrase for the practice item 32a is displayed at the upper portion of the selection interface 32. For example, the selection guide phrase may be “Please select a practice item”.

The learner grips a practice icon 32b in the selection interface 32 and moves the practice icon 32b to the selection icon 32c, thereby selecting a practice item 32a that the learner wants to practice.

FIG. 6 is a configuration diagram of the advance preparation interface 35.

The advance preparation interface 35 includes a preparation sequence interface 36, a hand hygiene interface 40, a prescription reading interface 45, a medicine preparation interface 46, a medication preparation interface 49, and an article preparation interface 50.

First, the preparation sequence interface 36 is a screen for checking an advance preparation sequence in advance according to the practice item 32a selected in the selection interface 32.

In addition, the hand hygiene interface 40 is a screen for practicing virtual hand hygiene.

In addition, the prescription reading interface 45 is a screen for reading a medication prescription and medication rules individually.

In addition, the medicine preparation interface 46 is a screen for selecting a plurality of article objects required for medicine preparation.

In addition, the medication preparation interface 49 is a screen for injecting a medicine object required for medication nursing into the syringe product 48a according to a preset dose and method.

In addition, the article preparation interface 50 is a screen for selecting a plurality of article objects required for medication nursing preparation.

FIG. 7 is a configuration diagram of the preparation sequence interface 36.

Referring to FIG. 7, the preparation sequence interface 36 includes advance preparation items 36a, protocol icons 36b, and number icons 36c.

First, a plurality of the advance preparation items 36a

are provided on the right of the preparation sequence interface 36.

Herein, the advance preparation items 36a may include medication prescription and medication rule reading, medicine-in-syringe measurement, intramuscular injection medicine preparation, hand hygiene, ampule opening, article preparation items, etc.

In addition, the protocol icons 36b are provided to the right of the advance preparation items 36a, and formed grippable by the learner according to the advance preparation items 36a.

In addition, the number icons 36c are provided to the right of the protocol icons 36b, and at which the gripped protocol icons 36b are placed in order.

Herein, the protocol icons 36b are formed in the shape of a filled inverted triangle, and the number icons 36c are formed in the shape of a hollow inverted triangle.

The learner moves the protocol icons 36b to the number icons 36c in order in a practice sequence interface, thereby checking the order of the advance preparation items 36a.

FIG. 8 is a configuration diagram of the hand hygiene interface 40.

Referring to FIG. 8, the hand hygiene interface 40 includes a washbasin button 41, a hand hygiene sequence interface 42, a hand hygiene practice interface 43, and an

article selection interface 44.

First, the washbasin button 41 is a button clickable for switching to the hand hygiene sequence interface 42.

In addition, the hand hygiene sequence interface 42 is a screen for checking a hand hygiene sequence in advance.

In addition, the hand hygiene practice interface 43 is a screen for practicing virtual hand hygiene according to the hand hygiene sequence.

In addition, the article selection interface 44 is a screen for selecting a plurality of article objects required for medication nursing.

FIG. 9 is a configuration diagram of the hand hygiene sequence interface 42.

Referring to FIG. 9, the hand hygiene sequence interface 42 includes hand hygiene pictures 42a, hand hygiene protocols 42b, and preparation number icons 61c.

First, a plurality of the hand hygiene pictures 42a are provided at the upper portion of the hand hygiene sequence interface 42.

Herein, the hand hygiene pictures 42a may include pictures of nails, thumbs, the other fingers, both hands put together, and palms.

In addition, the hand hygiene protocols 42b are provided below the hand hygiene pictures 42a, and formed grippable by the learner according to the hand hygiene pictures 42a.

In addition, the preparation number icons 61c are provided to the right of the hand hygiene protocols 42b, and the hand hygiene protocols 42b gripped are placed in the preparation number icons 61c.

FIG. 10 is a configuration diagram of the hand hygiene practice interface 43.

Referring to FIG. 10, the hand hygiene practice interface 43 includes a washbasin object 43a, a tap object 43b, a soap object 43c, a hand sanitizer object 43d, and a hand towel receiving part 43e.

First, the washbasin object 43a is provided in the middle of the hand hygiene practice interface 43.

In addition, the tap object 43b is provided in the middle of the washbasin object 43a, and a water object for washing the hand model is discharged through the tap object 43b.

When the tap object 43b is touched in a closed state, an open state is entered. When the tap object 43b is touched in the open state, the closed state is entered.

In addition, the soap object 43c is provided at a side of the washbasin object 43a, and is used for washing the hand model.

In addition, the hand sanitizer object 43d is provided next to the soap object 43c, and is used for disinfecting the hand model.

In addition, the hand towel receiving part 43e is provided

to the right of the washbasin object 43a, and is formed grippable such that a hand towel object 43f for removing the water object is discharged.

In addition, in the hand hygiene practice interface 43, a hand hygiene guide phrase 43g is displayed in words.

Herein, the hand hygiene guide phrase 43g may be "You will perform hand hygiene for at least 30 seconds. When the hands overlap, one hand may be invisible. Do not be alarmed, please continue. If you hold the hand towel, hand hygiene time period measurement ends".

In the hand hygiene practice interface 43, the learner may use the water and the soap object 43c or the hand sanitizer object 43d to practice hand hygiene until the learner's actual hand hygiene time period reaches or exceeds a reference hand hygiene time period.

Herein, the learner's actual hand hygiene time period is measured as a time interval from a time point of the first touch of the tap object 43b to a time point of the first grip of the hand towel object 43f.

In addition, the reference hand hygiene time period may be set to 30 seconds.

Herein, the learner's actual hand hygiene time period is stored in the storage part 16, and when the program ends, the learner may read the learner's actual hand hygiene time period.

In addition, in the hand hygiene practice interface 43,

the learner may pull out the hand towel object 43f provided to the right of the tap object 43b and may remove the water on the hand model.

In addition, in the hand hygiene practice interface 43, the learner may pull out the hand towel object 43f once more and may then click the tap object 43b to lock the tap object 43b.

This is to prevent re-contamination of the hand model that has been thoroughly washed or disinfected.

FIG. 11 is a configuration diagram of the prescription reading interface 45.

Referring to FIG. 11, the prescription reading interface 45 includes a laptop computer object 45a, a medication card 45b, and a barcode output button 45c.

First, the laptop computer object 45a is provided in the middle of the prescription reading interface 45, and is formed touchable such that the medication prescription and the medication rules are individually read.

Herein, the medication rules include a subject registration number, a subject name, a drug name, a dose, and an administration route and time.

In addition, the medication card 45b is provided at a side of the laptop computer object 45a, and is formed such that the learner is capable of providing input according to the medication prescription and the medication rules.

In addition, the barcode output button 45c is provided at the lower portion of the medication card 45b, and is formed clickable such that the medication card 45b in which input is completed is output.

In the meantime, the medicine preparation interface 46 includes a medicine preparation button 47 and a medicine interface 48.

First, the medicine preparation button 47 is a button for switching to the medicine interface 48 required for medicine preparation of medication nursing in response to clicking.

FIG. 12 is a configuration diagram of the medicine interface 48.

Referring to FIG. 12, in the middle of the medicine interface 48, a plurality of the syringe products 48a and ampule objects 48f selectable when clicked are provided.

Herein, a syringe product 48a remains wrapped in a wrapper product 48e. In addition, at the top of an ampule object 48f, an ampule top object 48g removable by being snapped backward is provided, and a medicine object is received inside the ampule object 48f.

Herein, in the medicine interface 48, when a syringe product 48a or an ampule object 48f is clicked once, the syringe product 48a or the ampule object 48f may be selected.

In addition, in the medicine interface 48, when a syringe product 48a or an ampule object 48f is clicked twice, selection

of the syringe product 48a or the ampule object 48f may be canceled.

FIG. 13 is a configuration diagram of the medication preparation interface 49.

Referring to FIG. 13, an alcohol box 49a is provided at a side of the medication preparation interface 49, and in the alcohol box 49a, an alcohol swab object 49b for covering and disinfecting an ampule top object 48g is received.

In addition, the medication preparation interface 49 includes a general waste bin object 49c, a medical waste bin object 49d, and a damaging waste bin object 49e.

First, the general waste bin object 49c is provided at the lower portion of the medication preparation interface 49, and is used for disposing of a wrapper object.

In addition, the medical waste bin object 49d is provided next to the general waste bin object 49c, and is used for disposing of the alcohol swab object 49b.

In addition, the damaging waste bin object 49e is provided next to the medical waste bin object 49d, and is used for disposing of the ampule top object 48g.

In addition, at the upper portion of the medication preparation interface 49, a medication preparation guide phrase 49f is displayed in words.

Herein, the medication preparation guide phrase 49f is as follows.

1) Dispose of the syringe wrapper into the general waste bin.

2) Cover the ampule top with the alcohol swab, and snap the ampule top backward to remove.

3) Dispose of the used alcohol swab into the medical waste bin, and the ampule top into the damaging waste bin.

4) Now, shall we prepare the medicine into the syringe as prescribed?

5) Pull the syringe inner tube to draw out the medicine by the prescribed dose, and then press the arrow button.

6) Dispose of the used ampule into the damaging waste bin.

FIG. 14 is a configuration diagram of the article preparation interface 50.

Referring to FIG. 14, in the middle of the article preparation interface 50, a plurality of article objects selectable when clicked are provided.

Herein, in the article preparation interface 50, when an article object is clicked once, the article object may be selected.

In addition, in the article preparation interface 50, when an article object is clicked twice, selection of the article object may be canceled.

In addition, in the article preparation interface 50, when selection of an article object is completed, the selected article object and insufficient article objects are

individually visually displayed.

FIG. 15 is a configuration diagram of the medication nursing interface 60.

Referring to FIG. 15, the medication nursing interface 60 includes a medication sequence interface 61, a medication interface 62, a nurse introduction interface 63, a hand hygiene guide interface 64, a patient check interface 65, a curtain interface 66, a bed adjustment interface 67, a pain reduction interface 68, an injection site interface 69, a detail interface 70, a hand hygiene execution interface 71, a disinfection preparation interface 72, an angle adjustment interface 73, an injection interface 74, and a blood regurgitation check interface 75.

First, the medication sequence interface 61 is a screen for checking a medication preparation sequence in advance.

In addition, the medication interface 62 is a screen for practicing medication nursing for the patient model 62b.

In addition, the nurse introduction interface is a screen for introducing a nurse to the patient model 62b.

Herein, in the middle of the nurse introduction interface 63, a nurse introduction phrase is displayed in words. For example, the nurse introduction phrase may be “Hello, this is the nurse in charge, Kanho Lee”.

In addition, the hand hygiene guide interface 64 is a screen for giving guidance on hand hygiene for the patient

model 62b.

Herein, in the middle of the hand hygiene guide interface 64, a hand hygiene guide phrase 43g is displayed in words. For example, the hand hygiene guide phrase 43g may be "You will perform hand hygiene first to prevent infection".

In addition, the patient check interface 65 is a screen for checking the patient model 62b to be subjected to medication nursing.

Herein, in the middle of the patient check interface 65, a patient check guide phrase 65a is displayed in words. For example, the patient check guide phrase 65a may be "What is your name? Are you Tongmyong Kim?".

In addition, the curtain interface 66 is a screen for closing a curtain object 66a to protect the patient model 62b's privacy.

In addition, the bed adjustment interface 67 is a screen for adjusting the height of a rail of a bed model 62a.

Herein, in the middle of the bed adjustment interface 67, a bed rail guide phrase 67a is displayed in words. For example, the bed rail guide phrase 67a may be "I will lower the bed rail".

In addition, the pain reduction interface 68 is a screen for selecting a pain reduction method in injection.

In addition, the injection site interface 69 is a screen for selecting an injection site appropriate for an injection

method.

In addition, the detail interface 70 is a screen for selecting a detailed injection site according to the injection site selected in the injection site interface 69.

In addition, the hand hygiene execution interface 71 is a screen for practicing virtual hand hygiene just before medication nursing.

Specifically, the hand sanitizer object 43d for hand disinfection is provided at a side of the hand hygiene execution interface 71.

In addition, the disinfection preparation interface 72 is a screen for preparing disinfection for the detailed injection site selected in the detail interface 70.

In the meantime, the alcohol box 49a in which the alcohol swab object 49b for disinfecting the injection site is received is provided at a side of the disinfection preparation interface 72.

In addition, the angle adjustment interface 73 is a screen for adjusting the angle of the syringe product 48a.

In addition, the injection interface 74 is a screen for injection using the syringe product 48a into the injection site of the patient model 62b.

In addition, the blood regurgitation check interface 75 is a screen for checking whether blood flows wrongly into the inner tube 48c of the syringe product 48a.

FIG. 16 is a configuration diagram of the medication sequence interface 61.

Referring to FIG. 16, the medication sequence interface 61 includes injection preparation items 61a, injection protocol icons 61b, and preparation number icons 61c.

First, a plurality of the injection preparation items 61a are provided on the right of the medication sequence interface 61.

Herein, the injection preparation items 61a may include hand sanitizer-used hand hygiene, medication purpose explanation, curtain-used privacy protection, subject check, nurse introduction, detailed explanation-to-subject items, etc.

In addition, the injection protocol icons 61b are provided to the left of the injection preparation items 61a, and formed grippable according to the injection preparation items 61a.

In addition, a plurality of the preparation number icons 61c are provided to the right of the injection protocol icons 61b, and at which the gripped medication preparation protocol icons 36b are placed in order.

Herein, the injection protocol icons 61b are formed in the shape of a filled inverted triangle, and the preparation number icons 61c are formed in the shape of a hollow inverted triangle.

The learner moves the injection protocol icons 61b to the preparation number icons 61c in order in the medication sequence interface 61, thereby checking the order of an

injection protocol.

FIG. 17 is a configuration diagram of the medication interface 62.

Referring to FIG. 17, the medication interface 62 includes the bed model 62a and the patient model 62b.

First, the bed model 62a is a 3D model of a bed, and is provided in the middle of the medication interface 62.

In addition, the patient model 62b is the 3D model of a patient, and is provided on the bed model 62a.

FIG. 18 is a configuration diagram of the curtain interface 66.

Referring to FIG. 18, the curtain interface 66 includes a curtain-opening item 66b, a curtain-closing item 66c, and a curtain icon 66d.

First, the curtain-opening item 66b is provided on the left of the curtain interface 66, and is used for opening the curtain object 66a.

In addition, the curtain-closing item 66c is provided to the right of the curtain-opening item 66b, and is used for closing the curtain object 66a.

In addition, the curtain icon 66d is provided between the curtain-opening item 66b and the curtain-closing item 66c, and is formed movable to the curtain-opening item 66b or the curtain-closing item 66c.

FIG. 19 is a configuration diagram of the injection site

interface 69.

Referring to FIG. 19, the injection site interface 69 includes injection method icons 69a, box icons 69b, and injection site pictures 69c.

First, a plurality of injection method icons 69a are provided grippable in the middle of the injection site interface 69, and the practice items 32a are displayed in the injection method icons 69a.

Herein, the injection method icons 69a may include intramuscular injection, intradermal injection, and subcutaneous injection icons.

In addition, the box icons 69b are provided above the injection method icons 69a, and the injection method icons 69a are gripped and placed in the box icons 69b.

In addition, a plurality of the injection site pictures 69c are provided above the box icons 69b, and the injection site pictures 69c show injection sites corresponding to the injection method icons 69a placed in the box icons 69b.

In addition, at the upper portion of the injection site interface 69, an injection site selection guide phrase 69a is displayed in words. For example, the injection site selection guide phrase may be “Find the correct injection site”.

In the injection site interface 69, when the learner grips one of the injection method icons 69a and moves the same to one of the box icons 69b, the learner may select the injection site

picture 69c appropriate for the injection method.

FIG. 20 is a configuration diagram of the detail interface 70.

Referring to FIG. 20, the detail interface 70 includes a detailed picture 70a and a guideline box 70b.

First, the detailed picture 70a is provided on the left of the detail interface 70. The detailed picture 70a shows a plurality of injection points to which injection is allowed with respect to the injection site picture 69c.

In addition, the guideline box 70b is provided to the right of the detailed picture 70a, and is used for giving guidance on an accurate injection point.

In addition, between the detailed picture and the guideline box 70b, the syringe product 48a movable to the injection points in the detailed picture is provided.

For example, regarding intramuscular injection, when an injection site is the back region of a buttock, the accurate injection point is as follows.

Specifically, with the patient model bring the big toes inward in a prone position and exposing a buttock, the injection point may be an upper outer portion with respect to a slant line connecting the greater trochanter of femur and the posterior superior iliac spine (PSIS), or a point 5 cm below the iliac crest, or an upper outer region among the parts resulting from quadrisection of the buttock.

FIG. 21 is a configuration diagram of the angle adjustment interface 73.

Referring to FIG. 21, the angle adjustment interface 73 includes a protractor object 73a, an angle readjustment button 73c, and an inject button 73d.

First, the protractor object 73a is provided in the middle of the angle adjustment interface 73, and is used for adjusting the injection angle of the syringe product 48a.

In addition, a skin cross-section 73b is provided below the protractor object 73a, and the skin cross-section 73b shows the cross-section of the skin of the patient model 62b.

In addition, the angle readjustment button 73c is provided to the right of the skin cross-section 73b, and is formed clickable to adjust the injection angle of the syringe product 48a again.

In addition, the inject button 73d is provided below the angle readjustment button 73c, and is formed clickable to go to the next step.

In addition, an angle adjustment guide phrase is displayed above the protractor object 73a. For example, the angle adjustment guide phrase may be “hold the syringe and adjust the intramuscular injection angle, paying attention to the slant”.

In the meantime, in the middle of the injection interface 74, the detailed picture 70a of an injection site for the patient model 62b is provided.

In addition, at the upper portion of the injection interface 74, an injection guide phrase 74a is displayed.

For example, the injection guide phrase 74a may be "adjust the injection angle and then insert the syringe needle".

In the meantime, at the upper portion of the blood regurgitation check interface 75, a blood regurgitation guide phrase is displayed.

For example, the blood regurgitation guide phrase may be "Hold the bottom of the syringe so that the syringe does not wobble. Pull the inner tube with the other hand to check whether the blood flows wrongly".

In the virtual reality-based apparatus 5 for self-directed practice of medication nursing according to the present disclosure, a learner receives repeated training in fundamental nursing skills that are nurses' main duties through the virtual reality medication nursing program 15 capable of movement recognition and the virtual reality device 11, so that practice education for trained nursing can be completed.

In addition, in the virtual reality-based apparatus 5 for self-directed practice of medication nursing according to the present disclosure, a learner controls a 3D object in real time with his or her hands and has practice through the virtual reality device 11, so that practice education for acquiring knowledge-based skills and improving familiarity through repeated training can be realized in a non-face-to-face

environment.

In addition, in the virtual reality-based apparatus 5 for self-directed practice of medication nursing according to the present disclosure, a learner makes daily movements of pressing, holding, pulling, and releasing a 3D object with his or her hands by using a virtual reality technology capable of recognizing movements in real time, so that realistic practice situations in a virtual reality environment can be adjusted.

In addition, in the virtual reality-based apparatus 5 for self-directed practice of medication nursing according to the present disclosure, an image of a real environment taken with a 360-degree camera is applied as a background screen of virtual reality content, so that a learner can feel as if practicing in his or her practice room anytime and anywhere.

Through this, a learner's anxiety can be reduced and a sense of belonging can be enhanced, and repeated training in a familiar environment can increase adaptability to practice.

In addition, in the virtual reality-based apparatus 5 for self-directed practice of medication nursing according to the present disclosure, a 360-degree virtual reality background screen can be changed, so that when necessary, preparations for a hospital environment rather than a practice room can be made and training in a space where safety is not ensured can be performed.

Although a preferred embodiment of the present disclosure

has been described for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the disclosure as disclosed in the accompanying claims.

WHAT IS CLAIMED IS:

1. A virtual reality-based apparatus for self-directed practice of medication nursing, the apparatus comprising:

a computer (10) in which a virtual reality medication nursing program (15) is installed;

a virtual reality device (11) configured to be worn on a learner's face, and display data output by the virtual reality medication nursing program (15) to the learner; and

a Leap Motion (12) provided in front of the virtual reality device (11), and configured to detect the learner's hand movements through an infrared camera,

wherein the virtual reality medication nursing program (15) comprises:

a storage part (16) in which a virtual practice interface (30) and a plurality of correct answers for a medication nursing process are stored;

a reception part (17) configured to receive hand movement data detected by the Leap Motion (12);

a data processing part (18) configured to process the hand movement data received by the reception part (17);

an output part (19) configured to output hand movement processed data resulting from processing by the data processing part (18) to a virtual practice screen;

a score calculation part (20) configured to analyze data

input by the learner for a question presented on the virtual practice screen, and calculate the learner's score; and

a transmission part (21) configured to transmit output data output by the output part (19) and score data of the learner calculated by the score calculation part (20) to the virtual reality device (11).

2. The apparatus of claim 1, wherein the virtual practice interface (30) comprises:

a login interface (31) for inputting the learner's ID to log in;

a selection interface (32) for selecting a practice item (32a) to be practiced;

an advance preparation interface (35) for preparing medication nursing in advance according to a practice sequence; and

a medication nursing interface (60) for practicing a process of injection using a syringe product (48a) into an injection site of a patient model (62b),

the patient model (62b) is a 3D model of a patient,

the syringe product (48a) is a 3D model of a syringe,

the syringe product (48a) comprises:

a body (48b) formed in a hollow cylindrical shape, and in which medicine is received;

an inner tube (48c) provided inside the body (48b),

and formed to be movable in a longitudinal direction of the body (48b); and

a needle (48d) provided at a distal end of the body (48b), and inserted into a skin of the patient model (62b),

the selection interface (32) comprises:

a plurality of the practice items (32a) provided in a middle of the selection interface (32);

practice icons (32b) provided grippable below the practice items (32a); and

a selection icon (32c) provided above the practice items (32a), and at which one of the practice icons (32b) is placed, the one practice icon (32b) being gripped,

the practice items (32a) include intramuscular injection, intravenous injection, endotracheal suction, gavage, blood transfusion, subcutaneous injection, and intradermal injection items, and

the advance preparation interface (35) comprises:

a preparation sequence interface (36) for checking an advance preparation sequence in advance according to the practice item (32a) selected in the selection interface (32);

a hand hygiene interface (40) for practicing virtual hand hygiene;

a prescription reading interface (45) for reading a medication prescription and medication rules individually;

a medicine preparation interface (46) for selecting a

plurality of article objects required for medicine preparation;

a medication preparation interface (49) for injecting a medicine object required for medication nursing into the syringe product (48a) according to a preset dose and method; and

an article preparation interface (50) for selecting a plurality of article objects required for medication nursing preparation.

3. The apparatus of claim 2, wherein the preparation sequence interface (36) comprises:

a plurality of advance preparation items (36a) provided on the right of the preparation sequence interface (36);

protocol icons (36b) provided to the right of the advance preparation items (36a), and grippable according to the advance preparation items (36a); and

a plurality of number icons (36c) provided to the right of the protocol icons (36b), and at which the protocol icons (36b) gripped are placed in order,

the advance preparation items (36a) include medication prescription and medication rule reading, medicine-in-syringe measurement, intramuscular injection medicine preparation, hand hygiene, ampule opening, and article preparation items,

the hand hygiene interface (40) comprises:

a hand hygiene sequence interface (42) for checking a hand

hygiene sequence in advance;

a hand hygiene practice interface (43) for practicing virtual hand hygiene according to the hand hygiene sequence; and

an article selection interface (44) for selecting a plurality of article objects required for medication nursing,

the hand hygiene sequence interface (42) comprises:

a plurality of hand hygiene pictures (42a) provided at an upper portion of the hand hygiene sequence interface (42);

hand hygiene protocols (42b) provided below the hand hygiene pictures (42a), and grippable according to the hand hygiene pictures (42a); and

preparation number icons (61c) provided to the right of the hand hygiene protocols (42b), and at which the gripped hand hygiene protocols (42b) are placed,

the hand hygiene pictures (42a) include pictures of nails, thumbs, the other fingers, both hands put together, and palms,

the hand hygiene practice interface (43) comprises:

a washbasin object (43a) provided in a middle of the hand hygiene practice interface (43);

a tap object (43b) provided in a middle of the washbasin object (43a), and through which a water object for washing a hand model is discharged;

a soap object (43c) provided at a side of the

washbasin object (43a), and for washing the hand model;

a hand sanitizer object (43d) provided next to the soap object (43c), and for disinfecting the hand model; and

a hand towel receiving part (43e) provided to the right of the washbasin object (43a), and grippable such that a hand towel object (43f) for removing the water object is discharged,

the tap object (43b) enters an open state when touched in a closed state, and enters the closed state when touched in the open state,

in the hand hygiene practice interface (43), hand hygiene practice is performed using the water object and the soap object (43c) or using the hand sanitizer object (43d) until an actual hand hygiene time period reaches or exceeds a preset reference hand hygiene time period, and

the actual hand hygiene time period is measured as a time interval from a time point of the first touch of the tap object (43b) to a time point of the first grip of the hand towel object (43f).

4. The apparatus of claim 2, wherein the prescription reading interface (45) comprises:

a laptop computer object (45a) provided in a middle of the prescription reading interface (45), and touchable such that the medication prescription and the medication rules are

individually read;

a medication card (45b) provided at a side of the laptop computer object (45a), and into which input is enabled according to the medication prescription and the medication rules; and

a barcode output button (45c) provided at a lower portion of the medication card (45b), and clickable such that the medication card (45b) in which input is completed is output,

the medication rules include a subject registration number, a subject name, a drug name, a dose, an administration route, and administration time,

the medicine preparation interface (46) comprises a medicine interface (48) in which a plurality of the syringe products (48a) and ampule objects (48f) selectable when clicked are provided,

each of the syringe products (48a) remains wrapped in a wrapper product (48e),

each of the ampule objects (48f) has a top provided with an ampule top object (48g) removable by being snapped backward, and a medicine object is received inside each of the ampule objects (48f),

a side of the medication preparation interface (49) is provided with an alcohol box (49a) in which an alcohol swab object (49b) for covering and disinfecting the ampule top object (48g) is received,

the medication preparation interface (49) comprises:

a general waste bin object (49c) provided at a lower portion of the medication preparation interface (49), and for disposing of a wrapper object;

a medical waste bin object (49d) provided next to the general waste bin object (49c), and for disposing of the alcohol swab object (49b); and

a damaging waste bin object (49e) provided next to the medical waste bin object (49d), and for disposing of the ampule top object (48g),

in a middle of the article preparation interface (50), the plurality of article objects required for medication nursing preparation and selectable when clicked are provided, and

in the article preparation interface (50),

each of the article objects is selected when clicked once, and selection of each of the article objects is canceled when each of the article objects is clicked twice, and

when selection of the article objects is completed, the article objects selected and the article objects insufficient are individually visually displayed.

5. The apparatus of claim 2, wherein the medication nursing interface (60) comprises:

a medication sequence interface (61) for checking a medication preparation sequence in advance;

a medication interface (62) for practicing medication nursing for the patient model (62b);

a nurse introduction interface (63) for introducing a nurse to the patient model (62b);

a hand hygiene guide interface (64) for giving guidance on hand hygiene for the patient model (62b);

a patient check interface (65) for checking the patient model (62b) to be subjected to medication nursing;

a curtain interface (66) for closing a curtain object (66a) to protect the patient model (62b)'s privacy;

a bed adjustment interface (67) for adjusting a height of a rail of a bed model (62a);

a pain reduction interface (68) for selecting a pain reduction method in injection;

an injection site interface (69) for selecting the injection site appropriate for an injection method;

a detail interface (70) for selecting a detailed injection site according to the injection site selected in the injection site interface (69);

a hand hygiene execution interface (71) for practicing virtual hand hygiene just before medication nursing;

a disinfection preparation interface (72) for preparing disinfection for the detailed injection site selected in the detail interface (70);

an angle adjustment interface (73) for adjusting an angle

of the syringe product (48a);

an injection interface (74) for injection using the syringe product (48a) into the injection site of the patient model (62b); and

a blood regurgitation check interface(75) for checking whether blood flows wrongly into the inner tube (48c) of the syringe product (48a).

6. The apparatus of claim 5, wherein the medication sequence interface (61) comprises:

a plurality of injection preparation items (61a) provided on the right of the medication sequence interface (61);

injection protocol icons (61b) provided to the left of the injection preparation items (61a), and grippable according to the injection preparation items (61a); and

a plurality of preparation number icons (61c) provided to the right of the injection protocol icons (61b), and at which the medication preparation protocol icons (36b) gripped are placed in order,

the injection preparation items (61a) include hand sanitizer-used hand hygiene, medication purpose explanation, curtain-used privacy protection, subject check, nurse introduction, and detailed explanation-to-subject items,

the medication interface (62) comprises:

the bed model (62a), a 3D model of a bed, provided in a

middle of the medication interface (62); and

the patient model (62b), a 3D model of a patient, provided on the bed model (62a), and

the curtain interface (66) comprises:

a curtain-opening item (66b) provided on the left of the curtain interface (66), and for opening the curtain object (66a);

a curtain-closing item (66c) provided on the right of the curtain-opening item (66b), and for closing the curtain object (66a); and

a curtain icon (66d) provided between the curtain-opening item (66b) and the curtain-closing item (66c), and movable to the curtain-opening item (66b) or the curtain-closing item (66c).

7. The apparatus of claim 5, wherein the injection site interface (69) comprises:

a plurality of injection method icons (69a) provided grippable in a middle of the injection site interface (69), and showing the practice items (32a);

box icons (69b) provided above the injection method icons (69a), and at which the injection method icons (69a) gripped are placed; and

a plurality of injection site pictures (69c) provided above the box icons (69b), and showing the injection sites

corresponding to the injection method icons (69a) placed in the box icons (69b),

the detail interface (70) comprises:

a detailed picture (70a) provided on the left of the detail interface (70), and showing a plurality of injection points to which injection is allowed with respect to one of the injection site pictures (69c); and

a guideline box (70b) provided to the right of the detailed picture (70a), and for giving guidance on an accurate injection point among the injection points,

the angle adjustment interface (73) comprises:

a protractor object (73a) provided in a middle of the angle adjustment interface (73), and for adjusting an injection angle of the syringe product (48a);

a skin cross-section (73b) provided below the protractor object (73a), and showing a cross-section of skin of the patient model (62b); and

an angle readjustment button (73c) provided to the right of the skin cross-section (73b), and clickable to adjust the injection angle of the syringe product (48a) again, and

the injection interface (74) has a middle provided with the detailed picture (70a) of the injection site for the patient model (62b).