Medicines Clinic
A novel learning opportunity for understanding health literacy

Full Report

James Windle, Aynsley Peterson, Rhiannon Braund, Stephen Duffull

School of Pharmacy
University of Otago

October 2015

Authors

James Windle – School of Pharmacy, University of Otago
Aynsley Peterson – School of Pharmacy, University of Otago
Rhiannon Braund – School of Pharmacy, University of Otago
Stephen Duffull – School of Pharmacy, University of Otago

Publishers:

Ako Aotearoa National Centre for Tertiary Teaching Excellence
PO Box 756
Wellington 6140

This project was funded through the Ako Aotearoa Southern Hub Regional Hub Fund 2014.

Published:

ISBN 978-1-927202-93-7

October 2015

This work is published under the Creative Commons 3.0 New Zealand Attribution Non-commercial Share Alike Licence (BY-NC-SA). Under this licence you are free to copy, distribute, display and perform the work as well as to remix, tweak, and build upon this work non-commercially, as long as you credit the author/s and license your new creations under the identical terms.

Table of Contents

Executive Summary 4
Background 4
Methodology 5
Outcomes and Recommendations: 6
Impact on practice 6
Impact on learners 6
Impact on the team 7
Further opportunities for MHLC in the community 7
1.0 Background 9
1.1 Health literacy- scope and consequences 9
1.2 Information in pharmacy can be very confusing 10
1.3 Pharmacists' professional responsibilities and competence 10
1.4 Challenges of teaching in a practice environment 11
1.5 Tools to build health literacy in pharmacy 12
1.6 Medicines and health literacy clinic (MHLC) 13
2.0 Aims 14
3.0 Methodology 14
3.1 Venue and advertising 14
3.2 Pharmacists attending clinics 15
3.3 Students attending clinics 15
3.4 Student activities 16
3.4.1 Pre-clinic readings 16
3.4.2 Reflection exercise 16
3.4.3 Exit survey 17
3.5 Process for consent for patients 17
4.0 Results 18
4.1 Analysis of clinic and survey data 18
4.1.1 Clinic and student data 18
4.1.2 Resources used 20
4.1.3 Health literacy knowledge 23
4.1.4 Organisational matters 24
4.1.5 Confidence, contribution and concerns 25
4.1.6 Future participation and recommendation 30

4.2 Analysis of student reflection activity 30
4.2.1 Reasons for patients attendance to clinic 30
4.2.2 "Three steps to better health literacy" used to increase a patient's understanding. 31
4.2.3 Student reflection for patient outcomes using MHLC. 35
4.2.4. Student reflection of discussions enhancing health literacy....37
5.0 Discussion....38
5.1 Student engagement 38
5.2 Student learning 38
5.3 Patient engagement 40
5.4 Organisation and management....41
6.0 Study limitations....42
7.0 Future directions 42
7.1 MHLC- New achievements and dissemination....42
7.2 Impact on practice 43
7.3 Impact on learners....43
7.4 Impact on the team....44
7.5 Recommendations for providing additional student and staff support....45
7.6 Further opportunities for MHLC in the community....45
7.7 Challenges ahead....46
8.0 References....48
9.0 Appendices 50
Appendix One: Student resource list 50
Appendix Two: Medicine and health literacy clinic reflection exercise....51
Appendix Three: Student information and consenting form....52
Appendix Four: Student exit survey 55
Appendix Five: Patient consent form 58
Appendix Six: MHLC Dissemination June 2014 –July 2015....60

Executive Summary

In mid-2014, a group of University of Otago School of Pharmacy academic staff members began running monthly Medicines and Health Literacy Clinics (MHLC) within the Dunedin community with final year pharmacy students attending. There were three aims: 1) to provide a community based patient-centred placement opportunity for final year students to better understand adult health literacy; 2) to provide a complimentary service providing medicines information for Dunedin residents led by the School of Pharmacy; 3) to provide an environment where students and academic pharmacists could interact, while illustrating a new example of activities possible in clinical care settings. This paper reports on the outcomes over one year since the initiation of MHLC.

Background

In New Zealand, good health literacy means people "have the capacity to obtain, process and understand basic health information and services in order to make informed and appropriate health decisions" (Kōrero Mārama, Ministry of Health, 2010). More than half of adult New Zealanders have low levels of health literacy (Ministry of Education, 2006) which is inclusive of both numeracy skills and knowledge around health information (Workbase, 2013). The extent of low health literacy concerns all health professionals as impacts include: increased hospitalisation rates for chronic conditions, reduced ability to effectively manage long-term conditions and reduced ability to communicate to health professionals (Reid and White, 2012).

The Pharmacy Council of New Zealand (PCNZ) requires of all registered practicing pharmacists that they demonstrate competency in encouraging and supporting individuals in enhancing their health literacy and in self-managing their health and medicines, while identifying and addressing factors likely to affect adherence adversely. It is therefore important that students in the profession have the opportunity to directly gain exposure of how literacy around medicines affects patients' everyday lives. Placement opportunities in the current BPharm course for students which allow communication practice, then reflective learning about both health literacy and problem solving are limited.

The School sought an opportunity to create an experiential placement that gave back to the community in a meaningful and practical manner. This clinic offers a patient-centred health information opportunity to improve health literacy in the community. The MHLC (also known as a 'Brown Bag Medication Review') encourages patients to bring all of their medicines and supplements to a community setting without appointment or cost. Typical discussions centre around answering patient concerns, verifying what is being taken, identifying medication interactions or errors and improving aspects of adherence.

Methodology

The Clinic

The MHLC commenced in June 2014. Clinics were held on a monthly basis for a two or three hour duration. Venues included residential aged care facilities that incorporated independent living and community halls that were located in areas of high socioeconomic deprivation (Ministry of Health, 2008). Promotion of the clinic was conducted via public newspaper advertising if in the community, or via advertising flyers and newsletters distributed to residential aged care homes prior to the clinic dates. Local community pharmacies were advised directly of clinic times and pharmacist staff invited to attend.

Staff of the School of Pharmacy who held annual practicing certificates (APCs) as pharmacists were communicated with, inviting attendance to each clinic session. On occasion, personal communication was also made to specific pharmacists external to the University and all attendances were on a voluntary basis around current work demands and availability.

The Students

All final (fourth) year pharmacy students (n=144 in 2014 and n=153 in 2015) were sent a clinic notification email two weeks prior, inviting expressions of interest to attend. The MHLC was offered to students on a voluntary participation and for attendance only if there was no timetable clash with curriculum activities, assessments etc. Student selection was made by one member of staff on the basis of several factors including staff numbers attending and clinic venue. Ratios tended to be two to three students to each pharmacist in attendance. A total of eighteen students attended 6 clinics from June to December 2014 and twenty-seven students attended 5 clinics from February to June 2015, representing approximately 30% of the mean final year student cohort.

Student activities relating to MHLC attendance included the following:

1) Pre-clinic readings published resources to which the URL links had been provided on an electronic learning management system (Blackboard). Included on this site (and central to the clinic activity) was the published literacy tool *Three steps to better health literacy* booklet produced for the Health Quality & Safety Commission New Zealand by Workbase.
2) Post-clinic reflection assignment on experiences gained, usefulness to the patient and how the three step approach to health literacy assisted their learning.
3) Exit survey for students who had consented to an ethics approved study to identify changes in student understanding of health literacy and the value of MHLC as a placement opportunity for learning.

Outcomes and Recommendations:

Impact on practice

The HLMC has had the following impact on the community:

1. Improved health literacy for many patients accessing this clinic through 3 step health literacy tool as measured by feedback from the patients, observation by pharmacists, reporting in survey instrument and reflection by learners.
2. Improved health outcomes to several patients through education in optimising medicines directly in the clinic or as a result of follow-up work with patient feedback.
3. Attempted to address a previously unknown demand for opportunities within the community to contribute to health outcomes by improvement in health literacy as evidenced by clinic attendance of 65 patients over 11 clinics.
4. No adverse communication events have been reported from sessions conducted thus far.

Impact on learners

The HMLC has had the following impact on final year pharmacy students attending:

1. The School has been able to place approximately a quarter of all final year students into the MHLC over a period of one year. Requests to voluntarily participate in each clinic have either matched or exceeded availability of student places. Whilst students may not access each clinic they apply for, the majority will attend at least one MHLC over the year.
2. Most students read the 3 steps to better health literacy as a resource and found this helpful to their learning (survey data).
3. Most students gained knowledge around adult health literacy having undertaken readings then attended the HMLC compared with prior knowledge. Some students who reported a decline in knowledge levels after attending HMLC compared to before, realised they may have over-estimated prior knowledge (survey data). In this case the HMLC provided a framework for the students to reflect on their prior and current awareness and skills in health literacy.
4. Student learning occurred in implementing the 3 steps to better health literacy approach, appreciating the variation of health literacy with which patients present and the need to both build up and help correct aspects to patient knowledge of their medicines (student reflection).
5. Students demonstrated moderate confidence levels discussing medication matters with patients. For a majority of students confidence levels around patient discussion had not changed from what they had estimated their confidence to be prior to attending the clinic (survey data).
6. A large majority of students reported that their self-confidence in communicating directly to patients during the HMLC had increased (survey data). Students' fears/concerns in attending clinics were identified and the vast majority of concerns were positively addressed during the clinic session. Three major themes relating to student concerns were identified for types of concerns the students had. Firstly, feeling insecure about prior knowledge to an extent that this inhibited communication with the patient. Secondly, concerns about the quality of the information. Thirdly,

concerns about his/her ability to communicate the information to the patient (survey data).

7. Students perceived varying levels of contribution to patient conversations mostly being adequate or fully inclusive, however they indicated a greater desire to contribute more fully to patient conversation (survey data).
8. All students wished to further participate in future clinics and similarly would recommend other students attend a MHLC (survey data)
9. Students received unique and valuable clinical tuition from academic pharmacists over the clinic time, felt supported in their own conversations with the patients, and appreciated discussions drawing connections made from classroom learning to their patient experience (student reflections).
10. Students could that appreciate academic staff members, who are pharmacists, can contribute directly to patient care in this placement experience.

Impact on the team

The HMLC has had the following impact on academic staff members who attend and manage the placement:

1. Provided a chance to share clinical knowledge from past teaching, research and practice experience to both patients and students in a new forum that encourages three-way learning opportunities.
2. Created an opportunity to provide direct and immediate positive health outcomes to patients in the local community.
3. Allowed the opportunity to formalise staff members' own learning objectives around adult health literacy for their own continuing professional development that contributes to registration requirements for the Pharmacy Council of New Zealand.
4. Opportunities to bring back these experiences into the classroom.
5. An opportunity for further engagement of some patients into the "friends of the pharmacy school" programme for future education sessions with students.
6. Some patients have indicated a willingness to further contribute to the School's teaching programme back in the classroom setting, so these clinics have provided a new opportunity to have further engagement with patients over a longer time frame and will benefit greater numbers of students and staff.
7. Contributing roles for team members are both clearly defined and supportive in respect of administrative, clinical and educational responsibilities.

Further opportunities for MHLC in the community

1. It is intended that the MHLC will continue to be held on a monthly basis either in a community hall setting or within a residential retirement village. We believe these clinics have addressed the 3 core reasons that underpinned their inception. In addition, they have also provided an opportunity for our students to engage in voluntary activities that help their community.
2. The management team conduct regular meetings to determine sites to hold future clinics. In July 2015 a clinic was conducted at a Mosgiel retirement village which has

been very receptive to this opportunity. Other retirement villages within the greater Dunedin area have been identified and are at various stages of having approaches made to them.

3. While the South Dunedin church hall has worked well as a venue and will continue to be used, other community localities are being identified especially in North Dunedin where possible MHLC's may be conducted in the future.
4. An additional setting to a community situated MHLC is being considered whereby patients will access this service within the University. It would be expected that appointments (block or episodic timetabling) would be made which would allow staff to be efficient with time management and flexibility around current teaching and research responsibilities. Being located on campus may also allow greater availability of students and easier access to resources. These would not replace clinics in local communities but will provide an additional opportunity for patients to attend clinics from outside of the local regions.
5. A local community pharmacy is wishing to conduct a MHLC within their own premises. The 2015 date is yet to be determined and the School is offering assistance with staff and students. This interest was led by a current pharmacy intern employed at this locality, who had attended a MHLC clinic in 2014 as a final year student. This is very encouraging as it is the School's wish to encourage uptake of this service within community pharmacy. Student exposure in current MHLC could be very useful for future uptake into pharmacies throughout the country as new graduates transfer learning into workplace settings.
6. Ultimately it is anticipated that all final year students will have an opportunity to attend at least one MHLC once logistical challenges have been overcome.

Challenges ahead

1. **Timetabling**. Timetabling clinic sessions that allow for optimal patient attendance at the same time as students can make themselves available from normal curriculum activities. A full curriculum review of the BPharm programme is currently being undertaken and it is expected that this will result in greater flexibility in the programme which should aid MHLC clinic opportunities.
2. **Staff involvement**. Increasing academic staff involvement. While each month relevant academic staff who hold annual practicing certificates (APCs) are notified by email of clinic session times and localities, the offer to participate has not been taken up for numerous reasons. Some relate around teaching and research schedule clashes, others are part time and do not work at the University on the scheduled day. Again it appears that greater flexibility in the way the clinics are managed should provide more opportunity for staff.
3. **Patient availability**. Logistic balances between ratios of patients, academic pharmacists and students attending to optimize learning is ongoing and unlikely to be further refined whilst working within the community. Free and accessible clinics held once a month during a fixed time in the community or retirement centres create unpredictable uptake by patients. This may be partly accommodated by the additional introduction of a booked time clinic. However we also believe that uptake

will improve and become more predictable as the clinic becomes more well recognized within the community

4. **Other clinic opportunities**. The School is actively investigating other clinic opportunities and has recently explored the possibility of running MHLC activities in adjunct to some nurse lead community clinics.
5. **Funding**. While the School is keen to continue to run complimentary clinics we believe that these should be funded by the DHB. This is an important service for the community and is especially important in those communities where travel to health care centres is either prohibitive on the basis of cost or lack of available transport. Ultimately the School will not be able to sustain a dramatic increase in clinic opportunities without additional support.

1.0 Background

1.1 Health literacy- scope and consequences

At some point, most people will experience an episode of low health literacy (not to be confused with low intelligence) whereby they find aspects of their healthcare to be too complicated to understand. Difficulty around healthcare understanding is often further compounded by a patient's health status such as feeling ill or stressed at the time (Reid and White 2012).

In New Zealand, good health literacy means people "have the capacity to obtain, process and understand basic health information and services in order to make informed and appropriate health decisions" (Kōrero Mārama, Ministry of Health, 2010). This definition requires three processes to occur: firstly, that the person and whānau acquire the information they need. Secondly, that they understand such information and decide if it is relevant and accurate. Thirdly, that they act on that information. Such requirements may be ongoing or episodic in nature (Reid and White 2012).

In 2006, the *Adult Literacy and Lifeskills Survey* (Ministry of Education) showed over half (56.2%) of adult New Zealanders (1,626,000 adults) have low levels of health literacy (below level three, where level one is very low skills and five is very high skills). Lower rates of health literacy are reported in people with limited education, people with limited income, people who have English as a second language, younger, older and unemployed. While Pākehā comprise the largest group with low health literacy in New Zealand, Māori have much lower health literacy rates compared with non-Māori regardless of other demographic factors. Literacy in the health context is inclusive of both numeracy skills and knowledge, so involves reading, writing, speaking, listening and numeracy around health information (Workbase, 2013). The extent of low health literacy concerns all health professionals, given the impact it has on the individual and the wider health system, including:

- reduced uptake of preventative services;
- reduced ability to recognise initial signs of medical problems;
- reduced ability to effectively manage long-term conditions;
- reduced ability to communicate to health professionals;

- increased hospitalisation rates for chronic conditions
- increased usage of emergency services

(Reid and White 2012)

1.2 Information in pharmacy can be very confusing

All adults in their lives can expect to receive multiple new medications requiring certain levels of health literacy in either acute, episodic or long term situations. Patients will be expected to listen to new information about the medicine at the time of prescribing, to read consumer medicine information materials, to be counselled by pharmacy staff when having their medicines dispensed, to read and follow the labelling instructions. This often requires a new vocabulary around terminology used, speaking to new people, applying numeracy skills to calculations, measuring volumes, timing of doses and interpreting correctly brief technical information on a formatted label. It may be that 40-80% of medical information provided by healthcare workers will be forgotten immediately, and furthermore, almost half of that information is remembered incorrectly (Kessels, 2003). This may all be experienced by a patient whose first language is not English and often communicated by a pharmacy staff member whose rate of speech may be too fast to comprehend.

1.3 Pharmacists' professional responsibilities and competence

Reid and White (2012) encouraged health professionals to improve health literacy by building the skills and knowledge of the individuals, whānau and communities so they can: evaluate the information received; that they can decide if they have enough information; and that they can act on that information. Learning about patients' ethnic backgrounds, cultural and religious beliefs and then the ability to apply this knowledge to shape the health encounter, shows cultural competence and enhances patient centred care (Pharmacy Council of New Zealand, 2015)

Health workforce ethno-demographic changes are being experienced in many health professions including pharmacy (Workforce, 2013). Data from the 2014 Pharmacy Council of New Zealand Workforce Demographics show there continues to be a decline in the number of New Zealand European/Pākehā practicing pharmacists since 2010 (a fall of 3.9%), while over the same period a significant increase of Asian (not defined) practicing pharmacists, up 70.5% (from 4.6% to 7.3% of the total workforce); Chinese practicing pharmacists, up 30.9% (from 9.6% to 11.7% of the total workforce); and Southeast Asian practicing pharmacists, up 139.3% (from 0.9% to 2.0% of the total workforce). Demonstrating competence in communicating with patients whose cultures are different from their own will become increasingly important for all pharmacists as the extent for cross-cultural interactions within the pharmacy sector in New Zealand becomes a common occurrence.

The Pharmacy Council of New Zealand (PCNZ) considers optimal medicine management to be a patient-centred approach focusing on helping patients gain the most benefit from their medicines. This incorporates "talking with and listening to the patient, having honest discussions with them and truly making them part of the decision in relation to their medicines and use of their medicines" (Pharmacy Council, 2015, p.6). Taking appropriate steps to improve adherence to treatment and health outcomes by focusing on a patient's

culture along with their medical condition is a mandatory requirement acknowledged by the Pharmacy Council (NZ) for all registered pharmacists practicing within New Zealand's culturally diverse environment (M1.4, Competence Standards, 2015). For pharmacists working directly with patients in the health and medicine management domain, the Council requires that they demonstrate competency in encouraging and supporting individuals in enhancing their health literacy and in self-managing their health and medicines, while identifying and addressing factors likely to affect adherence adversely (01.3.8, Competence Standards, 2015).

1.4 Challenges of teaching in a practice environment

Pharmacists in training (undergraduates and interns) are on an educational and experiential pathway towards achieving competencies as set by the Pharmacy Council of New Zealand (PCNZ, established under the Health Practitioners Competence Assurance Act 2003). As this profession requires an internship, competence is not required on completion of university studies. Demonstration of such entry-level competencies will need to occur during their vocational training year as an intern in order to then achieve registration as a pharmacist. The process of competence development is a lifelong cycle of doing and reflecting with a focus on behaviours required for effective practice performance (PCNZ, 2015). It is therefore vitally important that undergraduate pharmacy students are given opportunities to be directly exposed to learning opportunities that incorporate demonstrations of competence in professional settings.

Experiential activities are powerful teaching components of programmes, involving the provision of opportunities to 'adopt a deep rather than a surface approach to learning' as a student builds their skills in professional practice (Loftus & Higgs, 2005). While placements provide opportunities for students to engage actively in learning within a clinical environment, there are often very few opportunities for direct patient-centred problem-solving. Rather, the focus has been on undertaking structured and well defined task-oriented activities.

The School of Pharmacy, University of Otago, combines undergraduate teaching with a series of experiential placements during the three years that the students progressively move through the course. The progression of the undergraduate within the Otago BPharm programme shown in Fig.1 illustrates the increasing, but limited, proportion of time spent in an experiential setting that involves a direct opportunity for patient contact and to model professional behaviours required. As shown, much of the experiential learning will occur in the internship setting which allows the graduate to train and practice within a hospital or community pharmacy environment for an extended period.

Typical of many university pharmacy placement programmes throughout Australasia, the Otago pharmacy students will experience a mixture of placement types. Initially placements are highly structured with very specific tasks outlined. Towards their final year, students can construct their own learning goals, objectives become broader and more opportunity is made of situation-specific experiential learning opportunities. Preceptors (pharmacists responsible for student learning while on placement) provide numerous and variable approaches in both encouraging student engagement and for creating teaching opportunities around patient-centred activities.

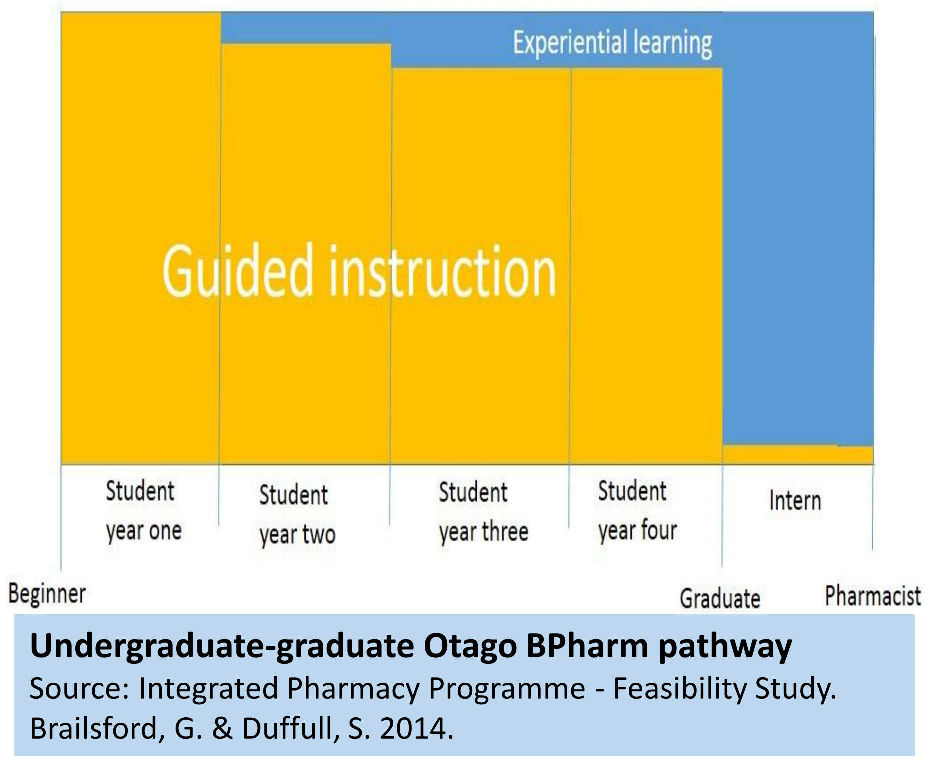

Figure 1 Undergraduate-graduate Otago BPharm pathway

Placement opportunities in the current BPharm course for students which allow communication practice, then reflective learning about both health literacy and problem solving are limited. It may be considered that opportunities to learn about adult health literacy via direct patient contact have yet to be adequately addressed and that more opportunities are needed to meet future professional expectations.

1.5 Tools to build health literacy in pharmacy

While there have been a number of published literacy tools for use in community pharmacies, one model has more recently been developed for the New Zealand context. Workbase has been commissioned by the Health Quality and Safety Commission New Zealand to specifically develop a resource for New Zealand community pharmacists to employ in any setting where patient communication about their medicines will occur. Use of this resource has been promoted in several educational training resources including a publication *Increasing your patient's medication adherence* (New Zealand College of Pharmacists, 2013) and in pharmacist audioconference training *Health Literacy: a one hour learning bite* (Reid, 2014). This model provides statements and examples using three simple steps to follow in order to achieve health literacy education and achieve intervention success (Fig.2).

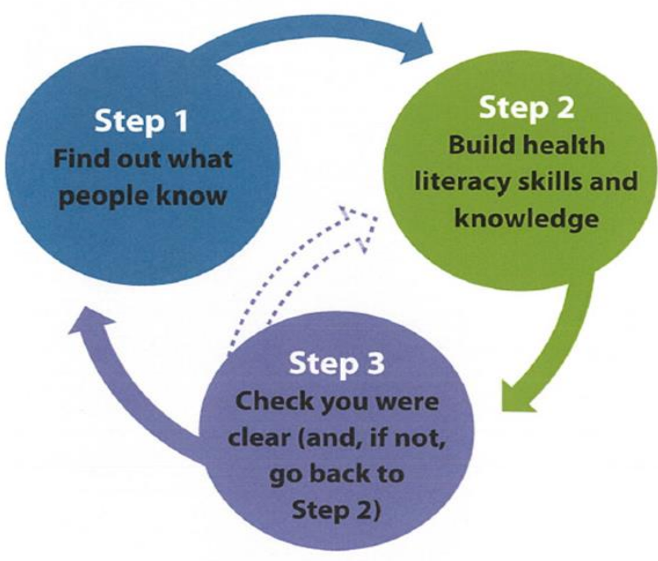

Figure 2 Three steps to better health literacy – Health Quality & Safety Commission NZ, 2013

Health literacy training within the pharmacy profession is at a relatively early stage. However, health literacy is recognised as being vital to individual and collective health outcomes. There is a pressing need to introduce this concept more formally into educational programmes. The School of Pharmacy acknowledges the importance of educating the future pharmacist workforce about adult health literacy and introducing the 'three steps to better health literacy' model to undergraduates within a conducive learning environment.

1.6 Medicines and health literacy clinic (MHLC)

The School of Pharmacy has wanted to develop a larger footprint of health care in terms of presence in the Dunedin community since 2013. The public may be aware of the School's existence only by the presence of students within the community in the broadest sense, perhaps encountering them occasionally in a placement site. The School sought an opportunity to create an experiential placement that gave back to the community in a meaningful and practical manner. The Medicines and Health Literacy Clinic (MHLC) was created. This is resourced by academic staff pharmacists and pharmacists-in-training (final year undergraduate students). This clinic offers a patient-centred health information opportunity to improve health literacy in the community. The MHLC (also known as a 'Brown Bag Medication Review') is a practice more common in North America, that encourages patients to bring all of their medicines and supplements to a medical or community setting. This provides qualified staff with an opportunity to review and discuss the medicines that the patient is taking using the Health Literacy Framework (Fig 2) to improve patient health literacy. Typical discussions can centre around:

- Answering patient concerns
- Verifying what the patient is taking

- Identifying and/or avoiding medication errors and drug interaction
- Assisting patients to take medications correctly

(Universal Precautions Toolkit, 2015)

While the typical student-staff interaction has been via facilitation of information driven through lecture or workshop delivery, there has not been an opportunity for students to engage with academic staff in a professional context until instigating MHLC.

No such clinic instituted within a New Zealand or Australian context has been reported in the literature to date, making this experiential placement a unique chance to monitor and report outcomes that may have interest amongst a wider academic and professional audience.

2.0 Aims

There were three aims for establishing a Medicines and Health Literacy Clinic:

1. To provide a novel experiential learning opportunity within the community setting for final year undergraduate students that allows for patient-centred communication to better understand aspects of health literacy.
2. To provide a complimentary service for Dunedin residents by providing medicines information in response to questions and concerns members of the public may have.
3. To create an opportunity for academic pharmacists and students to interact on placement and to illustrate to students an example of the breadth of activities that are possible in clinical care settings.

3.0 Methodology

Medicines Clinics commenced on a monthly basis beginning June 2014 initially for three hours duration. From observing attendance patterns of patients over the clinic hours this was then revised in May 2015 to two hours.

3.1 Venue and advertising

To meet the aim of providing the clinic within the community, co-authors of this report would determine appropriate venues. It had been agreed that clinics would operate either in community venues within Dunedin boundaries or alternatively in Dunedin or Mosgiel retirement village care facilities where independent living units were established.

Clinics held at community hall venues that were located in areas of high socioeconomic deprivation (Ministry of Health, 2008) and were intended to attract interested members of the public from any locality. A series of actions to promote the clinic to the public were carried out including:

- Advertising in the Dunedin weekly community newspaper “The Star” preceding the clinic event.
- Advertising in the Dunedin major newspaper “The Otago Daily Times” during the week of the clinic.

- Flyers placed within the venue site prior to the clinic.
- Flyers were faxed or delivered to community pharmacies identified to be within the local area.
- Signage at the clinic venue during the clinic time.

Clinics held at residential aged care facilities that incorporated independent living were intended to attract local residents of the complex who still experienced independent access to healthcare services (including medicines). Promotion of the clinic to potential participants was actioned through the facility manager or activities coordinator including:

- Flyers that were distributed to residential homes within the complex and on noticeboards
- Clinic information placed within monthly newsletters for distribution to residents

3.2 Pharmacists attending clinics

Prior to each clinic, email communication was used within the Pharmacy School to advise relevant academic staff (those that held Pharmacy Council annual practicing certificates (APCs)) of the upcoming date and venue of the clinic. These staff were invited to participate on a voluntary basis.

When clinics were to be held in community venues, the local community pharmacists were approached by email, fax or direct face to face communication, both making pharmacists aware of the clinic times and objectives as well as inviting them to participate if they were interested and able.

On occasion, personal communication would be made to specific pharmacists external to the university inviting them to attend clinics.

3.3 Students attending clinics

Student numbers were determined by consideration of a number of factors:

- Number of pharmacist staff attending the clinic – usually no more than two students were invited per pharmacist per session (this could be altered according to staff discretion)
- Clinic venue – some venues had space limitations so fewer staff and students could attend. Alternatively, some venues had no space restrictions, so more staff and students could attend

Two weeks prior to the date of the clinic, an email was sent to all fourth year Pharmacy students. This explained the purpose of the clinic, the date, time and venue, and invited them to respond to the sender by a certain date to indicate their interest in attending. The clinic sessions are not compulsory for students, however were mostly held at times with no teaching sessions timetabled, so students could attend if available.

Students who responded to this email were notified that they would be contacted closer to the time of the clinic, to confirm their place (if applicable) and to give further instructions.

Students were chosen by consideration of a number of factors:

- Enthusiasm – students who had been unable to attend other sessions due to timetable clashes, but who were interested to attend were chosen preferentially
- Repeat students – in order to explore the changes in students' learning after repeat clinic experiences, students who had previously attended a clinic were on occasion chosen over a 'new' student attendee
- Random – after considering other factors above, generally students were chosen at random

Once students were chosen, a further email was sent. This email listed venue address, session time and date, the names of the student attendees, offers of taxi vouchers for travel, and directed students to resources about health literacy, for pre-reading.

3.4 Student activities

Students selected to attend the clinic were asked to perform three activities. These consisted of (1) reading allocated resources prior to the clinic, (2) completing a reflection post-clinic activity, and (3) participating in an exit survey (this activity was optional and required consent).

3.4.1 Pre-clinic readings

Communication was made with all selected students prior to attending each clinic requesting they access then read a selection of published resources to which the URL links had been provided on an electronic learning management system (Blackboard). Included on this site (and central to the clinic activity) was the published literacy tool *Three steps to better health literacy* booklet produced for the Health Quality and Safety Commission New Zealand by Workbase. Also included were six further links to New Zealand reports and publications from various agencies including Ministry of Health, BPAC and Health Quality and Safety Commission NZ, all published since 2010. (Refer to Appendix One: Student resource list).

3.4.2 Reflection exercise

A post-clinic reflection activity was required for all students who experienced patient contact. Themes explored in this short reflective piece were:

- Reasons for the patient attending the clinic
- How the 3-step health literacy method was, or could have been implemented to increase patient understanding of their medicines
- Perception of whether the clinic helped the patient gain a better understanding of their medicines and health
- How communicating with both patient and pharmacist in the MHLC advanced student understanding of adult health literacy.

This was a non-assessed activity. However, feedback from one attending pharmacist (staff member) was provided to the student on their reflection. This feedback was emailed to the student, including comments which were supportive of their observations and making explicit reference back to the 3-step health literacy model. (Refer to Appendix Two: Medicines and Health Literacy Clinic Reflection Exercise).

3.4.3 Exit survey

A student exit survey was an appropriate way to collect valuable information about student perceptions of MHLC as a placement opportunity. Responses would demonstrate how and when learning occurred regarding aspects of health literacy communication.

The intention was to disseminate the clinic outcomes including operational and student data to wider audiences through conferences and publications, including this report. Therefore a formal student consent process was followed. University of Otago Human Ethics (Departmental Level) consent was sought and approved (D14/283). (Refer to Appendix Three: Student Information Sheet).

The student exit survey is a 20-item instrument combining a series of tick-box responses, rating scales and small comment sections. (Refer to Appendix Four: Student Exit Survey). The questions related to:

- student understanding about adult health literacy prior to, then following, readings and clinic attendance
- process matters (e.g. attendance instructions, transportation, briefings)
- measures of confidence and contribution in communication around medicines to patients
- students concerns regarding clinic attendance
- further participation/recommendation

Surveys typically took 5 to 10 minutes to complete and were either filled out at the clinic venue or submitted back via student administration over the following ten days.

3.5 Process for consent for patients

Consent form process

After being welcomed to the clinic, pharmacist staff and student/s introduce themselves to the patient (Fig.3). Staff explain to the patient that a requirement of attendance is completing a consent form (Refer to Appendix Five: Patient Consent Form). Patients are offered the opportunity to read the form and encouraged to do so. Staff then explain that the purpose of the clinic is to offer any information about medicines that they are interested in asking about; that the clinic is staffed by registered pharmacists; and that students may be attending the clinic. If students are present, staff ask the patient if they consent to having a student/s present during their session. This is optional for patients. Staff explain that any information discussed at the clinic is treated with strict confidentiality.

Staff also explain that on occasion, information may be disclosed that would be important to refer back to the patient's health care team. The patient is asked to record the name of their community pharmacy and general practitioner on the consent form, to assist in this process. If a referral was required, this would be communicated to the patient prior to any contact with their health care team. While this is recommended, this part of the consent is optional. A patient may choose not to record their pharmacy and general practitioner's details.

Notes form:

The session is recorded as either a:

- Health literacy discussion, or
- Referral

A section is included for notes about the case and questions raised, especially for cases requiring referral.

The pharmacist records the patient's name and the date on the form, and signs the form at the end of the session. Staff usually note attending students' names as well, as a record. Forms are kept in a secure location and will be retained then destroyed after 10 years.

Figure 3 Student with experienced tutor ready to warmly receive next patient during a MHLC

4.0 Results

4.1 Analysis of clinic and survey data

4.1.1 Clinic and student data

Between June 2014 and June 2015, a total of 11 Medicines and Health Literacy Clinics have been held (Table 1). A total of three clinics have been held in two retirement villages within Dunedin city. Eight clinics were held in one community church hall facility located in South Dunedin. During the clinic programme to date, a total of 36 students have attended the clinic at least once, and nine of these students have attended twice. A typical final year class size has approximately 130 students, therefore over a quarter of the class have accessed this clinic at least once. Sixty-five patients accessed the clinic over the 11 clinic sessions excluding partners or support people. Two to three registered pharmacists typically attended each clinic with a maximum of four pharmacists attending two clinics in the retirement

villages. Registered pharmacists attending were predominately clinical academic staff including a Professor (and current Dean), an Associate Professor and two Professional Practice Fellows at the School of Pharmacy. Two other registered pharmacists participated at different times in particular clinic sessions. Mostly, each patient sat with one pharmacist and between one or two students on each occasion.

Table 1 Table of Medicines and Health Literacy Clinic attendance and venue records 2014-2015

Clinic	Date	Students Attending	'Repeat' Students	Patients Attending	Pharmacists Attending	Venue
1	27 June 2014	3	0	6	3	Retirement village
2	18 July 2014	6	1	2	3	Church hall
3	22 Aug 2014	3	0	6	2	Church hall
4	26 Sept 2014	5	2	4	2	Church hall
5	17 Oct 2014	0	0	2	2	Church hall
6	4 Dec 2014	1	0	1	2	Church hall
7	20 Feb 2015	5	1	11	4	Retirement village
8	27 Mar 2015	4	0	9	2	Church hall
9	8 May 2015	8	4	11	4	Retirement village
10	29 May 2015	3	0	8	2	Church hall
11	26 June 2015	7	1	5	3	Church hall
	Totals	**45**	**9**	**65**		

Survey response rates (Table 2) varied between the group of students who had attended the clinic a single time over the 11 months (67%) and the students who had participated in the clinic on two occasions (33%). Response rates were much higher when the consent and survey instrument could be administered when students still remained in the clinic environment, although fewer comments were received in the available segments compared to those students who filled out the survey subsequent to the clinic completion. Students who had consented to the survey but had not handed in within two weeks were followed up by email but response rates were typically low with 6 students responding to the follow-up request.

Table 2 Student survey participation rates

	Participated in Clinic	**Consented to survey**	**Response Rate**
Number students attended once	36	24	67%
Number of students attended twice	9	3	33%

The majority of students attending the clinic were female (65.4%), of New Zealand citizenship (57.7%) and have English as their first language (57.7%). While a slight majority of students identified primary ethnicity as NZ European (38.5%), students identifying as being from an ethnicity other than NZ European consisted of 61.5% of the study population, with 42.3% indicating English was not their first language and 42.3% identifying a shorter length of stay in New Zealand either studying as an international student or having

permanent resident status. The emerging pharmacist workforce comes from increasingly multi-cultural and non-European ethnicities, for which aspects of communication may prove more difficult when patients have poor oral comprehension skills. If patients are not clear on words used in conversation they may stop listening while processing what the word was or means, before resuming active listening again. This may detract from the content of the conversation.

Table 3 Surveyed student demographic information with class and profession comparisons

Surveyed Student Demographic Information	Students attending	2014 Class Totals	2014 Practising Pharmacists[d]
Sex	**N (%)**	**N(%)**	**N(%)**
Males	9 (34.6)	53 (36.0)	1238 (36.3)
Female	17 (65.4)	94 (64.0)	1910 (63.7)
Ethnicity			
NZ European/Pākehā	10 (38.5)	41 (27.9)	1782 (52.3)
Māori[a]	0 (0)	4 (2.7)	52 (1.5)
Pacific Island	0 (0)	0 (0)	30 (0.9)
Chinese	7 (26.9)	51 (34.7)	398 (11.7)
Indian and Other Asian[b]	8 (30.8)	40 (27.2)	541 (15.9)
Middle Eastern	1 (3.8)	2 (1.4)	117 (3.4)
Other[c]	0 (0)	9 (6.1)	486 (14.3)
Citizenship			
NZ Citizen	15 (57.7)	87 (59.2)	-
NZ Permanent Resident	3 (11.5)	27 (18.4)	-
International	8 (30.8)	31 (21.1)	-
Australian Citizen	0 (0)	2 (1.3)	-
English as first language			
Yes	15 (57.7)	-	-
No	11 (42.3)	-	-

[a] *Two students identified Māori as their ethnicity and two students identified two ethnicities: New Zealand European and Māori.*
[b] *Includes: Japanese, Korean, Sri Lankan, Vietnamese, Other Southeast Asian, and Other Asian.*
[c] *Other is made up of African, European, and 'Other'*
[d] *Pharmacy Council of New Zealand Workforce demographics as at 30 June 2014*

4.1.2 Resources used

The majority of students attending clinics had been given sufficient advance notification that allowed them to access pre-clinic resources according to information supplied to them (as previously described in the methodology). Student responses indicate that they had considered the advance notice sufficient to enable reading of the resources made available (Fig.4). The minority of students who had limited time to read such resources commented on the lack of time due to reasons including examination preparation, and clashes with other activities that competed with this task. Two comments suggested a late notification by the School (<24 hours) had hindered prior preparation.

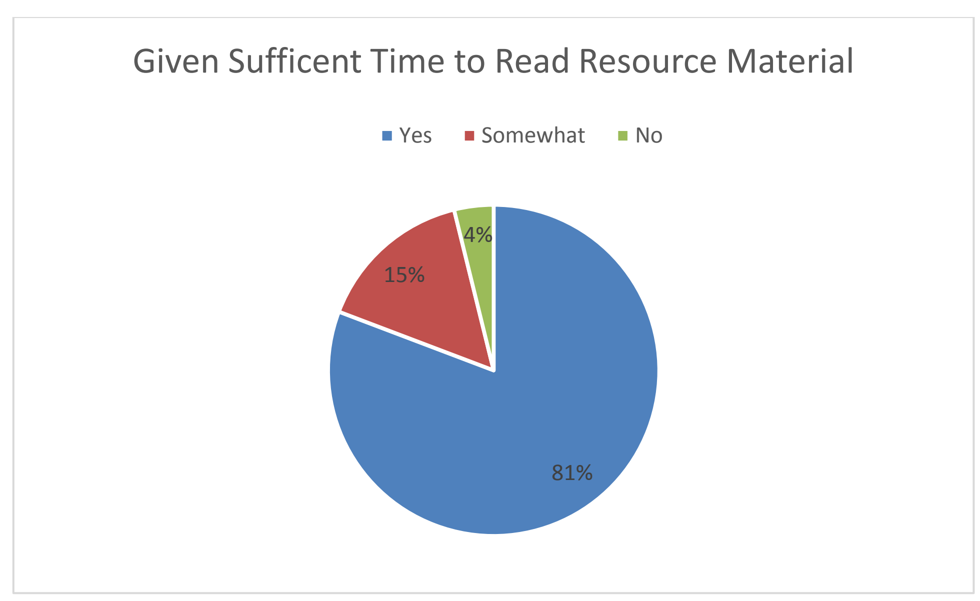

Figure 4 Student percentage response rates for time given to read resources

Student uptake of the resource tool – *Three Steps to Better Health Literacy* was read in advance of attending the clinic by the majority of students (Fig.5). One student not able to read this document had previously commented on clashes with exam preparation as to their difficulty, while another had read it after the clinic. The students indicted that this resource was helpful to their understanding around adult health literacy. Students appreciated the particular format; that it was simple, easy to follow, and condensed. Other comments showed student appreciation of good examples of how to word questions to patients were provided and what they might expect during patient communication. One student commented on becoming aware of new information with a subsequent reading of the article prior to attending a second clinic.

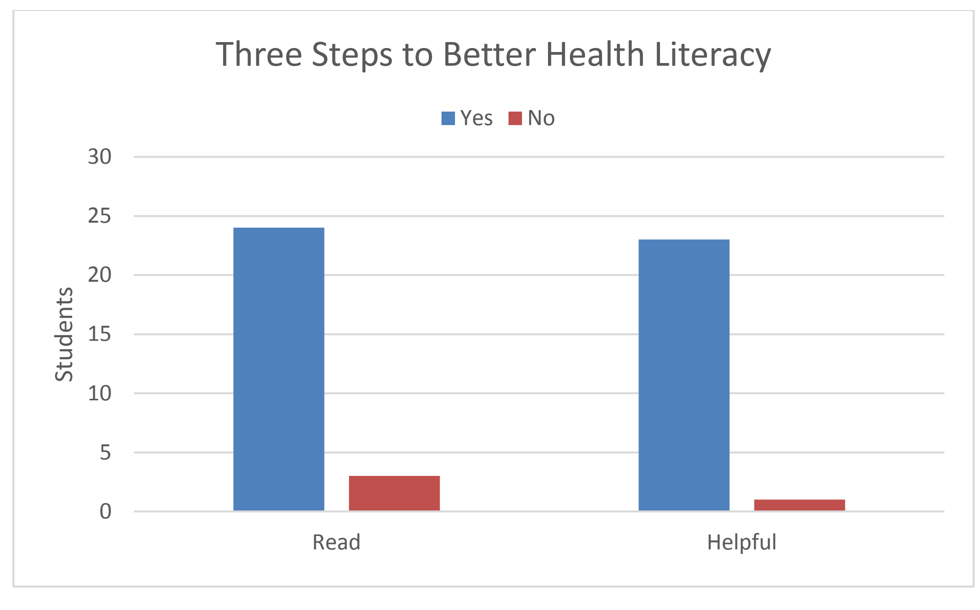

Figure 5 Student response rates for reading 3 steps to better health literacy

Students responding had equally indicated pre-clinic reading to have occurred as those where it had not occurred for some of the articles that had been listed as links under “Resources for Health Literacy”- the resource link in their teaching platform Blackboard (Fig.6).The majority of those students who had accessed these had found the resource(s) to be helpful in their understanding of adult health literacy. Specifically, the resource that was most commonly expressed as being helpful was the article – *Understanding Health Literacy* (Reid and White, 2012). No comments were offered by the minority of students who did not find the resources helpful.

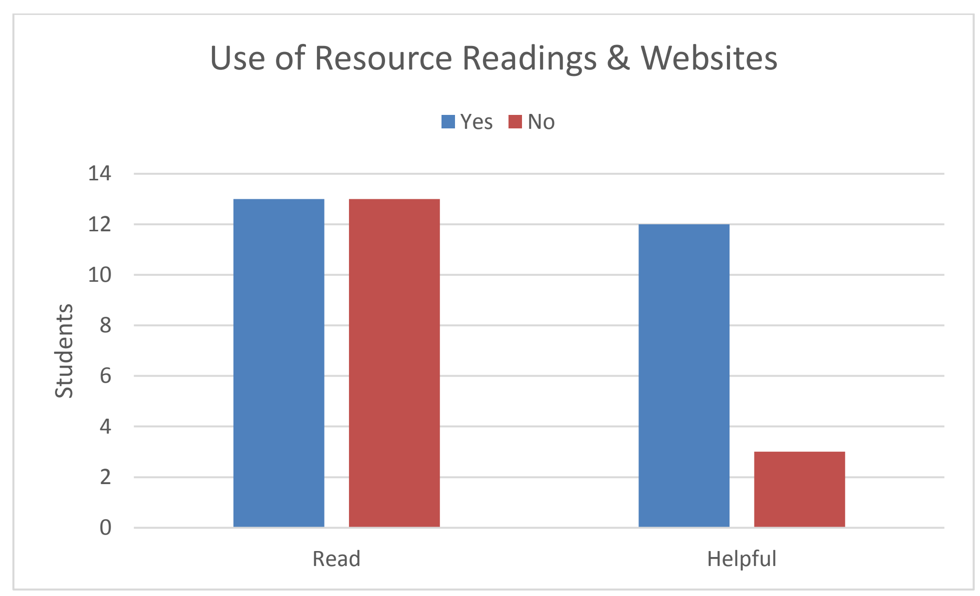

Figure 6 Student response rates to reading other listed resources

Students were more likely not to employ any additional search strategies to access resources on health literacy under their own direction, even if attending the clinic on more than one occasion (Fig.7). Only one comment was recorded for a student who had done so, indicating that they had accessed examples of YouTube clips demonstrating techniques about health literacy for healthcare professionals.

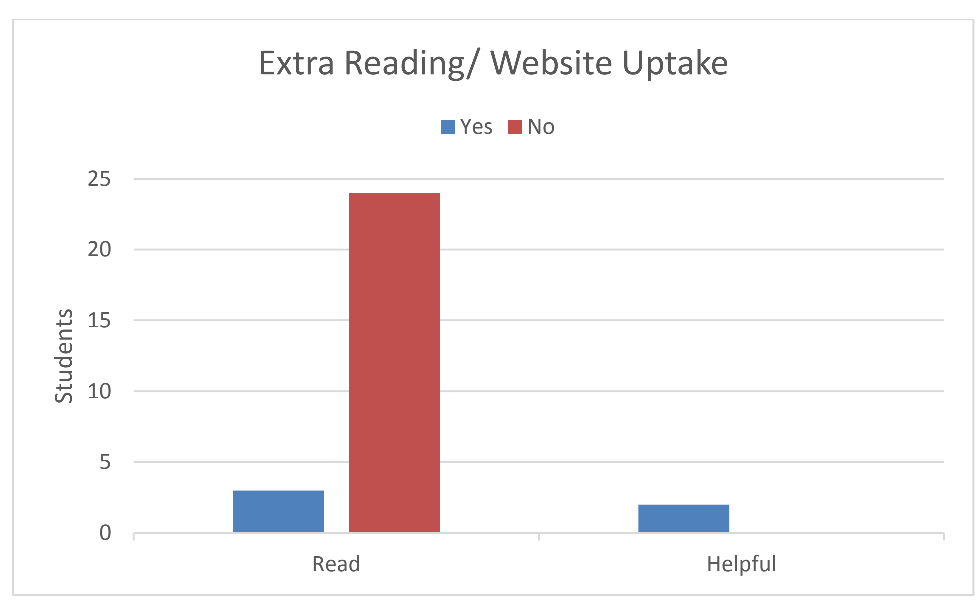

Figure 7 Student response rates to additional readings or viewing websites

4.1.3 Health literacy knowledge

There was a shift recorded in self-reported knowledge around health literacy by the majority of students after clinic attendance compared to prior levels of knowledge (Fig.8). For fifteen students, the shift was showing a greater level of understanding after clinic attendance while for seven students there was a self-reported decrease in knowledge or understanding. A further five students indicated that the readings and clinic had not altered their understanding of adult health literacy in either direction compared to their previous knowledge. Overall, there was a mean positive shift of knowledge reported (from 2.85 before readings and clinic attendance to 3.41 after attending the MHLC). Students were able to indicate where they had received most of their knowledge of health literacy prior to the clinic experience. Previous School of Pharmacy community and hospital placements, external pharmacy engagement such as working in pharmacy settings, patient contact during clinical workshops, conversations with family and pharmacists, School of Pharmacy workshop or lecture content and readings from wider media sources were (in decreasing order) reported as sources of prior learning on health literacy.

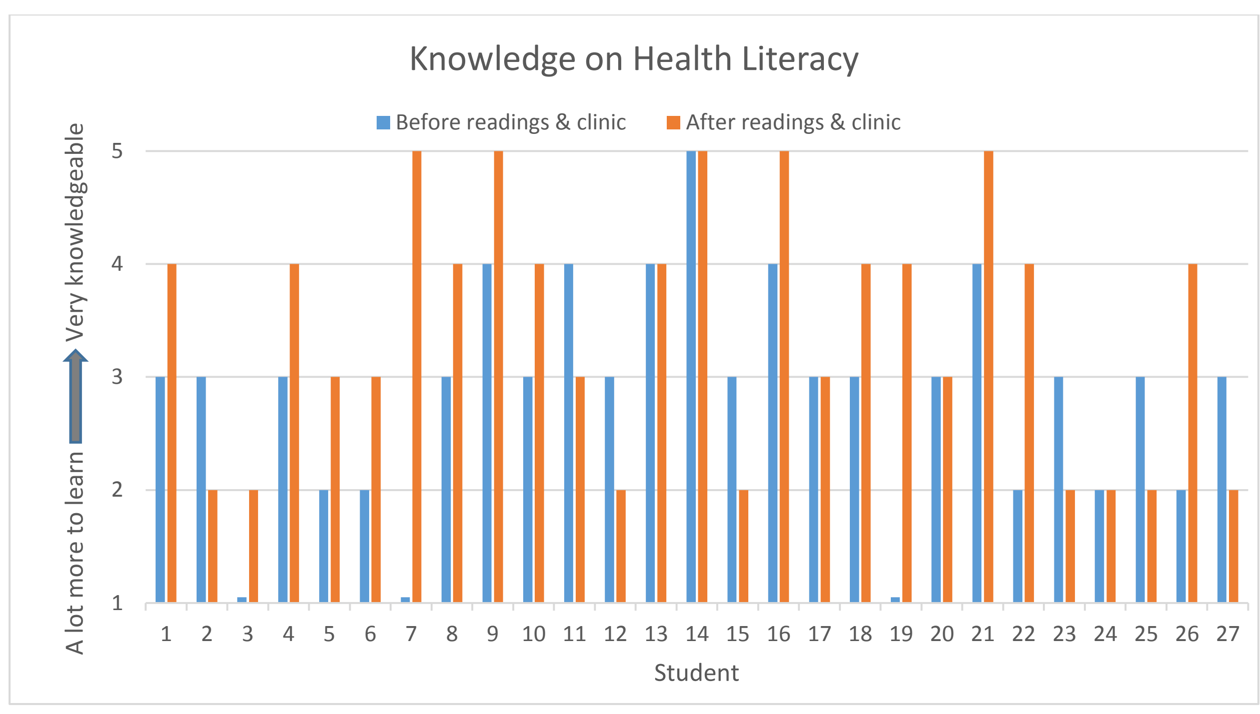

Figure 8 Student responses to knowledge levels on health literacy prior and post clinic attendance

4.1.4 Organisational matters

Students acknowledged clear instructions on the preparatory aspects involved with clinic attendance. Agreement was unanimous amongst respondents for clarity around instructions and procedures in applying to attend the clinic, as well as for being adequately briefed about what they would be doing while in attendance with patients and pharmacists (Fig.9). Only two students indicated instructions were not clear on organisational matters (including communication on pre-readings, clinic venue, times to attend and transport options). Both students elaborated that this was due to receiving late communication for finding and reading pre-clinic resources. One student commented that the distant location of the clinic had caused transportation difficulties for them.

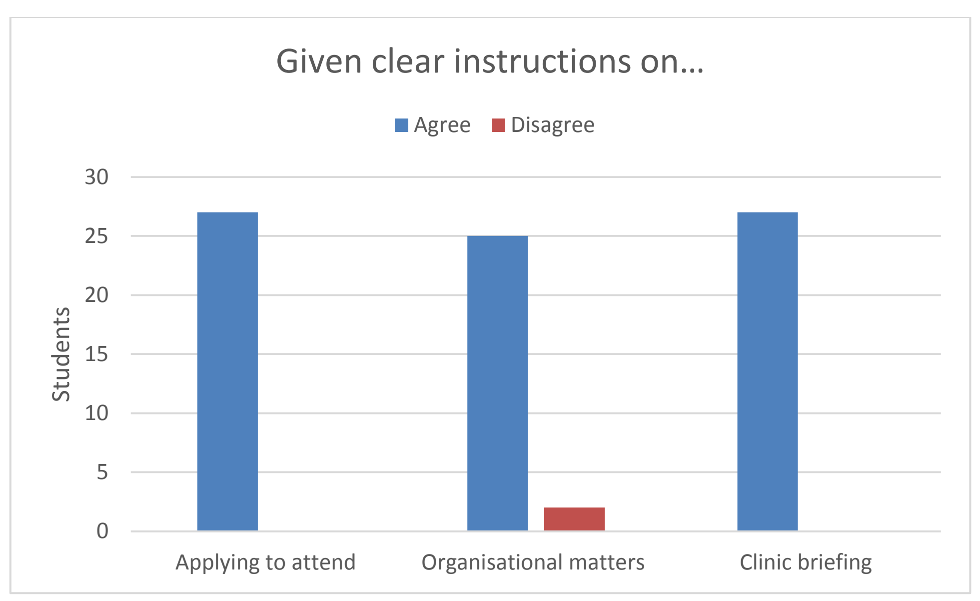

Figure 9 Student responses to clarity of instructions provided by School of Pharmacy

4.1.5 Confidence, contribution and concerns

Students were asked to rate their level of confidence in discussing medication matters with members of the public prior to clinic attendance on a 5 point Likert scale and again indicate such confidence during clinic attendance. Twelve students indicated a moderate level (3) of confidence prior to clinic attendance for which eight of these students reported the same level to have occurred during the clinic (Fig.10). Ten students had reported higher levels of confidence discussing medication matters to the patients in clinic than what they judged their confidence to be prior to the clinic. Three students reported that their confidence levels in discussing medication matters were lower at the clinic compared to prior, and one student considered themselves to be not at all confident both prior to and in attendance at the clinic.

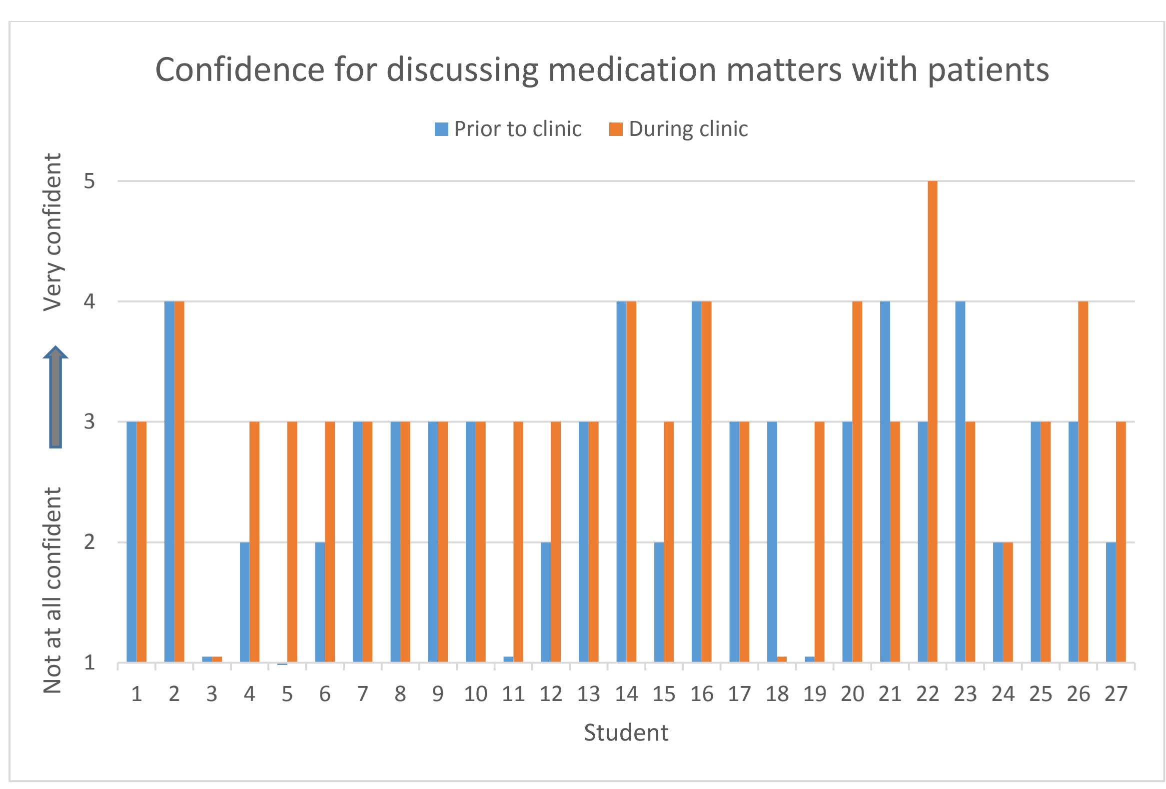

Figure 10 Student responses to level of confidence in patient discussions prior and during clinic

It might be expected that the student's levels of self-confidence in discussion of medicines with patients will change over time spent within the clinic. Students were asked to indicate if such changes occurred. With the exception of three students, the self-reported change that occurred in levels of confidence in talking to patients on medication matters increased over the duration of the clinic (Fig.11). While for two students there was no perceived confidence level shift over the clinic duration, for another two, there was a decrease in confidence.

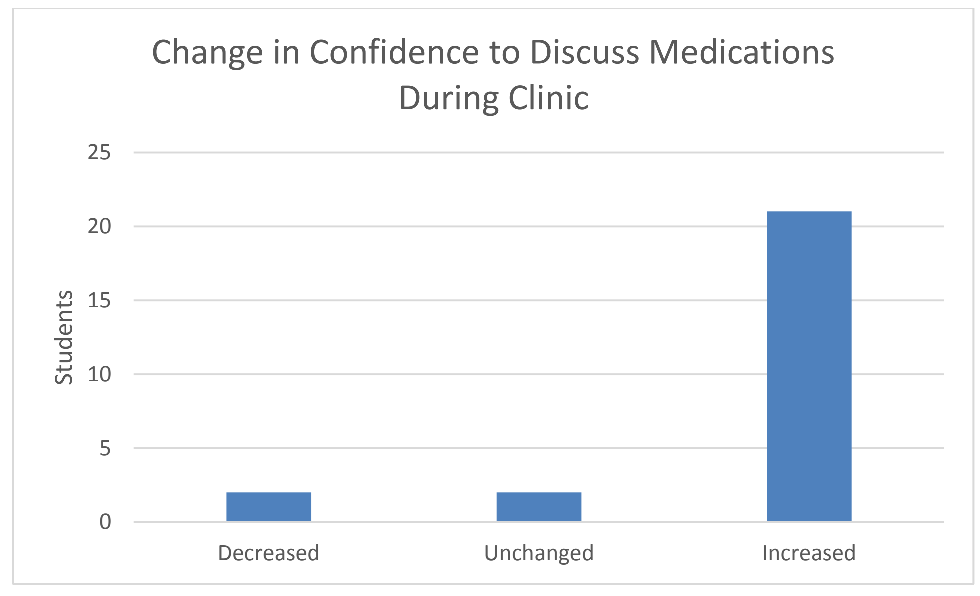

Figure 11 Student responses to confidence change during clinic session

To gauge self-reported contribution into the conversation with patients, students were able to indicate the extent to which they felt they were allowed to contribute and also to what extent they wished to contribute to this conversation to see if there was a close match. The findings show that approximately half the students surveyed indicated they were somewhat able to contribute to the conversation, but only one of these students suggested this level matched their actual desire to contribute (Fig.12). Seven students indicated they felt they were allowed to fully contribute into patient conversations but double this number indicated they wanted to be able to fully contribute. Ten students indicated their contribution level was adequate, matching the number of students indicating that this would be their wish if able to choose the level of contribution to patient conversation.

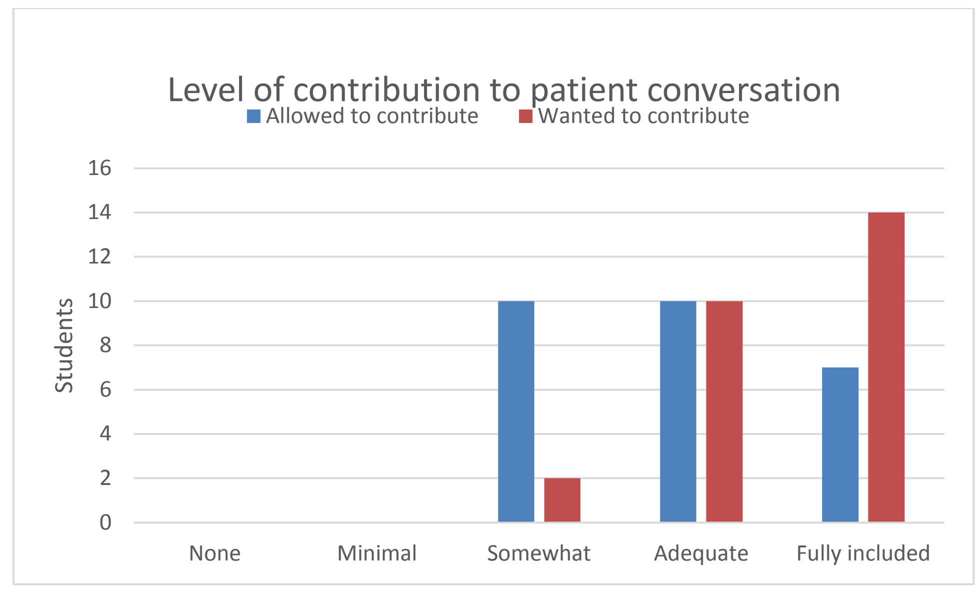

Figure 12 Student responses to allowed and desired level of contribution to patient conversation

It was expected that students may be anxious about various aspects of patient communication and clinical knowledge therefore students were asked to indicate what their greatest concerns were in attending the clinic. Three themes around communication issues were identified as concerning to students (Fig.13):

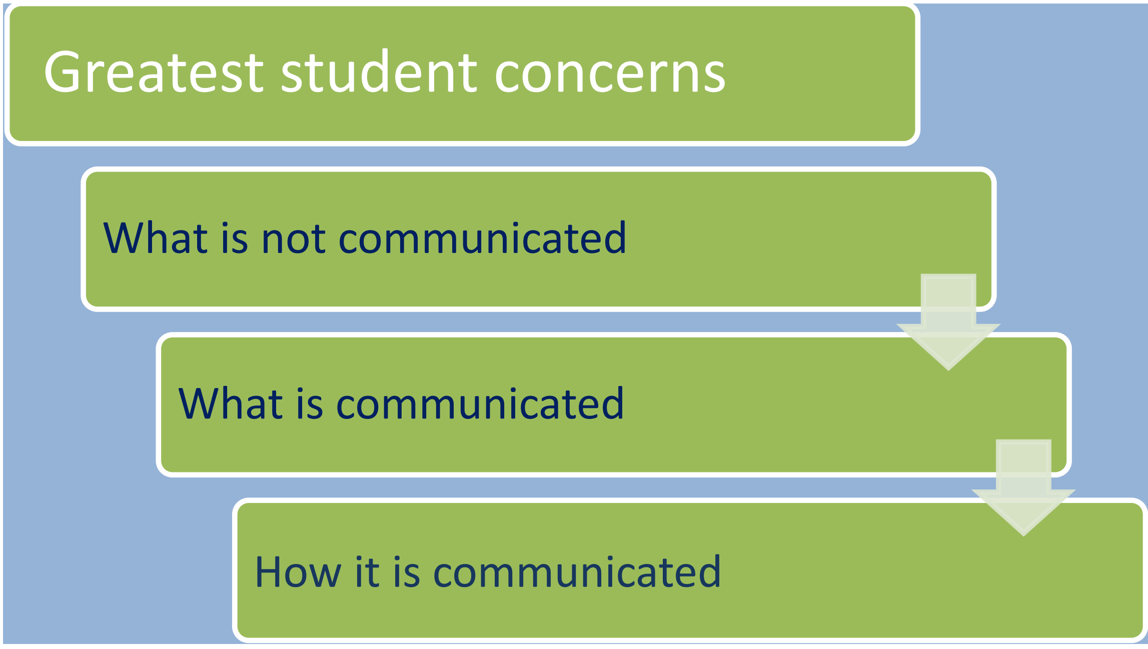

Figure 13 Themes arising from students greatest concerns prior to clinic attendance

1. **What is not communicated**

   Feeling the knowledge they currently have would not be sufficient for the situation was described as the most common concern for almost all students. Therefore students were concerned about their ability to contribute into patient discussion when the extent of their knowledge may be insufficient or they would perceive a weakness in their current knowledge, the extent to which a pharmacist (more so than the patient) may find surprising. Various descriptions of this concern were reported by almost all students.

   - *tricky questions that may be asked,*
   - *lack of knowledge next to supervising pharmacist,*
   - *confidence in own knowledge,*
   - *feeling insecure of knowledge in front of pharmacist.*

2. **What is communicated**

   Students were also providing feedback that they were anxious of what might be said by them in such a patient discussion which could pose problems. Responses included concerns that what they did say may be factually incorrect i.e. fear of saying the wrong thing to the patient linked to display of weak knowledge (in first theme), therefore requiring pharmacist intervention to correct the information to the patient. There was concern shown that the student may become frustrated at not being able to assist the patient with their enquiry given the limits in their current knowledge but can only contribute to some small aspect of the conversation. What they have spoken being off the point, insubstantial or placing an over-emphasis on clinical care that may overtly concern a patient requiring redirection by the pharmacist were also mentioned. Student comments include:

   - *fear of saying the wrong thing to the patient in front of the pharmacist,*
   - *feeling unhelpful,*
   - *feeling insecure about the information being given*

- *saying something minor but patient takes as major serious problem i.e. a rare side effect.*

3. **How it is communicated**

Students had concerns that the information they would be relaying may not be understood by the patient. One reason mentioned by some students was concern in not being understood due to accent or language difficulties. Mostly this was considered to be a student problem in making themselves clear, however one student was concerned they would not understand verbal communication from the patient. Another concern in this theme was that students may not be able to take away medical jargon or technical terms when in discussion, therefore hindering patient understanding. Some students appreciated that a wider conversational set of skills is required in patient discussion and had concerns that they would struggle to engage in wider conversation that may take place. Student comments include:

- *patient not understanding the information I want to deliver,*
- *struggling to explain in lay terms,*
- *confidence in speaking to the patient,*
- *unsure if patient understood my accent,*
- *patient not wanting to listen to you,*
- *lack of conversational material, background chat or small talk.*

Students were able to indicate the extent to which some or all of their initial concerns were allayed/resolved once completing the clinic session. Sixteen of the respondents considered that some concerns they had had were allayed and for a further eight students all their concerns were resolved by the completion of the clinic session (Fig.14). Only three students perceived there to be no resolution of their concerns to any noticeable extent.

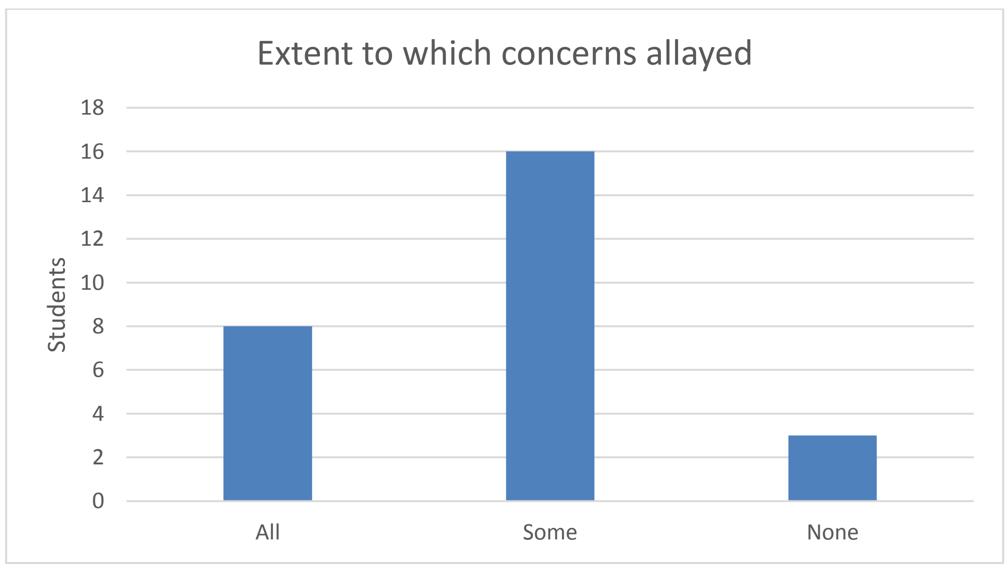

Figure 14 Student responses to extent to which clinic attendance concerns were allayed

4.1.6 Future participation and recommendation

Indication that the students had a positive experience was measured by two questions posed in this survey. The students were asked if they would participate in future clinics. There was a positive response for all the students (Fig.15). The second question for indicating the impact the clinic had on the student was to indicate if they would recommend participation in a MHLC for fellow final year students. Similarly, there was a positive response for all students.

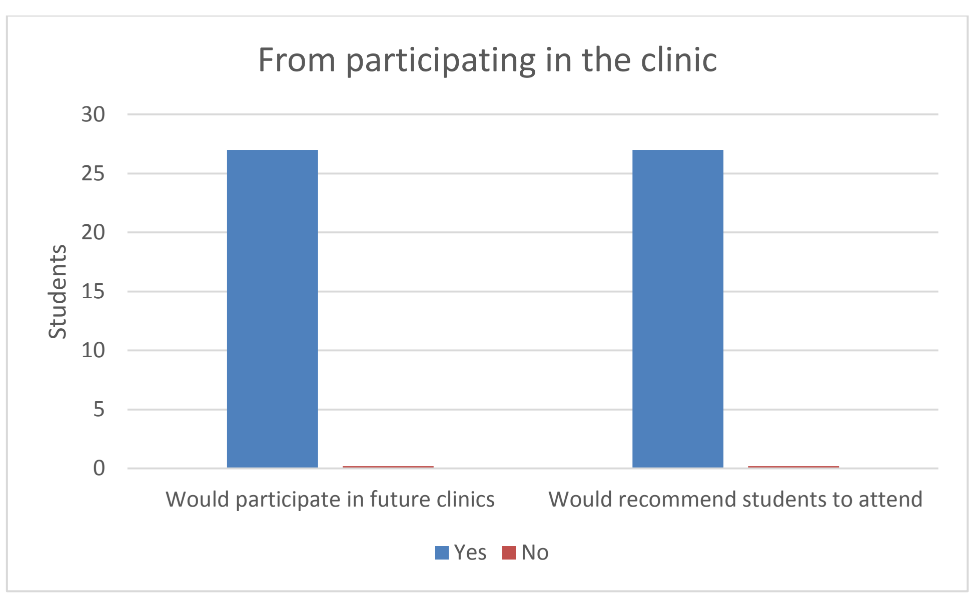

Figure 15 Student responses to future participation and clinic recommendation to peers

4.2 Analysis of student reflection activity

4.2.1 Reasons for patients attendance to clinic

The motivation for the public to attend these clinics was multifactorial but students were clear in their understanding of what the predominant drivers were for individual patients presenting at the clinic. Patient motivation commonly centred on questions they had regarding either specific or a range of medications they were taking. It may have been motivated for a desire to be on fewer medicines and the need to take them; about the medicines use; dose range; ability to take medicines on an 'as required' basis; discussion around unwanted side effects being experienced; or unwanted medical events and whether any medications they take are responsible.

The second patient was an elderly woman who was on an extensive range of around twenty different medications. She had recently experienced three falls in the last four months which was worrying her. She thought this may be due to interactions between medications.

They were unclear about what they were told to do with the medicines and worried if there were any issues of side effects or drug interactions. For example, patients often

take regular prescription medicines and occasionally OTC, herbal and multivitamins and with that, they would like to know whether there were any complications of taking those combinations and wondered if there were any crucial precautions to note after taking multiple medications.

The first patient was an elderly lady who was on multiple medications for hypertension and atrial fibrillation. She enquired about the use of each of her medicine and asked about the purpose of having multiple drugs for high blood pressure.

While not common, several patients had turned up to this clinic without any of the medications, while many had not brought all their medications along with them (e.g. inhalers, angina sprays, supplements). Others had hand-written lists of medicines they were asking about. Many patients had some or limited knowledge of their medicines but had a lot of confusion requiring information to clarify.

Students were able to reflect that patient access was favourable when the service was provided at no cost to the patient and was deemed as being more convenient, with getting advice straight away without appointment or waiting times.

A point to note is that three out of the four patients mentioned that they felt their community pharmacists are too busy to answer their questions. Therefore, found the clinic helpful for that purpose.

4.2.2 "Three steps to better health literacy" used to increase a patient's understanding.

Step one – find out what the patient already knows

Students' replies showed they had observed and participated in various conversations that followed the first step of finding out what the patient already knows. Common techniques reported by students include:

- Asking the patient did they know what the medication is used for?
- Asking the patient why they were on the medication that then may reveal how much information they retained from conversations with their healthcare professionals
- Asking what his/her doctor had told him/her about his/her medications

Some students reported learning occurring in offering the patient prompts to their memory as to what they take the medications for by suggesting possible uses for the medicines when the patients were struggling to remember. Often this would be fruitful to elicit further recall.

Appreciation of the wide range of health literacy levels displayed by various patients was a theme that commonly arose from reflecting on the reasons for patients accessing this clinic. Students were able to link the level of health literacy with differences required in tailoring communication.

I was surprised at the level of understanding some patients had regarding their medications. But also I realized that it's really important to ask them lots of open questions, and not to assume anything e.g. when my first patient said she took her paracetamol three times a day

I might have assumed she was taking them 6 or more hours apart, but she was actually taking them 2 hours apart).

Maybe it was because of the nature of the clinic, I found it quite hard to implement a lot of the questions I had planned previously as according to the suggestions by the booklet. For those that had good health literacy, they were eager to tell us what they know. Whereas for the ones that do not know much about the medication, they were quite dismissive and had troubles expressing themselves.

This step was easy to implement because the patient was a very talkative one. The patient went through his medical history with us in great detail.

We did a good job initially asking him to ***tell us*** *about what his questions were, how long he had had his medications for, what he thought they did and when he should take them. It is essential to first figure out what level of understanding around health the patient has so that then we can build on this knowledge.*

In order to find out what they knew, I found instead of asking them directed questions it was more appropriate to just let them speak and listen carefully, and then we would ask any necessary questions at the end. This enabled the patient to let us know what they thought was important in their case, rather than us asking a list of set questions which may have not been appropriate for the individual patient.

Knowledge gained by patients comes from a multitude of sources including health professionals, family, friends, published material, electronic resources etc. Students appreciated occasions when contrasting opinions and views on treatment approaches caused confusion for patients. That led them to seek a further source of advice provided in the clinic environment.

The patient was also prescribed simvastatin as a prophylactic against severe cardiac conditions however, the patient decided against taking simvastatin because he believed that it was unnecessary based on documentaries and information he read on the Internet.

Step two – building health literacy skills and knowledge

Students reflected on the processes involved with building up patient health literacy around medication usage. Learning occurred around the challenges of providing focused information that would increase patient health literacy.

A theme that emerged from several reflective accounts was dealing with information that patients already held that may have been erroneous and communication techniques employed to correct such misinformation whereby any correction of misinformation was handled without being dismissive or critical of patient beliefs.

Most people come into the pharmacy with existing knowledge about their medicines, even if it is incorrect. As a pharmacist, our role is to deal with that incorrect knowledge, and to try and rectify it.

An important thing was that the patients were not told they were wrong, but were 'suggested' that a better way of thinking or viewing something was what we had stated. This avoided insulting their knowledge, and instead helped teach them information in a more positive way.

Since learning from reading the health literacy information and my last clinic experience that people do not like to be told they are wrong or may feel they cannot ask a question about something. I further developed the way I communicated in the session; e.g. 'it is common for patients to believe…. however…'

If the patient has incorrect assumptions about something they were very careful to correct these without degrading the patient or making them feel stupid.

Reinforcing opportunities to connect back with GPs, pharmacists and allied health professionals where opportunities arose were observed and commented on by several students. Health literacy includes identifying how other health professionals may be able to assist in improving health outcomes.

So we advised them to talk to their GP or local pharmacist next time when they have an appointment and enquire the problem

We answered by saying that we are unsure about this and that it is best to talk to her physiotherapist

Communicating health information often relies on both spoken and written communication. During the clinic, students were able to witness and employ various techniques that aided patient understanding, and then link that information to their medicines. Examples including breaking up the information into smaller, more memorable chunks; handwriting beside the labels to indicated usage; keeping the language simple and clear; taking care to not provide too much or unnecessary information; keeping the medicines linked to the conversation by gesturing back to the physical medicine container. The decision to adopt different modes of communicating information (spoken or written) was dependent on the context of patient interaction with student and pharmacist.

I thought a good way to help retain this knowledge especially after they leave the clinic was to annotate the patient's medicines packaging along with what it is used to treat e.g. for the atorvastatin packaging, we could write on the package "for high cholesterol". In this way, they could go home and refer back to this again just to consolidate.

The questions were all somewhat straight forward and there was no need to write things down or use visual aids etc., however this could be useful strategy – especially if the issue is around timing of doses….

While talking to the patient about his medications we also kept gesturing towards the one we were talking about so he could link the information we were telling him to the medications in front of him.

This clinic will provide students with a wide exposure to numerous medicines, many of which are covered in detail during the training, but others of which are relatively new to them. Students were aware of new learning that occurred around medicines. Opportunities were taken to add or increase their knowledge from active discussion with both patient and pharmacist.

This was an excellent opportunity for us as students to increase our own knowledge as we have heard little about this medicine, especially for use in the context of this patient (altitude

sickness). We were required to use a text book to look up information which we could then give back to the patient. This made it a learning experience for both parties.

Students were able to provide examples throughout their reflection of how the discussion proceeded to clarify patient concerns.

We tried to build his health literacy by explaining to him that it does not really matter which time of day the patient takes his medications (if the label says od) as long as he is taking them at the same time every day.

We educated patients that it is more important to make sure that they take the medicines rather than stressing about when to take it. For example, do not have to take omeprazole 30 min before breakfast if it is really hard and taking certain medicines together at night.

Step three – making sure the patient understood the information

Student reflection showed this part of the communication process was absent in many discussions, present in a few, and somewhat confused in others. When checking for understanding was not reported as being undertaken, students commented it may not have occurred depending on the nature of the problem. Students who did report that they witnessed or conducted a feedback communication process with their patients did not expand as to how such actions were seen to benefit patient recall or understanding, other than a comment to suggest this can be difficult to implement without it feeling like the patients are being given a quiz at the end of their encounter with student and pharmacist.

We would also make sure at the end of it that the patient understood the information by asking them to repeat the information back to us.

One patient was asked to explain her understanding after discussion which was effective but hard to ask without making the whole discussion sound like a test.

Several students discussed how the session wrapped up by the pharmacist or student asking the patient if they had any further questions rather than if there had been any checking of the information that the patient had received and understood. Asking if the patient had further questions, or if they agreed to their suggestions, might not mean the patient fully understood the information being provided which a teach-back technique may reveal.

Both patients agreed to our suggestions which indicated to the pharmacist and I that they understood them

At the end of the session, patients would usually be asked if they have any questions to check whether they did understand the problems and how to solve them.

Often, we were not required to check understanding as the patient would repeat the information back to us in confirmation. It was more of a 'check they understand as we went through the information' rather than asking if the understood at the end. However, I think this was an appropriate method of ensuring understanding. Based on body language and their unprompted repeating of important information, we were led to be confident in our patients new knowledge and health literacy.

I should have asked him to repeat what he already knew to assess his understanding. But, he showed that he understood what I have just said from his response to the assisting pharmacist.

Some students seemed to pick up on lost opportunities to instigate the check-back method into their conversations with patients and were positive about employing these in future encounters.

I did not check whether I had been clear in the information I had given to him, but just reinforced the main points I wanted him to take away at the end of the session. I asked whether he had any other questions, which did not check his understanding of the information I had given. Instead I should have asked him to repeat what I told him about his medications, focusing on the answers to the questions I gave.

Although it seemed like the patient understood what we were saying and was happy with the feedback, checking to see what we had told him was the same as what we heard would have been helpful to make sure he had the right information in his mind.

Next time we could be more obvious about teach back approach asking the patients to show they fully grasped the new health knowledge of skills by getting them to tell us in their own words what we have just explained….

4.2.3 Student reflection for patient outcomes using MHLC.

Students believed that the clinic structure (i.e. free, no appointments, pharmacist-assisted) and the environment (i.e. community centred, sitting down to an informal discussion) were conducive reasons leading to patients attending getting 'something' out of the clinic. That the patients were able to be provided answers for their questions and in general to gain further information about their health from discussions had, were reported positively by many students.

By giving them an opportunity to sit down with a skilled health care professional and two students who are solely there to answer their questions is much different to what they had previously experienced. … This gave them the freedom to ask questions.

In general, the two clinic sessions that I have attended have so far been an eye-opener for me, knowing that polypharmacy is very common and improving health literacy is pivotal to ensure an appropriate and safe use of medicines. Personally, I would say that these clinic sessions did help them not just understand better about their medicines but also encouraging a positive interaction between patients and pharmacists.

Evident from responses were that patients often didn't have adequate time with their health professionals. This clinic gave them freedom to ask questions that they didn't feel like their doctor or pharmacist had time or they were interrupting them. Several students while commenting positively on the learning that occurred for the patient, also raised the advantage of time availability able to be spent with each patient as a factor conducive to fostering better outcomes and that it was appreciated as not-typical of normal health professional encounters in the community.

Overall, I believe that each patient we spoke to gained a better understanding of their medicine and health. Unlike consultations with GPs, there was no perceived time constraint for each patient. We could afford to take time ensuring information was passed on correctly and explore ways to help retaining that knowledge about their health.

I think that these clinics were a really good opportunity for patients to have a more casual discussion about their medications without the pressure to move things along quickly that you can sometimes get in a busy pharmacy.

Several students discussed variations of learning outcomes received by the patient in particular encounters which depended on the particular patient and their reason for attendance. With some patients, there was observation by students that there was not enough information to work on, so no meaningful advice could be offered. For others, the information may have only been confirmatory to that already known by the patient, but the clinic had not necessarily increased the knowledge held.

In terms of the medicines, it would be difficult to judge whether they have benefitted from the clinic. It largely depends on their health literacy level. Some of them were quite literate and they came into the clinic to clarify some mild issues, thus the clinic won't make too much of the difference in improving their knowledge. In contrast to those with low literacy level or unsure about their medicines, the clinic would make a huge difference.

Several students reflected that the patients may be more proactive in accessing this clinic if they were genuinely interested in improving understanding and health outcomes to current experiences they are having with their medicines. The encouragement given to patients to openly talk about their concerns, while acknowledging limits of literacy ability and without being critical of their current level of understanding were bought to the surface in reflective passages.

I felt that the health literacy clinic created a learning environment and therefore, the patient is more open to asking questions without the fear of the question being perceived as a 'dumb' question by the pharmacist.

It was clear that both patients I had talked to had some misunderstandings about their medications, which in the case of paracetamol could have been dangerous to the patient, so it is important to have clinics like these to clear up these sorts of issues.

For some patients, students noted that were clear points of action following clinic attendance gained from a better understanding of their medicines.

Yes, the patient left with a remark that he is really clear about what I have been talking about by rephrasing what I have just said. At least, he now knew what to do if he is experiencing side effects from the medications.

Overall, I feel that the clinic did help the patient to get a better understanding of his medications and health. The questions that he asked were questions that they had said had been on their mind for a while now and they felt good knowing what their options were and were looking forward to discussing them with their doctor.

4.2.4. Student reflection of discussions enhancing health literacy

Student reflection was very positive for learning gained in understanding the levels of patient health literacy. Students were surprised by often low literacy levels and had been made aware of this impact on health decisions or medication issues arising. Student learning came through the interaction established in the discussion with both patient and pharmacist(s) as well as from prior preparation of pre-clinic reading around health literacy. Further discussion opportunities with the pharmacist in post-patient encounters helped students gain critical insight into clinical and literacy reviews.

Quite often we as students were not familiar about health literacy and by having supervising pharmacists, they definitely assisted us how to apply the concepts in clinical context. The supervising pharmacist also required us to prepare for the clinic sessions by reading some articles about health literacy in NZ. This preparation was indeed helpful as the principles were applied during the consultation with the patient.

I felt like I had a reasonable understanding of health literacy and the differing levels of it within the community before attending the clinic. However talking to these patients has really cemented some ideas. I had assumed people attending the clinics would have a basal level of interest about their medicine and be more knowledgeable than the average person. This was not the case however.

Talking to my patient has helped me to see that health literacy does not necessarily mean not knowing what your medications are for and not knowing why you are taking them, but it can also mean that you are not aware of your options or why this specific medication may or not be working for you.

… it helped me to realise how broad health literacy really is and see that it is not confined to a few simple ideas.

It is opened me up to how much people ACTUALLY know about their medicines (e.g. they may appear confident but not really know what their medicines are for)….

Witnessing and participating in patient discussion that allows high contact time between pharmacist and patient was a positive learning opportunity noted by several students. Linking prior learning to both classroom activity and past experiential learning of placements were also commented upon however it was noted by one student that prior preparation for any structure around a clinical conversation may be difficult.

It's also good being able to see first-hand the communications between pharmacist (the supervisor) and a patient as we can pick up these skills and use them in practice.

The information I relayed to the patient was useful revision for myself about the concepts we covered in pharmacy school. Talking to someone in a real life situation helps this information to be retained and can be remembered more easily in the future.

Although you do get opportunities on placement and whilst working to talk to patients, you don't always get to go through all of their medicines in such detail to make sure they really understand.

It was clear that if you over think the types of questions that you are supposed to ask, it would be a hard task, but the supervising pharmacist helped me think of casual, non-formal methods of asking the same questions.

5.0 Discussion

5.1 Student engagement

Final year (Year 4) undergraduate pharmacy students voluntarily participated in each clinic session. Demand to participate for clinics largely depended on the time of year that the clinic occurred within and what else might have been occurring, such as university semester break time, final exam preparation, assessment activities for various papers, timetable clashes with teaching events etc. Often, student availability matched the number that could be accommodated given the desirable ratio of 2 students to each pharmacist and allowing for a few rotations to occur between students. When 2-3 pharmacists were present, it seemed that 6 to 8 students would be optimal numbers to ensure all students received patient contact time.

When in discussion with patients, students who responded to the survey had perceived mostly a 'somewhat' or 'adequate' level of contribution to patient conversation. The wish to contribute into the conversation was either matched by what they had undertaken (if that contribution was greater than 'somewhat'), or the desire was there to increase their contribution to a greater extent. Student engagement may have been greater in some patient consultations compared with others, depending on the nature of the enquiry and literacy level of the particular patient.

While a wish for greater contribution to the conversation was noted from the study, it may not have eventuated past the level of contribution actually achieved given the student responses to the concerns they had in entering the clinic. Contribution to conversation is likely to be diminished if students were concerned that they did not have relevant or in-depth clinical knowledge especially in front of a pharmacist who was also an academic staff member. Student engagement with patients may be reduced when students feel they may communicate incorrect information that could have serious implications if not corrected by the pharmacist, or the ability to be understood where English may not be their first language. Every student surveyed identified such concerns and while the majority reported that during the clinic session these perceived barriers to patient engagement were somewhat allayed, it was common to find that some anxieties had not necessarily been resolved therefore still self-limiting the ideal of full participation versus 'adequate' contributions to conversations with patients. It may be an understandable ideal for students to more fully become involved with patient focused communication in this setting, but limitations and concerns as those noted above by students and staff provide useful points of discussion to negotiate contribution between pharmacist and student.

5.2 Student learning

Student learning would be occurring within a novel placement activity which is patient-centred. The nature of patient discussion is driven by patient interest or concern and

facilitated by a registered pharmacist who will usually also be an academic member of staff. Therefore the learning opportunities will necessarily be situation-specific, often spontaneous and without the usual planning for the experience that the student would normally encounter in past placements in the BPharm undergraduate programme.

While students witnessed and appreciated a wide range of health literacy amongst those accessing the clinic, it was the low levels of health literacy amongst some patients that provided the greatest reflection and learning from students. Students described the need to link the level of health literacy to differences required in tailoring communication and provided examples of patients having trouble expressing themselves. Both Trujillo et.al (2015) and Sicat and Hill (2005) similarly found students had previously underestimated the prevalence of low health literacy in patient populations and that identifying patients with low health literacy and tailoring communication strategies would be essential in improving aspects to patient care.

The *Three steps to better health literacy* tool was accessed, read and acknowledged as being helpful to their understanding of literacy by most students participating in the survey. Pharmacists were attempting to employ this communication tool throughout each patient encounter for which the students participated in during, and reflected on after, the clinic. Students appear overall to have increased their level of knowledge on adult health literacy from their own assessment after the reading(s) and clinic. For most students the gain in knowledge was moderate rather than at the high gain level, and feedback suggested that prior patient experiences through past placements or work experience to have predominantly given some baseline understanding. Some students reassessed their perceived knowledge on health literacy as requiring more to learn after the clinic than they judged of themselves prior to the clinic. This may suggest that students were cognisant that each patient encounter may reveal new challenges or complexities with their health literacy and upon reflection, the student now understands that rather than being knowledgeable overall to a satisfactory level, they were aware of a particular gap in their knowledge where there is more learning to be had.

Students could bring many examples in their reflections demonstrating how learning opportunities presented themselves following the three step approach. Step 1 of finding out what people know is deemed the most important part of the model. Open questions asking the patient why they were on the medications and what other health professionals had spoken about previously helped the tailoring process to communication by finding out what the patient already knew about the topic of discussion.

Step 2 of building people's health literacy to meet their needs showed further learning occurred for students. Students and pharmacists were using this information to decide on the accuracy and level of literacy before adding to the patient's knowledge which may have included the opportunity to correct current understanding. Communication techniques to link information to their medicines were employed by students and pharmacists such as handwriting on the labels, keeping language free of technical terms, moderating the amount of information provided etc. Students were also aware of new learning that added to their own knowledge around clinical matters, new medicines and side effects.

Step 3 – checking the pharmacist was clear had an interesting response from student reflection. This step in the model is often overlooked or the closed question 'Do you have

any questions' as a way of checking is not regarded as a way of checking people have understood (p.17) Students reported in their reflections that these were the final checks put in place to ensure patient understanding. This part of the model therefore caused some to consider this type of question to be linked to patient understanding rather than being challenged that the patient may not have had any further question, but had not necessarily understood what they had been told. The teach-back (or show-me) method is used as an appropriate technique to check for understanding in the 3 step model (p.18) and regarded as one of the easiest ways to close the gap of communication between a health provider and patient (Universal Precautions Toolkit, 2010). Learning may not have occurred for this step if the nature of the enquiry did not lend itself to teach-back but there will be instances that require the pharmacist to change their own habits in order for learning to occur.

5.3 Patient engagement

The individual patient is the most important stakeholder when developing instruction around health literacy education for health professional students in an experiential setting. The nature of the MHLC allows patient empowerment through open and inclusive communication techniques. Informal settings were within open spaces yet conducive to conversational privacy by appropriate separation of consultation spaces. Time allowance for discussion was not fixed and often encouraged patients to have longer conversations around medical histories etc.

While the focus of this report has been on student learning, one of the three main aims of the MHLC was the School of Pharmacy undertaking a valued service-for-no fee to Dunedin residents. Over the course of 11 clinics during the past year, 65 patients plus some supporting whānau have had consultations with academic staff pharmacists and final year students within these environments, therefore averaging 6 patients per clinic.

Most patient interactions were for a health literacy discussion on aspects to their current care, either specifically focused on an individual medicine or problem, or secondly less focused but more an overview on multiple medications, identifying where knowledge could be increased in their current level of understanding. It was rare when the need for a follow-up may have been needed when a pharmacist from the consultation may have been required to contact their patient's regular health care professionals (e.g. pharmacy or GP), but nevertheless this did occur on at least 3 occasions. This expected, but infrequent, event was planned for in this clinic by way of a prior patient consent process and recording of service providers. Patients were happy for clinic pharmacists to follow up matters on their behalf. The clinic provided the opportunity for patient education to make changes in their own management around medicine taking (e.g. timing of administration, taking additional supplements, increasing 'when required' doses of analgesics etc.) and one occasion when followed up, was reported by the patient to have improved her pain control through education around optimizing available analgesia. On occasion, students who were with the patient were further informed of the results of the follow-up.

Patient attendance seemed to increase when advertising coverage was increased in both community and major provincial newspapers. The patient's ability to locate and access the church hall were without difficulty for most while one patient had accessed a local pharmacy for directions for which that pharmacy was knowledgeable of clinic locality and time due to

regular advanced notification to surrounding pharmacies. Patient access proved just as easy in residential care villages where communal lounges housed the clinics.

Patients have not been sought for their feedback regarding reasons for accessing this service, how they heard of the clinic, access issues, and evaluating any outcomes that improve patient understanding or health outcomes. This may be an interesting research opportunity in the future.

5.4 Organisation and management

It is important that procedural responsibilities are clear to all staff involved in running any placement. The instigation, administration and delivery of the clinics has remained within the management of a very small team (named on this report) all of whom attend clinic sessions when available. One report author (JW) has responsibility for student educational delivery and outcomes while another (AP) has responsibility for operational activities including location liaison, student and pharmacist recruitment, transportation and being 'lead' pharmacist during clinic sessions. Staff involved keep in both regular and as needed face-to face meetings and email via an email address site specifically for clinics.

Support continues on a half day per week commitment for an administrator to liaise with University of Otago marketing department (for newspaper advertising), prepare flyers and cover letters that are sent to community pharmacies or retirement villages, and direct correspondence to appropriate staff members.

School-to-student contact regarding the occurrence of clinics and processes of communication to contact the School for registering interest to participate have been commented on favourably by students and the survey data suggests instructions regarding how to apply, details of pre-clinic reading resources to access, clinic venue times and locality, as well as transportation options, appear to be clearly understood under current procedures in place.

Liaison with community pharmacies has been on-going since its inception. A wine and cheese function was hosted at the School of Pharmacy for local Dunedin community pharmacies in March 2014 to specifically discuss School involvement in the community through the clinic. Pharmacists invited were asked for feedback and welcomed to participate. This has been followed by on-going approaches to local community pharmacies advising of the clinic time and locality while also inviting pharmacists to participate. Unfortunately to date there has been no uptake of this offer. To some extent, and understandably, this may be due to busy work practices in pharmacies coinciding with clinic times (usually Friday afternoons) and so not making pharmacists available.

Liaison with a wider pool of registered pharmacists who are employed as clinical academic staff members at the School of Pharmacy to participate in clinics, has been in place through regular emails directly advising them of clinic venue and time, as well as on flyers placed in the lifts of the School of Pharmacy, and frequent announcements on the Pharmacy School electronic newsletter. Several staff have shown an interest in the clinic through discussion and further email enquiry however it seems common problems arise in conflicting engagements with teaching and research. The holding of part time positions at the University when scheduled clinic days occur when staff are away also pose difficulties.

6.0 Study limitations

The authors to this report acknowledge certain limitations exist regarding aspects to the study design and analysis made from it.

The cohort attending the clinic is approximately 25% of the final year class total, of which even fewer students had participated in the survey being conducted. Students in two different years (2014 and 2015) participated. Generalisations to the complete final year classes for either year or wider still to other health professional training providers may be inappropriate. No attempt has been made to offer statistical significance to any quantitative data due to low power of this study and likelihood of over-estimating effect sizes.

Smaller number of students participated in the Exit Survey than was expected. The students who had taken away to complete the survey were often lost on follow-up. It should be further encouraged that all students be allowed time to read and sign the consent form (if they chose to participate) and complete the paper survey before requiring them to depart from the placement.

To date, this pilot study has focused on student learning and has not attempted to measure patient satisfaction, changes in patient knowledge, or any direct health outcome changes. These will become important determinants of reporting success or otherwise in delivery of key performance indicators when reporting to future stakeholders and to publish internationally.

The ability of patients to access the MHLC only one afternoon per month, without appointment and within defined localities such as residential aged care facilities or church halls, means there has been an inability to guarantee a regular patient influx. Similar problems of attendance have arisen for academic tutors and students to attend making optimal human resource allocation problematic. Given this is a pilot project, these issues are both a limitation and explanation for which alternative clinic structures may address in the future.

7.0 Future directions

An initial period of twelve months has now come up for which this report serves also as a review of the outcomes achieved and future directions that should be explored.

7.1 MHLC- New achievements and dissemination

Typical of new ventures, the success or otherwise of novel teaching methods is carried along on the enthusiasm and commitment of a few academic staff, all of whom needed to find additional time within their current roles. The success of this programme to add to the placement opportunities that undergraduate pharmacy students can experience and will in likelihood continue due to growing needs of experiential placements.

The MHLC has been able to demonstrate the following ‘firsts’ for the School of Pharmacy

1. Created the first opportunity for the School of Pharmacy to contribute a patient-centred service within the greater community that it has been part of for over fifty years.
2. Provided an educationally driven service to improve health literacy and medicines information to the general public who can freely access this service without waiting or making appointments.
3. Addressing growing demands that all health professionals identify the impact health literacy has on the public and address the responsibility to train the health workforce (including undergraduates) to improve health outcomes using evidenced based methods.
4. Provided a new placement learning opportunity to over a quarter of the final year class each year.
5. Provided student experiential learning on health literacy, patient communication and clinical reasoning in a safe environment with professional guidance.
6. Provided the opportunity for registered pharmacists who hold academic appointments within the School of Pharmacy to continue their professional development and competency in attending these clinics without working externally to the University.
7. Provided, for the first time, the opportunity for final year students to engage with academic staff in a professional setting where situated learning will take place by observation and participation under staff guidance.

The MHLC and its outcomes have been disseminated as widely as possible over a 12 month period in local newspaper and television sources, the leading New Zealand pharmacy magazine, and conferences in New Zealand and Italy. (Refer to Appendix Six: MHCL Dissemination June 2014-July 2015). One clinic has been attended by the President of the Pharmaceutical Society of New Zealand.

7.2 Impact on practice

The HLMC has had the following impact on the community:

1. Improved health literacy for many patients accessing this clinic through 3 step health literacy tool as measured by feedback from the patients, observation by pharmacists, reporting in survey instrument and reflection by learners.
2. Improved health outcomes to several patients through education in optimising medicines directly in the clinic or as a result of follow-up work with patient feedback.
3. Attempted to address a previously unknown demand for opportunities within the community to contribute to health outcomes by improvement in health literacy as evidenced by clinic attendance of 65 patients over 11 clinics.
4. No adverse communication events have been reported from sessions conducted thus far.

7.3 Impact on learners

The HMLC has had the following impact on final year pharmacy students attending:

1. The School has been able to place approximately a quarter of all final year students into the MHLC over a period of one year. Requests to voluntarily participate in each clinic have either matched or exceeded availability of student places. Whilst students may not access each clinic they apply for, the majority will attend at least one MHLC over the year.
2. Most students read the 3 steps to better health literacy as a resource and found this helpful to their learning (survey data).
3. Most students gained knowledge around adult health literacy having undertaken readings then attended the HMLC compared with prior knowledge. Some students who reported a decline in knowledge levels after attending HMLC compared to before, realised they may have over-estimated prior knowledge (survey data). In this case the HMLC provided a framework for the students to reflect on their prior and current awareness and skills in health literacy.
4. Student learning occurred in implementing the 3 steps to better health literacy approach, appreciating the variation of health literacy with which patients present and the need to both build up and help correct aspects to patient knowledge of their medicines (student reflection).
5. Students demonstrated moderate confidence levels discussing medication matters with patients. For a majority of students confidence levels around patient discussion had not changed from what they had estimated their confidence to be prior to attending the clinic (survey data).
6. A large majority of students reported that their self-confidence in communicating directly to patients during the HMLC had increased (survey data). Students' fears/concerns in attending clinics were identified and the vast majority of concerns were positively addressed during the clinic session. Three major themes relating to student concerns were identified for types of concerns the students had. Firstly, feeling insecure about prior knowledge to an extent that this inhibited communication with the patient. Secondly, concerns about the quality of the information. Thirdly, concerns about his/her ability to communicate the information to the patient (survey data).
7. Students perceived varying levels of contribution to patient conversations mostly being adequate or fully inclusive, however they indicated a greater desire to contribute more fully to patient conversation (survey data).
8. All students wished to further participate in future clinics and similarly would recommend other students attend a MHLC (survey data)
9. Students received unique and valuable clinical tuition from academic pharmacists over the clinic time, felt supported in their own conversations with the patients, and appreciated discussions drawing connections made from classroom learning to their patient experience (student reflections).
10. Student could appreciate academic staff members, that are pharmacists, can contribute directly to patient care in this placement experience.

7.4 Impact on the team

The HMLC has had the following impact on academic staff members that attend and manage the placement:

1. Provided a chance to share clinical knowledge from past teaching, research and practice experience to both patients and students in a new forum that encourages three-way learning opportunities.
2. Created an opportunity to provide direct and immediate positive health outcomes to patients in the local community.
3. Allowed the opportunity to formalise staff member's own learning objectives around adult health literacy for their own continuing professional development that contributes to registration requirements for the Pharmacy Council of New Zealand.
4. Opportunities to bring back these experiences into the class room.
5. An opportunity for further engagement of some patients into the "friends of the pharmacy school" programme for future education sessions with students.
6. Some patients have indicated a willingness to further contribute to the School's teaching programme back in the classroom setting, so these clinics have provided a new opportunity to have further engagement with patients over a longer time frame and will benefit greater numbers of students and staff.
7. Contributing roles for team members are both clearly defined and supportive in respect of administrative, clinical and educational responsibilities.

7.5 Recommendations for providing additional student and staff support

1. The School of Pharmacy should consider offering structured training to academic tutors who will be participating in MHLC, on adult health literacy training. This provides the opportunity to reduce variations of tutor instructional guidance and provide greater coherent experiences for students.
2. Consideration of buddying a third year student with a fourth year student when attending MHLC. This will allow senior students to teach their student peers, which is an uncommon but valuable teaching experience. Creating greater opportunities to engage in patient contact experiences will then benefit third year students when they will become the buddy for students in the following year.
3. A review in the programme should be considered where earlier patient contact opportunities can be identified. Early and greater patient contact opportunities allow for students to become more confident in many aspects of knowledge and communication for which will greatly complement skills brought into the MHLC.
4. The timetabled teaching events currently set for final year students are considerable in terms of classroom activities. Currently little flexibility for opportunities to engage in non-scheduled or extra-curricular learning exists. Students and staff who may wish to participate may find timetable schedules prohibitive to inclusion. A curriculum review is currently underway and this is a matter that will be raised directly by members of the team, some of whom have leadership in this review process.

7.6 Further opportunities for MHLC in the community

1. It is intended that the MHLC will continue to be held on a monthly basis either in a community hall setting or within a residential retirement village. We believe these clinics have addressed the 3 core reasons that underpinned their inception. In addition, they have also provided an opportunity for our students to engage in voluntary activities that help their community.

2. The management team conduct regular meetings to determine sites to hold future clinics. In July 2015 a clinic was conducted at a Mosgiel retirement village which has been very receptive to this opportunity. Other retirement villages within the greater Dunedin area have been identified and are at various stages of having approaches made to them.
3. While the South Dunedin church hall has worked well as a venue and will continue to be used, other community localities are being identified especially in North Dunedin where possible MHLC's may be conducted in the future.
4. An additional setting to a community situated MHLC is being considered whereby patients will access this service within the University. It would be expected that appointments (block or episodic timetabling) would be made which would allow staff to be efficient with time management and flexibility around current teaching and research responsibilities. Being located on campus may also allow greater availability of students and easier access to resources. These would not replace clinics in local communities but will provide an additional opportunity for patients to attend clinics from outside of the local regions.
5. A local community pharmacy is wishing to conduct a MHLC within their own premises. The 2015 date is yet to be determined and the School is offering assistance with staff and students. This interest was led by a current pharmacy intern employed at this locality, who had attended a MHLC clinic in 2014 as a final year student. This is very encouraging as it is the School's wish to encourage uptake of this service within community pharmacy. Student exposure in current MHLC could be very useful for future uptake into pharmacies throughout the country as new graduates transfer learning into workplace settings.
6. Ultimately it is anticipated that all final year students will have an opportunity to attend at least one MHLC once logistical challenges have been overcome.

7.7 Challenges ahead

1. **Timetabling**. Timetabling clinic sessions that allow for optimal patient attendance at the same time as students can make themselves available from normal curriculum activities. A full curriculum review of the BPharm programme is currently being undertaken and it is expected that this will result in greater flexibility in the programme which should aid MHLC clinic opportunities.
2. **Staff involvement**. Increasing academic staff involvement. While each month relevant academic staff who hold annual practicing certificates (APCs) are notified by email of clinic session times and localities, the offer to participate has not been taken up for numerous reasons. Some relate around teaching and research schedule clashes, others are part time and do not work at the University on the scheduled day. Again it appears that greater flexibility in the way the clinics are managed should provide more opportunity for staff.
3. **Patient availability**. Logistic balances between ratios of patients, academic pharmacists and students attending to optimize learning is ongoing and unlikely to be further refined whilst working within the community. Free and accessible clinics held once a month during a fixed time in the community or retirement centres create unpredictable uptake by patients. This may be partly accommodated by the additional introduction of a booked time clinic. However we also believe that uptake

will improve and become more predictable as the clinic becomes more recognized within the community.

4. **Other clinic opportunities**. The School is actively investigating other clinic opportunities and has recently explored the possibility of running MHLC activities in adjunct to some nurse lead community clinics.
5. **Funding**. While the School is keen to continue to run complimentary clinics we believe that these should be funded by the DHB. This is an important service for the community and is especially important in those communities where travel to health care centres is either prohibitive on the basis of cost or lack of available transport. Ultimately the School will not be able to sustain a dramatic increase in clinic opportunities without additional support.

Figure 16 Students keen to work with patients to increase patient health literacy

I think it is a great experience and I'm impressed by the idea of organizing a clinic that can help people out.

I think this is a really good programme. Through the interaction with the pharmacists, I strongly believe it will help patients to know their medicines better. I hope I can join again next time.

8.0 References

Health Literacy Universal Precautions Toolkit, Second Edition.(2015). Rockville,MD: Agency for Healthcare Research and Quality. [online]. URL: http://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/literacy-toolkit/healthlittoolkit2.pdf (accessed 22/6/15).

Health Quality & Safety Commission New Zealand. (2013). *Three Steps to Better Health literacy.* [online]. URL: http://www.healthliteracy.org.nz/wp-content/uploads/2013/11/Health-literacy-information-booklet.pdf (accessed 26/06/15).

Kessels, R. (2003). Patients' memory for medical information. *Journal of the Royal Society of Medicine*.96: 219-222.

Loftus, S. & Higgs, J. (2005). Reconceptualising problem-based learning in a Vygotskian framework. *Focus on Health Professional Education: A Multidisciplinary Journal*. Vol 7 (1): 1-14.

Ministry of Education (2006). The Adult Literacy and Life Skills (ALL) Survey: Overview and International Comparisons. Satherley, P., Lawes, E, & Sok, S. Ministry of Education. Wellington, New Zealand [online]. URL: http://ala.asn.au/public/docs/report/ALL_Overview_V2.pdf (accessed 23/6/15)

Ministry of Health (2008*). DHB Maps and Background Information from the Atlas of Socioeconomic Deprivation in New Zealand NZDep2006*. Wellington: Ministry of Health [online]. URL: http://www.health.govt.nz/publication/dhb-maps-and-background-information-atlas-socioeconomic-deprivation-new-zealand-nzdep2006 (accessed 9/10/15).

Ministry of Health. (2010). *Kōrero Mārama: Health Literacy and Māori.* Wellington: Ministry of Health. [online]. URL: http://www.health.govt.nz/system/files/documents/publications/korero-marama.pdf (accessed 23/6/15).

New Zealand College of Pharmacists. (2013). *Increasing your patients medication adherence: a 'how to' guide for New Zealand pharmacy.* Wellington. New Zealand.

Pearce, K., Birbeck, D., & May, E. (2011). The use of animations and the 'teach-back' technique to facilitate an understanding of health literacy levels within the general community. Ergo. Vol 3(2) 39-45.

Pharmacy Council of New Zealand. (2015).*Competence Standards for the Pharmacy Profession*. [online]. URL: http://www.pharmacycouncil.org.nz/cms_show_download.php?id=501 (accessed 26/6/15).

Pharmacy Council of New Zealand. (2014) Workforce Demographics as at 30 June 2014. [online]. URL: http://www.pharmacycouncil.org.nz/cms_show_download.php?id=491 (accessed 14/7/15).

Reid, S.(2014). *Health literacy: a one hour learning bite*. Audioconference material. Pharmaceutical Society of New Zealand (August, 2014).

Reid, S. & White, C. (2012). Understanding health literacy. *Best Practice Journal New Zealand*. 45: 4-7.

Sicat, B. & Hill, L. (2005). Enhancing student knowledge about the prevalence and consequences of low health literacy. American journal of Pharmaceutical education. 69,1-5: 460-466.

Tertiary Education Commission. 2008. *Literacy, Language and Numeracy Action Plan 2008−2012*. Wellington: Tertiary Education Commission.

Trujillo,J. & Figler,T. (2015). Teaching and learning health literacy in a doctor of pharmacy program. *American Journal of Pharmaceutical education.* 79 (2) Article 27: 1-9.

Workbase. (2013). *Literature review of health literacy education, training tools and resources for health providers.* Wellington: Health Quality & Safety Commission New Zealand.

9.0 Appendices

Appendix One: Student resource list

There is a huge amount of information available regarding health literacy. The following are some examples:

BPAC article:

http://www.bpac.org.nz/BPJ/2012/August/upfront.aspx

Health Quality and Safety Commission New Zealand – several resources, available at:

http://www.hqsc.govt.nz/our-programmes/consumer-engagement/work-streams/health-literacy/

HQSC NZ Health literacy booklet:

http://www.hqsc.govt.nz/assets/Consumer-Engagement/Resources/health-literacy-booklet-Sep-2013.pdf

Health literacy literature review:

http://www.hqsc.govt.nz/our-programmes/consumer-engagement/publications-and-resources/publication/835/

Workbase:

http://www.healthliteracy.org.nz/about-health-literacy/about-health-literacy/

Ministry of Health, Kōrero Mārama:

http://www.health.govt.nz/system/files/documents/publications/korero-marama.pdf

Appendix Two: Medicine and health literacy clinic reflection exercise

Medicines and Health Literacy Clinic Reflection Exercise

This reflection exercise relates to your experience at the recent Medicines and Health Literacy Clinic you attended. For this exercise, please write 1-2 pages, addressing the following four points:

1. **What were the patients' reasons for attending the clinic?**
2. **Using points drawn from "Three steps to better health literacy"* (refer to Blackboard PHCY472 clinics), discuss how these steps were (or could have been) implemented to increase the patient(s) understanding of their medicines in this clinic environment.**
3. **Do you think the clinic helped the patient gain a better understanding of their medicines and health? Please explain.**
4. **Discuss how talking to your patient(s) and the supervising pharmacist has helped you further understand concepts of adult health literacy.**

Please submit this exercise to the Undergraduate Administrator as normal, using the School's standard cover sheet within 10 days of attending the clinic.

Ensure your work is named and your student ID number is included.

If you have consented to participate in this project, the submission of this exercise will form part of the data collected for the study, and will be de-identified before publication of any results to preserve anonymity.

Please note that this exercise will **NOT** accrue course marks.

*Health Quality & Safety Commission New Zealand.

Appendix Three: Student information and consenting form

STUDENT'S PERCEPTIONS OF MEDICINE AND HEALTH LITERACY CLINICS AS A PLACEMENT OPPORTUNITY
INFORMATION SHEET FOR PARTICIPANTS or PARENTS I GUARDIANS ETC.

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. If you decide not to take part there will be no disadvantage to you and we thank you for considering our request.

What is the Aim of the Project?

The aim of this study is to determine your perceptions and opinions of the clinics as a placement opportunity, and how participating in the clinic has impacted on your awareness of adult health literacy in the community.

What Types of Participants are being sought?

Fourth year Bachelor of Pharmacy students.

What will Participants be asked to do?

Should you agree to take part in this project, you will be asked to take part in a written survey of your perceptions about participating in a Medicine and Health Literacy Clinic. We estimate that this survey will take less than 10 minutes.

You will also be asked to complete the Medicines and Health Literacy Clinic Reflection Exercise. This is a requirement of attending this clinic, independent of this study; however consenting to this study allows inclusion of data from this activity.

Please be aware that you may decide not to take part in the project without any disadvantage to yourself.

What Data or Information will be collected and what use will be made of it?

Perceptions of the participants of the Medicine and Health Literacy clinics will be collected by 1) a written survey format, and 2) Reflection Exercise, Background demographic information including gender, ethnicity, residency and citizenship status of each participant will be gathered from the University of Otago eVision management system. No identifying details other than the student identification number will be retained. This number will be used for consent and tracking purposes to assess whether a student may have attended more than 1 clinic over the period of the study. Student identification numbers will be removed from the results of the study to preserve anonymity. Information collected will be used for quality assurance for the clinic programme, and also for future publication and dissemination to relevant stakeholders.

The data collected will be securely stored in such a way that only those mentioned below will be able to gain access to it. Data obtained as a result of the research will be retained for at least 5 years in secure storage. Any personal information held on the participants may be destroyed at the completion of the research even though the data derived from the research will, in most cases, be kept for much longer or possibly indefinitely.

Can Participants change their mind and withdraw from the project?

You may withdraw from participation in the project at any time and without any disadvantage to yourself

What if Participants have any Questions?

If you have any questions about our project, either now or in the future, please feel free to contact either:-

(NAMES REMOVED)

This study has been approved by the Department stated above. However, if you have any concerns about the ethical conduct of the research you may contact the University of Otago Human Ethics Committee through the Human Ethics Committee Administrator (ph. 03 479-8256). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.

Students' Perceptions of Medicine and Health Literacy Clinics as a Placement Opportunity
CONSENT FORM FOR
PARTICIPANTS

I have read the Information Sheet concerning this project and understand what it is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

I know that:-

1. My participation in the project is entirely voluntary;

2. I am free to withdraw from the project at any time without any disadvantage;

3. Personal identifying information will be destroyed at the conclusion of the project but any raw data on which the results of the project depend will be retained in secure storage for at least five years;

4. The results of the project may be published and will be available in the University of Otago Library (Dunedin, New Zealand) but every attempt will be made to preserve my anonymity.

I agree to take part in this project.

....
(Signature of participant) (Date)

....
(Printed Name)

[The advertisement which will be used to recruit participants should be attached to the application for ethical approval. This template can be used to develop the advertisement. Please ensure the standard of the written material is of the highest quality, with correct spelling and grammar. You may wish to include an image to increase your advertisement's appeal.

Please note: The University's Marketing and Communications Division encourages researchers to contact them regarding the printing of advertisements once the application and the advertisement are approved by the Human Ethics Committee. Please contact: Ryan Helliwell, Advertising Co-ordinator, Marketing Services, Phone: 03 479 8463 Email: ryan.helliwell@otago.ac.nz]

Appendix Four: Student exit survey

Student Exit Survey from Medicines and Health Literacy Clinic

Thank you for agreeing to participate in this survey, for which you have given your consent and have read the information sheet. There is no course assessment related to this material. Data will be anonymised when extracting any information for either quality assurance or material to be used for future publishing.

Student ID number: ____________________

Please indicate your responses by ticking the relevant box or writing your answer in the space provided:

1. Upon selection to attend, I was given sufficient time to be able read some background material on blackboard prior to attending this clinic?
   - ☐ Yes, there was sufficient time
   - ☐ Somewhat, but limited because?______________________
   - ☐ No, it was not sufficient because?_________________________

2. I read the "Three steps to better health literacy" article from the Blackboard link and found it helped my understanding.
   a. **Read**: ☐ yes ☐ no
   b. **Helpful**: ☐ yes ☐ no
   Comment________________________________

3. I read some of the articles listed as links under "Resources for Health Literacy" on the Blackboard site and found they helped my understanding.
   a. **Read**: ☐ yes ☐ no
   b. **Helpful**: ☐ yes ☐ no
   c. **Which ones were helpful?**_________________________________

4. I further read articles or viewed clips on other web sites regarding health literacy prior to this clinic.
   a. **Read/viewed other sites:** ☐ yes ☐ no
   b. **Helpful:** ☐ yes ☐ no
   c. **Which ones would you recommend others view** __________________________

5. How would you rate your knowledge/understanding around adult health literacy issues **prior** to pre-readings and clinic attendance (please circle)?

   1 2 3 4 5

   Very knowledgeable → A lot more to learn

6. How would you rate your knowledge/understanding around adult health literacy issues **following** pre-readings, clinic attendance and reflection writing (please circle)?

   1 2 3 4 5

   Very knowledgeable → A lot more to learn

7. Where has your knowledge around health literacy issues mostly come from until this opportunity?

   ____

8. I found the instructions and procedures in applying to attend for this clinic clear and easy to follow?
   - ☐ Agree
   - ☐ Disagree

   Comments/ Improvement suggestions________________________________

9. I was given clear instructions on organisational matters required in attending this clinic (including communications on pre-readings, clinic venue, times to attend and transport options)
   - ☐ Agree
   - ☐ Disagree

   Comments/ Improvement suggestions___________________________________

10. On first attending this clinic I was adequately briefed about what I would be doing while sitting in with members of the public and pharmacists.
    - ☐ Agree
    - ☐ Disagree

    Comments/Improvement suggestions______________________________________

11. How would you rate your level of confidence in discussing medication matters with members of the public **prior** to clinic attendance (please circle)?

1	2	3	4	5
Very confident	→	→	→	Not at all confident

12. How would you rate your confidence in discussing medication matters with members of the public **during** clinic attendance (please tick one from **each** group list)?

List A (Level of confidence at clinic)	**List B (Change during clinic time)**
☐ Not confident	☐ Decreased confidence
☐ Somewhat confident	☐ Confidence unchanged
☐ Confident	☐ Increased confidence
☐ Very confident	

13. To what level were you allowed to contribute into the conversation with your patient?

☐	☐	☐	☐	☐
None	Minimal	Somewhat	Adequate	Fully included

14. To what level did you **want** to contribute into the conversation with your patient?

☐	☐	☐	☐	☐
None	Minimal	Somewhat	Adequate	Fully included

15. What were your greatest concerns about attending this clinic? (e.g. confidence in speaking to patients, tricky questions might be asked, feeling insecure of knowledge in front of pharmacists etc.)
    a. ____________________________________
    b. ____________________________________
    c. _____________________________________
    d. _____________________________________

16. Once completing this clinic session were some/all of those concerns from Question 14 resolved/allayed?
    - ☐ All
    - ☐ Some (e.g. a & c)_______________________________________
    - ☐ None in particular

17. Was there an opportunity for a de-brief from your pharmacist following your patient visit and was this helpful to you?
    - ☐ Yes, we had a debrief

    Helpful? ____

    - ☐ No we did not have a de-brief

18. Having experienced this clinic, would you like to participate in another one this year?
    - ☐ Yes
    - ☐ No

    Reason ____

19. Having experienced this clinic, would you recommend other final year students attend one of these sessions?
    - ☐ Yes
    - ☐ No

    Any other comments?

Appendix Five: Patient consent form

What is a medicine and health literacy clinic?

This is a free clinic that aims to provide information to you about your medicines. The clinic is staffed by qualified pharmacists.

All you are required to do is bring your medicines to the clinic.

Please ask questions. The staff are here to help you. Your confidentiality is assured.

Student involvement

The Medicines and Health Literacy Clinic will also be staffed by Pharmacy Students. These students will normally be in their 3rd or 4th year of training. They will always be supervised by a qualified pharmacist.

Referral

On occasion a situation may arise where one of the qualified pharmacists believes that you may be experiencing a side effect of a medicine or combination of medicines. In this case you will be referred back to your community pharmacy or general practitioner.

To help in this process you can provide the name and contact details of your community pharmacy and general practitioner. This is optional.

Community Pharmacy: ______________________________

General Practitioner: ______________________________ Practice: ______________________

Signed: ______________________________ Date: ______________________

Name: ______________________________

Activities

☐ Health Literacy discussion

☐ Referral

If referral – notes:

Signed: ______________________________ Date:_________________

Name: ______________________________

Appendix Six: MHLC Dissemination June 2014 –July 2015

International Conference:

Walk in clinics – a novel way to teach students about health literacy, patient interactions and citizenship. Braund,R., Duffull,S., Peterson,A.,Windle,J. *Monash Pharmacy Education Symposium,* Prato,Italy. 5-8 July, 2015.

National Colloquium:

Medicines Clinic- a novel learning opportunity from the School of Pharmacy, university of Otago. Windle, J., Peterson, A., Duffull,S. *Ako Aotearoa Southern Hub Projects in Progress Colloquium II*, Christchurch, New Zealand. 21 November 2014.

Newspaper Report:

Chance for public to talk medicines. Samantha McPherson. *The Star.* 14 August 2014.

Television Report:

39 Dunedin News – http://vodcast.ch9.co.nz/ch9news/ch9news-20140926-Fri-26Sep2014-1900.mp4 26 September 2014. 26 September 2014.

National Pharmacy Magazine Publications:

Schools give back to the community. *Pharmacy Today*. June 2014. p.18

Medicines clinic a powerful learning tool. *Pharmacy Today.* July 2015. p.22.